

# **BUTTERFLY (LEPIDOPTERA: RHOPALOCERA) FAUNA OF PENCH TIGER RESERVE, NAGPUR, MAHARASHTRA, CENTRAL INDIA**

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## **ABSTRACT**

The diversity of butterfly species was studied in the Pench Tiger Reserve, Nagpur district, in an area of 741 sq. km. from 2008 to 2022. A total of 124 species were recorded, with an addition of 60 new species for Pench Tiger Reserve, Nagpur. Most of the butterflies recorded belong to the family Nymphalidae (43 species) with 17 new records, followed by Lycaenidae with 34 species including 20 new records, Pieridae 18 species with 06 new records, Hesperidae 18 species with 12 new records; 10 species were recorded from the Papilionidae with 05 new records and one species recorded from the family Riodinidae. The observations support the value of the Tiger Reserve area in providing valuable habitats for butterflies.

## **INTRODUCTION**

In Central India, the butterfly diversity was reported earlier by Forsayeth (1884); Swinhoe (1886); Betham (1890, 1891) & Witt (1909). Subsequent works include

reports of several species from Madhya Pradesh and Chhattisgarh (Evans, 1932; Talbot, 1939, 1947; Wynter-Blyth, 1957). D'Abreu (1931) documented a total of 177 species occurring in the erstwhile Central Provinces (now Madhya Pradesh and Vidarbha). In the recent past, several workers have studied butterflies from urban, rural and protected areas of Vidarbha. Singh (2004) reported 45 species of butterfly; later on, 65 species were reported by Sharma & Radhakrishnan (2004) from Pench Tiger Reserve, Maharashtra. The butterfly fauna of Vidharbha, Maharashtra is well-documented with 167 species (reviewed in Tiple, 2011), but a few spatial gaps still remain. Some additions had been made to the fauna of Vidarbha region recently by Deokar & Shukla, 2015; Tiple, 2018; Tiple, 2019; Tiple, 2020; Tiple & Bhagwat, 2023. The present study is an attempt to document the diversity of butterflies from Pench National Park (reserve forest) in Nagpur district.

## MATERIALS AND METHODS

Butterflies were photographed and identified in different regions of the Pench National Park, Nagpur between 2008 to 2022. Butterflies were surveyed in the Reserve Forest areas, buffer zone, lake shores, river banks and surrounding area during the monsoon and post monsoon period. 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 field identification guide (Wynter-Blyth, 1957; Kunte, 2000).

The species were categorized on the basis of their abundance in Pench 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 *et.al* 2006; Tiple, 2018).

### Study area

The Pench National Park and Tiger Reserve extends over an area of 741 sq.km in the lower southern reaches of the Satpura hill ranges, along the northern boundary of Nagpur District and located at 21°47'N 79°19'E. The temperature ranges from 12–45°C with a relative humidity between 10% to 95%. The Pench River, divides the park in half and gives it its name. Pench is a significant ecosystem that supports an abundance of flora and fauna, including a rich variety of aquatic life. Pench is rich in biodiversity and has a terrain that is characterised by hills,

valleys, and the occasional precipitous slope (Fig. 1 & 2).

The vegetation of the area falls into two major categories: Tropical Dry Deciduous and Tropical Moist Deciduous type (Champion & Seth, 1968). These forest types, for the present study, were further sub-divided as Teak dominant forest (*Tectona grandis* with associated species like *Madhuca indica*, *Diospyros melanoxylon*, *Terminalia tomentosa*, *Buchanania lanzan*, *Lagerstroemia parviflora*, *Miliusa velutina* and *Lansea coromandelica*), Miscellaneous forest (Teak mixed *Anogeissus latifolia*-*Bosewellia serrata* mixed stands, hill forest and *Zizyphus-Butea* mixed woodland), bamboo-dominant (*Dendrocalamus strictus*) forest, *Cleistanthus collinus* woodland, grassland–savanna, open scrub jungle (Dominated by *Lantana camara*) and wetlands (river, streams, ponds and reservoir).

