



## An updated list of butterfly (Lepidoptera, Rhopalocera) fauna of Tadoba National Park, Chandrapur, Maharashtra, Central India

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**ABSTRACT.** The present study was carried out to reveal the checklist of butterfly species in the Tadoba National Park, Chandrapur area of 623 sq. km. Study was carried out from 2011 to 2021. A total of 134 species were recorded, with an addition of 27 new records for Tadoba National Park. Of the total, 60 species were very common, 34 species were common, 9 were frequent common, 19 were rare, and 12 were very rare. Most of the butterflies recorded belong to the Nymphalidae (43 species) with 4 new records. Of Lycaenidae, 41 species with 12 new records. In Pieridae 19 species with 3 new records were recorded. A total of 20 Hesperidae species with 6 new records and 10 species were recorded from the Papilionidae with 2 new records and one species recorded from the family Riodinidae. About 12 species of the recorded ones come under the protection category of the Indian Wild Life protection Act 1972. The study provided an updated list of butterflies of Tadoba National Park.

**Key words:** Endangered species, IUCN, Lepidoptera, Papilionoidea, National park

**Received:**

27 September, 2022

**Accepted:**

12 December, 2022

**Published:**

01 January, 2023

**Subject Editor:**

Asghar Shirvani

**Citation:** Tiple, A.D. & Bhagwat, S.S. (2023) An updated list of butterfly (Lepidoptera, Rhopalocera) fauna of Tadoba National Park, Chandrapur, Maharashtra, Central India. *Journal of Insect Biodiversity and Systematics*, 9 (1), 103–114.

### INTRODUCTION

Butterflies are generally regarded as one of the best taxonomically studied groups of insects (Robbins & Opler, 1997), yet even in genera containing very common and widespread species, our understanding of true species diversity may prove to be startlingly below common expectation (Ackery, 1987; Willmott et al., 2001). Butterflies have been studied systematically since the early 18<sup>th</sup> century and about 18,000 species are documented worldwide (Martinez et al., 2003). Insects have been shown to be sensitive to changes in vegetation composition and the physical attributes of the environment (Gardner et al., 1995; Wood & Gillman, 1998) resulting in a decrease in insect diversity (Holloway, 1987; Holloway et al., 1992). Among insects, butterflies are the most beautiful and colourful creatures on the earth and have a great aesthetic value, which makes them very attractive. Butterflies are very important for pollination as they visit different flowers for nectar feeding, which makes them an important unit of the environment (Tiple et al., 2006). Besides, they form an important part of the food chain of birds, reptiles, amphibians, spiders and predatory insects; transforming and transmitting energy from green

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plants to the animal. Fabricius and Cramer initiated the studies on Indian butterflies as early as 1775 in India. The first was a 3-volume series, *The Butterflies of India, Burmah & Ceylon*, by Marshall and de Nicéville (Moore, 1881; Marshall & de Nicéville, 1883; de Nicéville, 1886, 1890). The second set was a 10-volume series started by Moore and finished by Swinhoe (Moore & Swinhoe (1890–1913), called *Lepidoptera Indica*, Bingham (1905), Bell (1909–1927), Ormiston (1924) and Yates (1935, 1946) who have contributed much more to explore the diversity of butterflies in ancient India. Talbot, (1939, 1947) has published his work on butterflies in the *Fauna of British India* in two volumes.

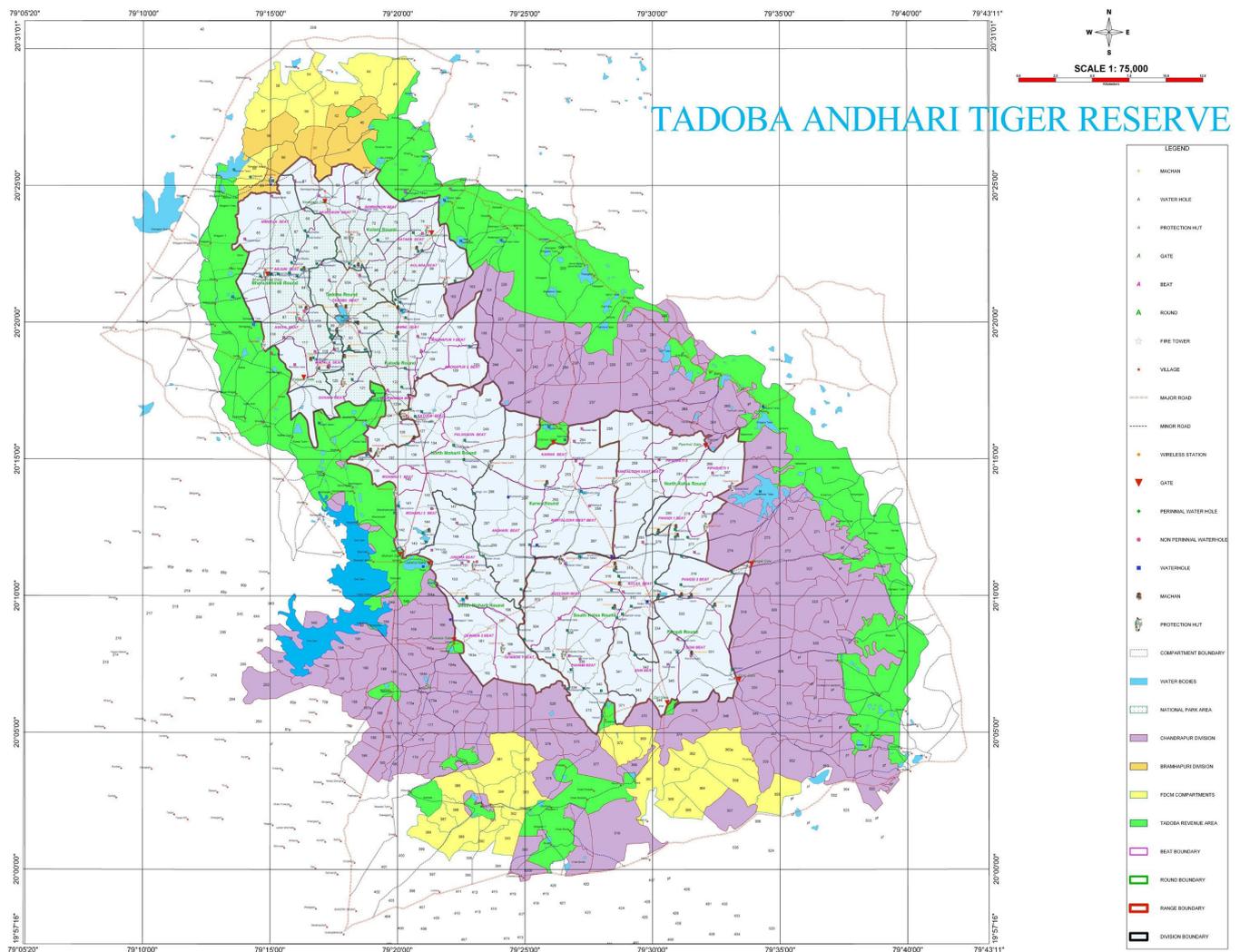
In Central India, the butterfly diversity was reported earlier by Forsayeth (1884), Swinhoe (1896), Betham (1890, 1891) and Witt (1909). Subsequent works include several species from Madhya Pradesh and Chhattisgarh (Evans, 1932; Talbot 1939, 1947; Wynter-Blyth, 1957). D'Abreu (1931) to document a total of 177 species occurring in the erstwhile Central Provinces including Pachmari, Pench and Seoni, Nimar, Hoshangabad, Jabalpur, Burahanpur, Raipur, Bastar, Chanda and Nagpur districts (Now Madhya Pradesh and Vidarbha). In addition to this, D'Abreu (1931) provided a special list of 92 species of butterflies from Nagpur city. In the recent past, several workers have studied butterflies from urban, rural and protected areas of Vidarbha.

The Indian subcontinent with a diverse terrain, climate, and vegetation hosts about 1,504 species of butterflies (Tiple, 2011) of which peninsular India hosts 351, and the Western Ghats 336 species. In Central India, the butterfly diversity was reported earlier by Forsayeth (1884), Swinhoe (1886); Betham (1890, 1891) and Witt (1909). D'Abreu (1931) documented a total of 177 species occurring in the erstwhile Central Provinces (now Madhya Pradesh and Vidarbha). So far, 43 species of butterflies belonging to 29 genera from the Tiger Reserve in Tadoba National Park, Maharashtra (Rai et al., 2006) and 68 species of butterflies belonging to 50 genera are recorded from Tadoba Andhari Tiger Reserve (Sharma & Radhakrishnan, 2006). Tiple (2010) recorded 111 species of butterflies from Tadoba National Park. The butterfly fauna of the Vidharbha Maharashtra is well-documented with 167 species (reviewed in Tiple, 2011) but few spatial gaps still remain. Some additions had been made for the fauna of the Vidarbha region recently by Deokar and Shukla (2015), Tiple (2018) and Tiple (2019). The present study is an attempt to update the list of butterflies from Tadoba National Park (reserve forest) in Chandrapur district.

## MATERIAL AND METHODS

The findings in the paper are based on opportunistic sampling and biweekly photographic documentation done in and around Tadoba National Park from 2011 to 2021. The Tadoba National Park is one of the well-known National Parks in India, famous for its flora, fauna and tigers (*Panthera tigris*) in Chandrapur district. Tadoba is also one of India's 28 Project Tiger Reserves. Tadoba National Park lies between longitude 79°15' to 79°28' and latitude 20°17' to 20°24' covering an approximate area of 623 sq.km (Fig. 1). The forests are well distributed over all the agro-climatic zones. The forest types found in the area are classified as sub-tropical hill forests, tropical moist deciduous forests, tropical dry deciduous forests and lush green deciduous forests (Champion & Seth, 1968), which are home to a variety of flora and fauna. Butterflies were surveyed in the reserve forest areas, buffer zone, lakes, rivers and surrounding areas. Butterflies were primarily identified in the field, following photography. Photographs of the specimens were taken in the field from various angles and identified with the help of a field identification guide (Wynter-Blyth, 1957; Kunte, 2000).