## RESULTS AND DISCUSSION

During the course of study 124 species of butterflies belonging to six families were recorded. This study added 60 species as new records for Pench Tiger Reserve, Nagpur (Fig. 4 to 8). Out of the recorded families, Nymphalidae (43 species) with 17 new records was the richest family, followed by Lycaenidae with 34 species with 20 new records, Pieridae with 18 species with 06 new records, Hesperidae with 18 species with 12 new records, Papilionidae with 10 species with 05 new records and one species recorded from Riodinidae (see Fig. 3 & Table 1).

Among the 124 species of butterflies about 48% (60) were very common, 26% (32) species were common, 6% (08) were frequent common, 15% (18) were rare and 5% (06) were very rare. The observed and identified species, their status in Pench Tiger Reserve are listed in Table 1.

Among the 124 species of butterflies, 29 species were found throughout the year (January–December), whereas the remaining 95 species of butterflies were prominently observed only after June–July till the beginning of summer (April–May). 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 Tiple *et al.*, (2007) and Tiple & Khurad (2009) in similar climatic conditions in this region of central India.

Tiple *et al.*, (2007) and Tiple & Khurad (2009) similarly demonstrated that the majority of species were conspicuously absent from sites that had been disturbed and impacted by human activity. Additionally, they found that rare species were completely absent from environments that were comparable to less-disturbed wild areas. Human activity consistently disturbs and stresses the Pench Tiger Reserve's buffer area, which may be the cause of the unique species' overall decline from human-disturbed sites relative to the other sites. The absence of nectar and larval host plants, water scarcity, and grazing land clearing may be the causes of this decline (Tiple *et al.*, 2007).

The results of this study highlight the significance of the Pench Tiger Reserve as a preferred butterfly habitat. If the plantation is thoughtfully planned, the variety of butterflies in Pench Tiger Reserve may increase, creating a rich environment for butterfly conservation and research. This research will also advance our understanding of the complex mutualistic interactions between butterflies and flowering plants, which are crucial to the sustainability of ecosystem services. The current checklist of butterfly species is not exhaustive or conclusive, and further research will be done to update it. This inventory on butterfly fauna contributes as a baseline for future study on various aspects; especially in the central India region and will help in the conservation of these Teak forests.

#### ACKNOWLEDGEMENT

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**Table 1:** Butterfly species of Pench National Park, Nagpur and surroundings together with common names. The species recorded for the first time from the PTR are marked with pound sign/ hash (#).

Sr. No.	Common Name	Scientific Name	Status	IUCN
		<b>Papilionidae (10)</b>		
1.	Tailed Jay	<i>Graphium agamemnon</i> (Linnaeus, 1758) #	VC	NE
2.	Common Jay	<i>Graphium doson</i> (C. & R. Felder, 1864) #	C	NE
3.	Spot Swordtail	<i>Graphium nomius</i> (Esper, 1799)	VC	NE
4.	Common Rose	<i>Pachliopta aristolochiae</i> (Fabricius, 1775)	VC	LC
5.	Crimson Rose	<i>Pachliopta hector</i> (Linnaeus, 1758) #	C	LC
6.	Common Mime	<i>Papilio clytia</i> Linnaeus, 1758	VR	NE
7.	Common Banded Peacock	<i>Papilio crino</i> Fabricius, 1793#	R	NE
8.	Lime Butterfly	<i>Papilio demoleus</i> Linnaeus, 1758	VC	NA
9.	Blue Mormon	<i>Papilio polymnestor</i> Cramer, [1775] #	FC	NE
10.	Common Mormon	<i>Papilio polytes</i> Linnaeus, 1758	VC	NE
		<b>Pieridae (18)</b>		