The species were categorized on the basis of their abundance in Tadoba National Park. The butterflies were categorized as **VC** – Very common (> 100 sightings), **C** – Common (51–100 sightings), **FC** – Frequent common (16–50 sightings), **R** – Rare (2–15 sightings), **VR** – Very rare (< 2 sightings) (Tiple, 2018). The species recorded for the first time from the Tadoba National Park are marked with pound sign/ hash (#) and those come under the Indian Wild Life Protection Act 1972 are marked with an asterisk \*.



**Figure 1.** Location map of Tadoba National Park in district Chandrapur, Maharashtra, Central India.

## RESULTS

### *Taxonomic hierarchy*

#### **Class Insecta Linnaeus, 1758**

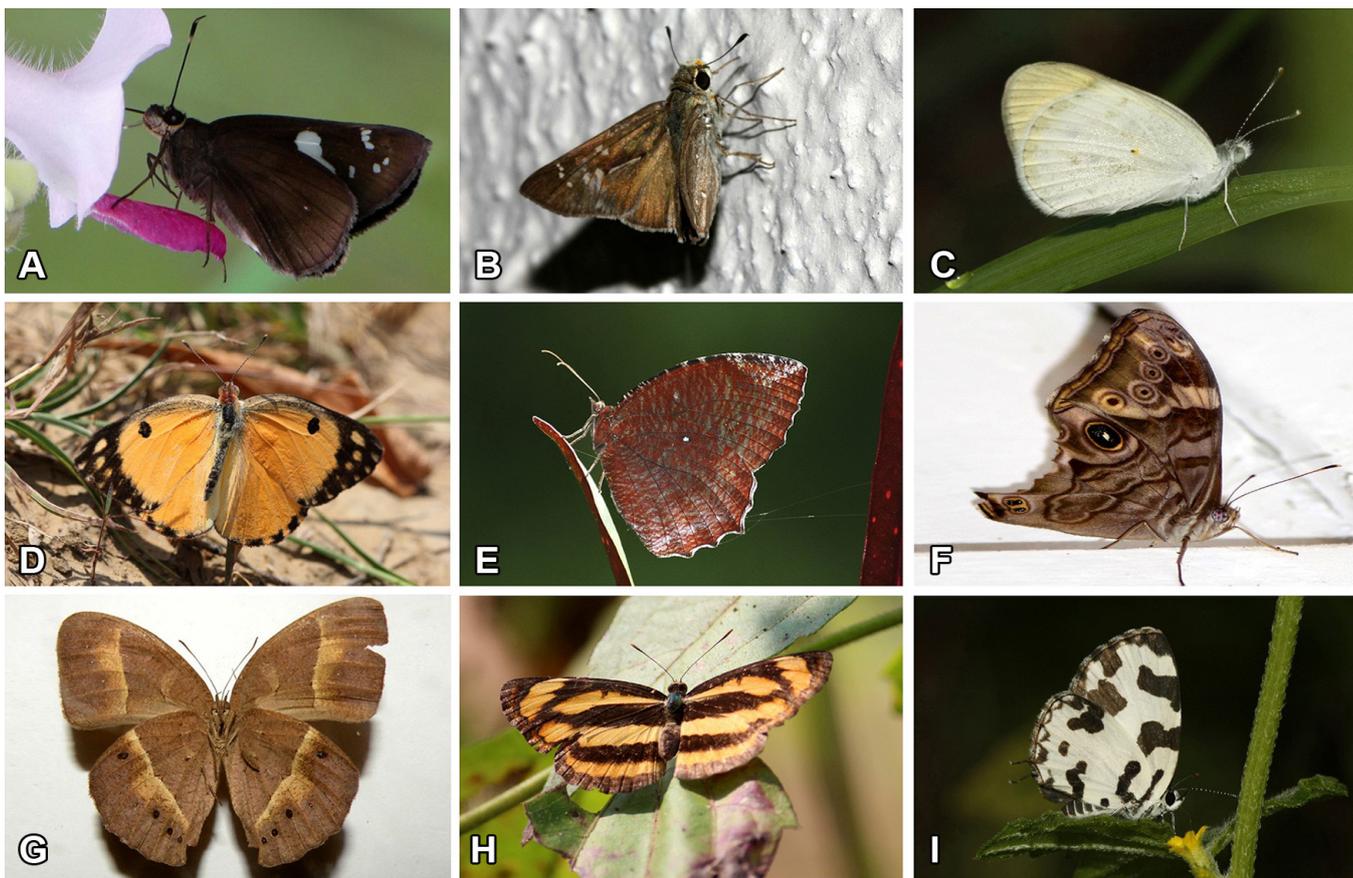
#### **Order Lepidoptera Linnaeus, 1758**

#### **Superfamily Papilionoidea Latreille, 1802**

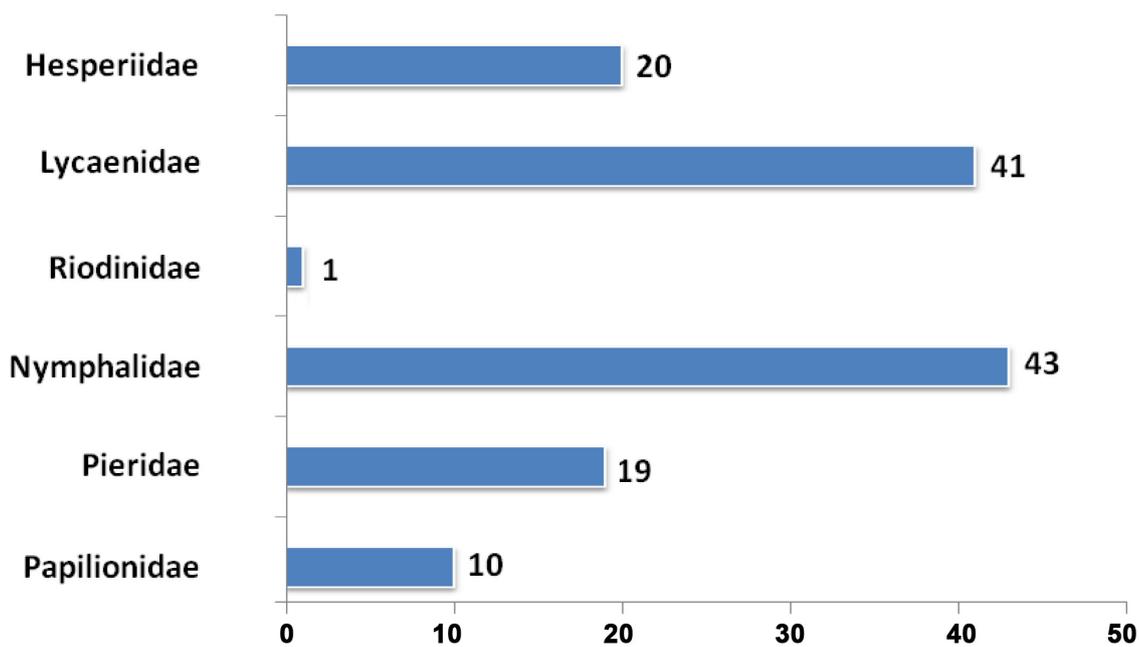
A total of 134 butterfly species, belonging to six families, were recorded, of those 27 species previously unrecorded on the Tadoba National Park (Figs 2–3). Butterflies were recorded from the family Nymphalidae (43 species) with 4 new records. Of Lycaenidae, 41 species were recorded with 12 new records. In Pieridae 19 species with 3 new records were recorded. A total of 20 Hesperidae species were recorded with 6 new records and 10 species were recorded from the Papilionidae with 2 new records and one species recorded from the family Riodinidae (Fig. 4). Among the 134 species of butterflies about 44% (60) were very common, 25% (34) species were common, 7% (09) were frequent common, 14% (19) were rare and 9% (12) were very rare. The observed and identified species, their status in Tadoba National Park are listed in [Table 1](#).



**Figure 2.** Newly recorded species of butterflies from Tadoba National Park, Chandrapur. A. *Chilades parrhasius* (Fabricius, 1793); B. *Curetis acuta* Moore, 1877; C. *Everes lacturnus* (Godart, 1824); D. *Petrelaea dana* (de Nicéville, 1884); E. *Prosotas noreia* (R. Felder, 1868); F. *Rapala manea* (Hewitson, 1863); G. *Rathinda amor* (Fabricius, 1775); H. *Spindasis elima* (Moore, 1877); I. *Spindasis schistacea* (Moore, 1881); J. *Spindasis schistacea*; K. *Tarucus balkanicus* (Freyer, 1844); L. *Papilio crino* Fabricius, 1793; M. *Caprona ransonnetii* (Felder, 1868); N. *Halpe porus* (Mabille, 1877); O. *Iambrix salsala* (Moore, 1866).



**Figure 3.** Newly recorded species of butterflies from Tadoba National Park, Chandrapur. **A.** *Notocrypta curvifascia* (C. & R. Felder, 1862); **B.** *Pelopidas agna* (Moore, 1866); **C.** *Colotis aurora* (Fabricius, 1775); **D.** *Colotis fausta* (Olivier, 1804); **E.** *Elymnias hypermnestra* (Linnaeus, 1763); **F.** *Lethe rohria* (Fabricius, 1787); **G.** *Mycalesis intermedia* (Moore, [1892]); **H.** *Pantoporia hordonia* (Stoll, 1790); **I.** *Caleta decidia* (Hewitson, 1876).



**Figure 4.** The number of butterfly species encountered in different families in the Tadoba National Park, Chandrapur.

**Table 1.** Butterfly species of Tadoba National Park and surroundings together with common name. \*Come under Indian Wild Life Protection Act 1972.