11.	Common Albatross	<i>Appias albina</i> (Boisduval, 1836)	VR	NE
12.	Striped Albatross	<i>Appias libythea</i> (Fabricius, 1775) #	R	NE
13.	Pioneer	<i>Belenois aurota</i> (Fabricius, 1793)	VC	NE
14.	Common or Lemon Emigrant	<i>Catopsilia pomona</i> (Fabricius, 1775)	VC	NE
15.	Mottled Emigrant	<i>Catopsilia pyranthe</i> (Linnaeus, 1758)	VC	NE
16.	Common Gull	<i>Cepora nerissa</i> (Fabricius, 1775)	VC	NE
17.	Crimson Tip	<i>Colotis danae</i> (Fabricius, 1775) #	C	NE
18.	Small Orange Tip	<i>Colotis etrida</i> (Boisduval, 1836)	VC	NE
19.	Large Salmon Arab	<i>Colotis fausta</i> (Olivier, 1804) #	R	LC
20.	Common Jezabel	<i>Delias eucharis</i> (Drury, 1773)	VC	NE
21.	Small Grass Yellow	<i>Eurema brigitta</i> (Stoll, [1780])	C	LC
22.	Common Grass Yellow	<i>Eurema hecabe</i> (Linnaeus, 1758)	VC	NE
23.	Spotless Grass Yellow	<i>Eurema laeta</i> (Boisduval, 1836)	VC	NE
24.	Three-Spot Grass Yellow	<i>Eurema blanda</i> (Boisduval, 1836)	R	NE
25.	White Orange Tip	<i>Ixias marianne</i> (Cramer, [1779])	VC	NE
26.	Yellow Orange Tip	<i>Ixias pyrene</i> (Linnaeus, 1764) #	C	NE
27.	Psyche	<i>Leptosia nina</i> (Fabricius, 1793) #	C	NE
28.	Common Wanderer	<i>Pareronia anais</i> (Lesson, 1837) #1	VC	NE
		<b>Nymphalidae (43)</b>		
29.	Tawny Coster	<i>Acraea violae</i> (Fabricius, 1793)	VC	NE
30.	Angled Castor	<i>Ariadne ariadne</i> (Linnaeus, 1763)	VC	NE
31.	Common Castor	<i>Ariadne merione</i> (Cramer, [1777]) #	VC	NE
32.	Common Sergeant	<i>Athyma perius</i> (Linnaeus, 1758) #	R	NE
33.	Joker	<i>Byblia ilithyia</i> (Drury, [1773]) #	VC	NE
34.	Plain Rajah	<i>Charaxes psaphon</i> Westwood, 1847#	FC	NE
35.	Black Rajah	<i>Charaxes solon</i> (Fabricius, 1793)	FC	NE
36.	Plain Tiger	<i>Danaus chrysippus</i> (Linnaeus, 1758)	VC	LC
37.	Common Tiger	<i>Danaus genutia</i> (Cramer, [1779])	VC	NE
38.	Common Palmfly	<i>Elymnias hypermnestra</i> (Linnaeus, 1763) #	C	NE
39.	Common Indian Crow	<i>Euploea core</i> (Cramer, [1780])	VC	LC