No	Common Name	Scientific Name	Status	IUCN	No	Common Name	Scientific Name	Status	IUCN
		<b>Papilionidae (10)</b>							
1.	Tailed Jay	<i>Graphium agamemnon</i> (Linnaeus, 1758)	VC	NE	36.	Black Rajah	<i>Charaxes solon</i> (Fabricius, 1793)	FC	NE
2.	Common Jay	<i>Graphium doson</i> (C. & R. Felder, 1864)	C	NE	37.	Plain Tiger	<i>Danaus chrysippus</i> (Linnaeus, 1758)	VC	NE
3.	Spot Swallowtail	<i>Graphium nomius</i> (Esper, 1799)	VC	NE	38.	Striped Tiger	<i>Danaus genutia</i> (Cramer, [1779])	VC	LC
4.	Common Rose	<i>Pachliopta aristolochiae</i> (Fabricius, 1775)	VC	LC	39.	Common Palmfly	<i>Elymnias hypermestra</i> (Linnaeus, 1763) #	VC	NE
5.	Crimson Rose	<i>Pachliopta hector</i> (Linnaeus, 1758)*	C	LC	40.	Common Indian Crow	<i>Euploea core</i> (Cramer, [1780])	C	NE
6.	Common Mime	<i>Papilio clytia</i> Linnaeus, 1758#	VR	NE	41.	Common Baron	<i>Euthalia aconthea</i> (Cramer, [1777])	VC	LC
7.	Common Banded Peacock	<i>Papilio crino</i> Fabricius, 1793#	R	NE	42.	Great Egfly	<i>Hypolimnas bolina</i> (Linnaeus, 1758)	VC	NE
8.	Lime Butterfly	<i>Papilio demoleus</i> Linnaeus, 1758	VC	NA	43.	Danaid Egfly	<i>Hypolimnas misippus</i> (Linnaeus, 1764)*	VC	NE
9.	Blue Mormon	<i>Papilio polymnestor</i> Cramer, [1775]	FC	NE	44.	Peacock Pansy	<i>Junonia almana</i> (Linnaeus, 1758)	VC	NA
10.	Common Mormon	<i>Papilio polytes</i> Linnaeus, 1758	VC	NE	45.	Grey Pansy	<i>Junonia atlites</i> (Linnaeus, 1763)	VC	LC
		<b>Pieridae (19)</b>			46.	Yellow Pansy	<i>Junonia hierta</i> (Fabricius, 1798)	VC	NE
11.	Common Albatross	<i>Appias albina</i> (Boisduval, 1836) *	VR	NE	47.	Chocolate Pansy	<i>Junonia iphita</i> (Cramer, [1779])	C	LC
12.	Striped Albatross	<i>Appias ilbythea</i> (Fabricius, 1775)	R	NE	48.	Lemon Pansy	<i>Junonia lemonias</i> (Linnaeus, 1758)	VC	NE
13.	Pioneer	<i>Belenois aurata</i> (Fabricius, 1793)	VC	NE	49.	Blue Pansy	<i>Junonia orithya</i> (Linnaeus, 1758)	VC	NE
14.	Common or Lemon Emigrant	<i>Catopsilia pomona</i> (Fabricius, 1775)	VC	NE	50.	Bamboo Treebrown	<i>Lethe europa</i> (Fabricius, 1775)	VC	NA
15.	Mottled Emigrant	<i>Catopsilia pyranthe</i> (Linnaeus, 1758)	VC	NE	51.	Common Treebrown	<i>Lethe rohria</i> (Fabricius, 1787) #	C	NE
16.	Common Gull	<i>Cepora neissera</i> (Fabricius, 1775)	VC	NE	52.	Common Evening Brown	<i>Melanitis leda</i> (Linnaeus, 1758)	VR	NE
17.	Plain Orange Tip	<i>Colotis aurora</i> (Fabricius, 1775) #	R	NE	53.	Commander	<i>Moduza procris</i> (Cramer, [1777])	VC	NE