40.	Common Baron	<i>Euthalia aconthea</i> (Cramer, [1777]) #	VC	NE
41.	Gaudy Baron	<i>Euthalia lubentina</i> (Cramer, [1777])	VR	NE
42.	Great Eggfly	<i>Hypolimnas bolina</i> (Linnaeus, 1758)	VC	NE
43.	Danaid Eggfly	<i>Hypolimnas misippus</i> (Linnaeus, 1764)	VC	NA
44.	Peacock Pansy	<i>Junonia almana</i> (Linnaeus, 1758)	VC	LC
45.	Grey Pansy	<i>Junonia atlites</i> (Linnaeus, 1763)	VC	NE
46.	Yellow Pansy	<i>Junonia hierta</i> (Fabricius, 1798)	C	LC
47.	Chocolate Pansy	<i>Junonia iphita</i> (Cramer, [1779])	VC	NE
48.	Lemon Pansy	<i>Junonia lemonias</i> (Linnaeus, 1758)	VC	NE
49.	Blue Pansy	<i>Junonia orithya</i> (Linnaeus, 1758)	VC	NA
50.	Bamboo Treebrown	<i>Lethe europa</i> (Fabricius, 1775) #	C	NE
51.	Common Treebrown	<i>Lethe rohria</i> (Fabricius, 1787)	R	NE
52.	Common Evening Brown	<i>Melanitis leda</i> (Linnaeus, 1758)	VC	NE
53.	Commander	<i>Moduza procris</i> (Cramer, [1777])	C	NE
54.	Intermediate Bushbrown	<i>Mycalesis intermedia</i> (Moore, [1892]) #	R	NE
55.	Dark-brand Bushbrown	<i>Mycalesis mineus</i> (Linnaeus, 1758)	C	NE
56.	Common Bushbrown	<i>Mycalesis perseus</i> (Fabricius, 1775) #	VC	NE
57.	Long-brand Bushbrown	<i>Mycalesis visala</i> Moore, [1858] #	C	NE
58.	Common Sailer	<i>Neptis hylas</i> (Linnaeus, 1758)	VC	NE
59.	Chestnut-Streaked Sailer	<i>Neptis jumbah</i> Moore, [1858] #	C	NE
60.	Glassy Tiger	<i>Parantica aglea</i> (Stoll, [1782]) #	VR	NE
61.	Short-banded Sailer	<i>Phaedyma columella</i> (Cramer, [1780]) #	C	NE
62.	Common Leopard	<i>Phalanta phalantha</i> (Drury, [1773])	VC	NE
63.	Anomalous Nawab	<i>Polyura agraria</i> (Swinhoe, 1887) #	VC	NE
64.	Common Nawab	<i>Polyura athamas</i> (Drury, [1773]) #	C	NE
65.	Baronet	<i>Symphaedra nais</i> (Forster, 1771)	VC	NE
66.	Blue Tiger	<i>Tirumala limniace</i> (Cramer, [1775])	VC	NE
67.	Painted Lady	<i>Vanessa cardui</i> (Linnaeus, 1758)	R	LC
68.	Common Threering	<i>Ypthima asterope</i> (Klug, 1832)	VC	LC
69.	Common Fourring	<i>Ypthima huebneri</i> Kirby, 1871	R	NE

70.	Common Fivering	<i>Ypthima baldus</i> (Fabricius, 1775) #	FC	NE
71.	Lesser Threering	<i>Ypthima inica</i> Hewitson, 1865#	VC	NE
		<b>Riodinidae (1)</b>		
72.	Two-spot Plum Judy	<i>Abisara bifasciata</i> Moore, 1877#	C	NE
		<b>Lycaenidae (34)</b>		
73.	Common Hedge Blue	<i>Acytolepis puspa</i> (Horsfield, [1828]) #	VC	NE
74.	Plain Hedge Blue	<i>Celastrina lavendularis</i> (Moore, 1877)	VR	
75.	Pointed Ciliate Blue	<i>Anthene lycaenina</i> (Felder, 1868) #	FC	NE
76.	Large Oakblue	<i>Arhopala amantes</i> (Hewitson, 1862) #	FC	NE
77.	African Babul Blue	<i>Azonus jesous</i> (Guérin-Méneville, 1849) #	C	NE
78.	Bright Babul Blue	<i>Azonus ubaldus</i> (Stoll, [1782]) #	C	NE
79.	Common Pierrot	<i>Castalius rosimon</i> (Fabricius, 1775)	VC	NE
80.	Forget-Me-Not	<i>Catochrysops strabo</i> (Fabricius, 1793)	VC	NE
81.	Lime Blue	<i>Chilades lajus</i> (Stoll, [1780]) #	VC	NE
82.	Small Cupid	<i>Chilades parrhasius</i> (Fabricius, 1793) #	R	NE
83.	Gram Blue	<i>Euchrysops cnejus</i> (Fabricius, 1798)	VC	NE
84.	Indian Cupid	<i>Everes lacturnus</i> (Godart, [1824]) #	R	NE
85.	Eastern Grass Jewel	<i>Freyeria putli</i> (Kollar, [1844])	VC	NE
86.	Dark Cerulean	<i>Jamides bochus</i> (Stoll, [1782])	C	NE
87.	Common Cerulean	<i>Jamides celeno</i> (Cramer, [1775])	VC	NE
88.	Pea Blue	<i>Lampides boeticus</i> (Linnaeus, 1767)	VC	NE
89.	Zebra Blue	<i>Leptotes plinius</i> (Fabricius, 1793)	VC	NE
90.	Plains Cupid	<i>Luthrodes pandava</i> (Horsfield, [1829]) #	VC	NE
91.	Tailless Lineblue	<i>Prosotas dubiosa</i> (Semper, [1879]) #	C	NE
92.	Common Lineblue	<i>Prosotas nora</i> (C. Felder, 1860) #	C	NE
93.	Pale Grass Blue	<i>Pseudozizeeria maha</i> (Kollar, [1844])	C	NE
94.	Common Red Flash	<i>Rapala iarbus</i> (Fabricius, 1787) #	C	NE
95.	Slate Flash	<i>Rapala manea</i> (Hewitson, 1863) #	R	NE