18.	Crimson Tip	<i>Colotis danae</i> (Fabricius, 1775)	C	NE	54.	Intermediate Bushbrown	<i>Mycalides intermedia</i> (Moore, [1892]) #	C	NE
19.	Small Orange Tip	<i>Colotis erida</i> (Boisduval, 1836)	VC	NE	55.	Dark-brand Bushbrown	<i>Mycalides mineus</i> (Linnaeus, 1758)	R	NE
20.	Large Salmon Arab	<i>Colotis fausta</i> (Olivier, 1804) #	R	LC	56.	Common Bushbrown	<i>Mycalides persesus</i> (Fabricius, 1775)	C	NE
21.	Common Jezebel	<i>Delias eucharis</i> (Drury, 1773)*	VC	NE	57.	Long-brand Bushbrown	<i>Mycalides visala</i> Moore, [1858]	VC	NE
22.	Three-Spot Grass Yellow	<i>Eurema blanda</i> (Boisduval, 1836)	R	NE	58.	Common Sailer	<i>Neptis hylas</i> (Linnaeus, 1758)	C	NE
23.	Small Grass Yellow	<i>Eurema brigitta</i> (Stoll, [1780])	C	LC	59.	Chestnut-Streaked Sailer	<i>Neptis jumbah</i> Moore, [1858]	VC	NE
24.	Common Grass Yellow	<i>Eurema hecabe</i> (Linnaeus, 1758)	VC	NE	60.	Common Lascar	<i>Pantoporia hordonia</i> (Stoll, [1790]) #	C	NE
25.	Spotless Grass Yellow	<i>Eurema laeta</i> (Boisduval, 1836)	VC	NE	61.	Glassy Tiger	<i>Parantica aglea</i> (Stoll, [1782])	VR	NE
26.	White Orange Tip	<i>Ixias marlaine</i> (Cramer, [1779])	VC	NE	62.	Short-banded Sailer	<i>Phaedyma colunella</i> (Cramer, [1780])	VR	NE
27.	Yellow Orange Tip	<i>Ixias pyrene</i> (Linnaeus, 1764)	C	NE	63.	Common Leopard	<i>Phalanta phalantha</i> (Drury, [1773])	C	NE
28.	Psyche	<i>Leptostia nina</i> (Fabricius, 1793)#	C	NE	64.	Anomalous Nawab	<i>Polyura agraria</i> (Swinhoe, 1887)	VC	NE
29.	Common Wanderer	<i>Pareronia valeria</i> (Cramer, [1776])	VC	NE	65.	Common Nawab	<i>Polyura athamas</i> (Drury, [1773])	VC	NE
		<b>Nymphalidae (43)</b>			66.	Baronet	<i>Symphaedra nais</i> (Forster, 1771)	C	NE
30.	Tawny Coster	<i>Acraea violae</i> (Fabricius, 1793)	VC	NE	67.	Blue Tiger	<i>Tirumala limniace</i> (Cramer, [1775])	VC	NE
31.	Angled Castor	<i>Atiade ariadne</i> (Linnaeus, 1763)	VC	NE	68.	Painted Lady	<i>Vanessa cardui</i> (Linnaeus, 1758)	VC	NE
32.	Common Castor	<i>Atiade merione</i> (Cramer, [1777])	VC	NE	69.	Common Threeing	<i>Ypthina asteropae</i> (Klug, 1832)	R	LC
33.	Common Sergeant	<i>Athyma perisus</i> (Linnaeus, 1758)	R	NE	70.	Common Fivering	<i>Ypthina baldus</i> (Fabricius, 1775)	VC	LC
34.	Joker	<i>Byblia lithyia</i> (Drury, [1773])	VC	NE	71.	Common Fourring	<i>Ypthina huebneri</i> Kirby, 1871	FC	NE
35.	Tawny Rajah	<i>Charaxes pasiphon</i> Westwood, 1847	FC	NE	72.	Lesser Threeing	<i>Ypthina inica</i> Hewitson, 1865	VC	NE

Table 1. Continue.

No	Common Name	Scientific Name	Status	IUCN	No	Common Name	Scientific Name	Status	IUCN
73.	Two-spot Plum Judy	<i>Abisara bifasciata</i> Moore, 1877	C	NE	104.	Plumbeous Silverline	<i>Spindasis schistacea</i> (Moore, 1881) #	R	NE
74.	Common Hedge Blue	<b>Lycenidae (41)</b> <i>Acyrtodes puspa</i> (Horsfield, [1828])	VC	NE	105.	Common Silverline	<i>Spindasis vulcanus</i> (Fabricius, 1775)	VC	NE
75.	Pointed Ciliate Blue	<i>Anthene lycenina</i> (Felder, 1868) *	FC	NE	106.	Common Acacia Blue	<i>Surenbra quercetorum</i> (Moore, [1858])	VR	NE
76.	Large Oakblue	<i>Athopala ornata</i> (Hewitson, 1862)	FC	NE	107.	Red Pierrot	<i>Tallicada nyseus</i> (Guérin-Ménéville, 1843)	C	NE
77.	African Babul Blue	<i>Azanus jesus</i> (Guérin-Ménéville, 1849)	C	NE	108.	Black-spotted Pierrot	<i>Tarucus balkanicus</i> (Freyer, 1844) #	FC	NE
78.	Bright Babul Blue	<i>Azanus abaidus</i> (Stoll, [1782])	C	NE	109.	Spotted Pierrot	<i>Tarucus callinara</i> Butler, 1886 #*	C	NE
79.	Angled Pierrot	<i>Caleta decida</i> (Hewitson, 1876) #	VR	NE	110.	Striped Pierrot	<i>Tarucus nara</i> (Kollar, 1848)	VC	NE
80.	Common Pierrot	<i>Castalius rosimon</i> (Fabricius, 1775)	VC	NE	111.	Common Guana Blue	<i>Virachola isocrates</i> (Fabricius, 1793)	C	NE
81.	Forget-Me-Not	<i>Catochrysops strabo</i> (Fabricius, 1793)	VC	NE	112.	Dark Grass Blue	<i>Zizeeria karsandra</i> (Moore, 1865)	VC	NE
82.	Lime Blue	<i>Chilades lajus</i> (Stoll, [1780])	VC	NE	113.	Lesser Grass Blue	<i>Zizina otis</i> (Fabricius, 1787)	VC	NE
83.	Small Cupid	<i>Chilades parthosius</i> (Fabricius, 1793) #	R	NE	114.	Triny Grass Blue	<i>Zizula hylax</i> (Fabricius, 1775)	VC	NE
84.	Angled Sunbeam	<i>Curetis acuta</i> Moore, 1877 #	VR	NE					
85.	Gram Blue	<i>Euchrysops enelus</i> (Fabricius, 1798) *	VC	NE	115.	Brown Awl	<b>Hesperidae (20)</b> <i>Badamia exclamatoris</i> (Fabricius, 1775)	VC	NE
86.	Indian Cupid	<i>Everes lacturnus</i> (Godart, [1824]) #	R	NE	116.	Painbrush Swift	<i>Baoris farril</i> (Moore, 1878) *	C	NE
87.	Eastern Grass Jewel	<i>Freyeria putli</i> (Kollar, [1844])	VC	NE	117.	Rice Swift	<i>Borbo cinnara</i> (Wallace, 1866)	VC	NE
88.	Pointed Lineblue	<i>Ianolyce helicon</i> (C. Felder, 1860) #*	R	NE	118.	Blank Swift	<i>Caloris kunara</i> (Moore, 1878)	FC	NE
89.	Dark Cerulean	<i>Janides bochus</i> (Stoll, [1782])	C	NE	119.	Golden Angle	<i>Caprona ransonnethi</i> (Felder, 1868) #	R	NE
90.	Common Cerulean	<i>Janides celeno</i> (Cramer, [1775])	VC	NE	120.	Tricolour Pied Flat	<i>Coladenia indrani</i> (Moore, [1866])	R	NE
91.	Pea Blue	<i>Lampides boeticus</i> (Linnaeus, 1767) *	VC	NE	121.	Moore's Ace	<i>Halpe porus</i> (Mabille, [1877]) #	R	NE
92.	Zebra Blue	<i>Leptotes plinius</i> (Fabricius, 1793)	VC	NE	122.	Common Banded Awl	<i>Hasora chromus</i> (Cramer, [1780])	VC	NE
93.	Plains Cupid	<i>Luthrodes pandava</i> (Horsfield, [1829])	VC	NE	123.	Chestnut Bob	<i>Iambix salsola</i> (Moore, [1866]) #	FC	NE
94.	White-tipped Lineblue	<i>Prosotas noreia</i> (R. Felder, 1868) #*	VR	NE	124.	Common Redeye	<i>Matapa aria</i> (Moore, [1866])	C	NE
95.	Dingy Lineblue	<i>Petrelaea dana</i> (de Nicéville, [1884])	R	NE	125.	Obscure Banded Swift	<i>Notocrypta curujascia</i> (C. & R. Felder, 1862) #	VR	NE
96.	Tailless Lineblue	<i>Prosotas dubiosa</i> (Semper, [1879])	C	NE	126.	Small Branded Swift/Variable swift	<i>Pelopidas agna</i> (Moore, [1866]) #	C	NE
97.	Common Lineblue	<i>Prosotas nora</i> (C. Felder, 1860)	C	NE	127.	Large Branded Swift/ Moore's Swift	<i>Pelopidas mathias</i> (Fabricius, 1798)	VC	NE
98.	Pale Grass Blue	<i>Pseudazzeeria maha</i> (Kollar, [1844])	C	NE	128.	Fulvous Pied Flat	<i>Pseudocoladenia dan</i> (Fabricius, 1787) #	C	NE
99.	Slate Flash	<i>Rapala manea</i> (Hewitson, 1863) #	VR	NE	129.	Indian Skipper	<i>Spialia galba</i> (Fabricius, 1793)	VC	NE
100.	Common Red Flash	<i>Rapala larbus</i> (Fabricius, 1787)	C	NE	130.	Indian Palm Bob	<i>Suastrus gremius</i> (Fabricius, 1798)	C	NE
101.	Monkey Puzzle	<i>Rothinda ornor</i> (Fabricius, 1775) #	VR	NE	131.	Dark Palm Dart	<i>Telicota bambusae</i> (Moore, 1878)	VC	NE
102.	Scarce Shot Silverline	<i>Spindasis ellma</i> (Moore, 1877) #*	R	NE	132.	Pale Palm Dart	<i>Telicota colon</i> (Fabricius, 1775)	C	NE
103.	Common Shot Silverline	<i>Spindasis iclis</i> (Hewitson, 1865)	C	NE	133.	Grass Demon	<i>Udaspes folus</i> (Cramer, [1775])	C	NE

Among the 134 butterflies recorded from Tadoba National Park, 12 species come under the protected category of the Indian Wild Life (Protection) Act, 1972. Among them *Pachliopta hector* (Linnaeus, 1758), *Hypolimnas misippus* (Linnaeus, 1764) and *Prosotas noreia* (R. Felder, 1868) come under Schedule I of the Act. The species recorded which come under Schedule II were *Anthene lycaenina* (C. Felder, 1860), *Euchrysops cnejus* (Fabricius, 1798), *Lampides boeticus* (Linnaeus, 1767), *Ionolyce helicon* (C. Felder, 1860), *Spindasis elima* (Moore, 1877), *Tarucus callinara* Butler, 1886. The species recorded which came under schedule IV were *Appias albina* (Boisduval, 1836), *Delias eucharis* (Drury, 1773), *Baoris farri* (Moore, 1878) (Gupta & Mondal, 2005; Kunte 2000).

**Seasonal occurrence.** Most butterfly species were observed from the monsoon (hot/wet season) to early winter (cool/wet season) but thereafter declined in early summer (March). Among the 134 species of butterflies, *Papilio demoleus*, *Pachliopta hector*, *Pachliopta aristolochiae*, *Catopsilia pyranthe*, *Catopsilia Pomona*, *Eurema hecabe*, *Cepora nerissa*, *Danaus chrysippus*, *Hypolimnas bolina*, *Hypolimnas misippus*, *Tirumala limniace*, *Acraea violae*, *Euploea core*, *Junonia lemonias*, *Junonia almanac*, *Junonia iphita*, *Melanitis leda*, *Phalanta phalantha*, *Symphhaedra nais*, *Catochrysops strabo*, *Freyeria putli*, *Euchrysops cnejus*, *Leptotes plinius*, *Prosotas nora*, *Zizeeria karsandra*, *Badamia exclamationis*, *Borbo cinnara*, *Pelopidas mathias*, *Telicota bambusae* were occurred throughout the year (January–December), whereas remaining 104 species of butterflies were prominently observed only after June–July till the beginning of summer (April–May).

## DISCUSSION

Nymphalidae is dominantly found in all habitat types because this family has the largest number of species (43 species) that are mostly polyphagous, and is widely distributed compared to other families (Bora & Meitei, 2014; Tiple et al., 2022). These butterflies have varied colors such as brown, orange, yellow, and black and also sizes ranging from small to large. Furthermore, there is an increased number of Nymphalidae because the study site contains plants that support lives as a source of food and shelter (Tiple et al., 2011). Increasing species abundance from beginning of monsoon (June–July) till the early winter (August–November) and decline in species abundance from late winter (January – February) up to the end of summer have also been reported by Deokar and Shukla (2015), Tiple et al. (2007), Tiple and Khurad (2009a) and Tiple (2018) in similar climatic conditions in this region of Central India. They further demonstrated that most of the species were noticeably absent in the disturbed and human impacted sites (plantation and grassland) and there was no occurrence of unique species in moderately disturbed areas comparable to those of less disturbed wild areas. The present study-site being a Tadoba National Park is always disturbed and human impacted, which may be the reasons for overall reduction of species of uniqueness from disturbed and impacted sites as compared to the other sites.

In the present study seasonal occurrence of butterfly species was high from monsoon (hot/wet season) to early winter (cool/wet season) but thereafter declined in early summer (March). The cause of this decline might be non-availability of nectar and larval host plants, scarcity of water and cutting of grasslands (Tiple & Khurad, 2009b). Butterfly populations would clearly benefit from planting indigenous, as opposed to exotic, nectar and larval host plants which are the sources of various proteins and salts that are essentially required for build-up of healthy and genetically diverse butterfly populations (Tiple et al., 2006). In particular, attention should be paid to the seasonal availability of resources and to resources for less common butterflies on this reserve forest area. All in all, this reserve forest area (Tadoba National Park) provides rich ground not just for conservation but also for research into butterfly biology for the students.

## AUTHOR'S CONTRIBUTION

The authors confirm their contribution in the paper as follows: A.D.T. and S.S.B.: Designed the study, carried out the fieldwork, and prepared the manuscript, A.D.T. revised the final draft. Both authors read and approved the final version of the manuscript.

## FUNDING

This research received no specific grant from any funding agencies.

## AVAILABILITY OF DATA AND MATERIAL

Not applicable.

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

## CONSENT FOR PUBLICATION

Not applicable.

## CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this paper.

## ACKNOWLEDGMENTS

We are thankful to State Forest Department, Nagpur, Maharashtra for encouragement.

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## فهرست روزآمد فون پروانه‌های روزپرواز (Lepidoptera, Rhopalocera) پارک ملی تادوبا، چاندراپور، ماهاراشترا، هند

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| تاریخ دریافت: ۰۵ مهر ۱۴۰۱ | تاریخ پذیرش: ۲۱ آذر ۱۴۰۱ | تاریخ انتشار: ۱۱ دی ۱۴۰۱ |

**چکیده:** این تحقیق با هدف تهیه فهرست روزپرها پارک ملی تادوبا، واقع در ناحه چاندراپور به مساحت ۶۳ کیلومتر مربع و طی سال‌های ۲۰۱۱ تا ۲۰۲۱ انجام شد. به طور کلی حضور ۱۳۴ گونه روزپرخ در این ناحیه شناسایی شد که ۲۷ مورد از آنها برای اولین بار گزارش می‌شوند. از بین کل گونه‌ها، ۶۰ مورد بسیار عمومی، ۳۴ مورد عمومی، ۹ مورد شایع، ۱۹ مورد کمیاب و ۱۲ مورد نیز بسیار کمیاب بودند. اکثر روزپرخ‌های گزارش شده، به خانواده Nymphalidae (۴۳ گونه) تعلق دارند که ۴ گونه به تازگی گزارش شدند. به همین شکل ۴۱ گونه از خانواده Lycaenidae با ۱۲ گزارش جدید، ۱۹ گونه از خانواده Pieridae با ۳ گزارش جدید، ۲۰ گونه از خانواده Hesperidae با ۵ گزارش جدید و ۱۰ گونه از خانواده Papilionidae با ۲ گزارش جدید ثبت شدند. حدود ۱۲ گونه تحت قانون حفاظت حیات وحش هند (مصوبه ۱۹۷۲) قرار می‌گیرند. با انجام این تحقیق، فهرست روزپرخ‌های پارک ملی تادوبا به‌روزرسانی شد.

**واژگان کلیدی:** گونه‌های در خطر انقراض، بال‌پولکیان، دم‌چلچله‌ای‌ها، پارک ملی