96.	Scarce Shot Silverline	<i>Spindasis elima</i> (Moore, 1877) #	R	NE
97.	Common Shot Silverline	<i>Spindasis ictis</i> (Hewitson, 1865) #	C	NE
98.	Plumbeous Silverline	<i>Spindasis schistacea</i> (Moore, 1881) #	R	NE
99.	Common Silverline	<i>Spindasis vulcanus</i> (Fabricius, 1775)	VC	NE
100.	Red Pierrot	<i>Talicada nyseus</i> (Guérin- Menéville, 1843) #	C	NE
101.	Spotted Pierrot	<i>Tarucus callinara</i> Butler, 1886 #	C	NE
102.	Striped Pierrot	<i>Tarucus nara</i> (Kollar, 1848)	VC	NE
103.	Common Guava Blue	<i>Virachola isocrates</i> (Fabricius, 1793) #	C	NE
104.	Dark Grass Blue	<i>Zizeeria karsandra</i> (Moore, 1865) #	VC	NE
105.	Lesser Grass Blue	<i>Zizina otis</i> (Fabricius, 1787)	VC	NE
106.	Tiny Grass Blue	<i>Zizula hylax</i> (Fabricius, 1775)	VC	NE
		<b>Hesperiidae (18)</b>		
107.	Brown Awl	<i>Badamia exclamationis</i> (Fabricius, 1775)	VC	NE
108.	Paintbrush Swift	<i>Baoris farri</i> (Moore, 1878) #	C	NE
109.	Rice Swift	<i>Borbo cinnara</i> (Wallace, 1866) #	VC	NE
110.	Blank Swift	<i>Caltoris kumara</i> (Moore, 1878) #	FC	NE
111.	Golden Angle	<i>Caprona ransonnetii</i> (Felder, 1868) #	R	NE
112.	Spotted Angle	<i>Caprona agama</i> (Moore, [1858]) #	VR	NE
113.	Tricolour Pied Flat	<i>Coladenia indrani</i> (Moore, [1866])	R	NE
114.	Moore's Ace	<i>Halpe porus</i> (Mabille, [1877]) #	R	NE
115.	Common Banded Awl	<i>Hasora chromus</i> (Cramer, [1780])	VC	NE
116.	Chestnut Bob	<i>Iambrix salsala</i> (Moore, [1866]) #	FC	NE
117.	Common Redeye	<i>Matapa aria</i> (Moore, [1866]) #	C	NE
118.	Small Branded Swift/Variable swift	<i>Pelopidas mathias</i> (Fabricius, 1798) #	VC	NE
119.	Large Branded Swift/Moore's Swift	<i>Pelopidas subochracea</i> (Moore, 1878)	R	NE
120.	Indian Skipper	<i>Spialia galba</i> (Fabricius, 1793)	VC	NE
121.	Indian Palm Bob	<i>Suastus gremius</i> (Fabricius, 1798) #	C	NE
122.	Dark Palm Dart	<i>Telicota bambusae</i> (Moore, 1878)	VC	NE
123.	Pale Palm Dart	<i>Telicota colon</i> (Fabricius, 1775) #	C	NE

124.	Grass Demon	<i>Udaspes folus</i> (Cramer, [1775]) #	C	NE
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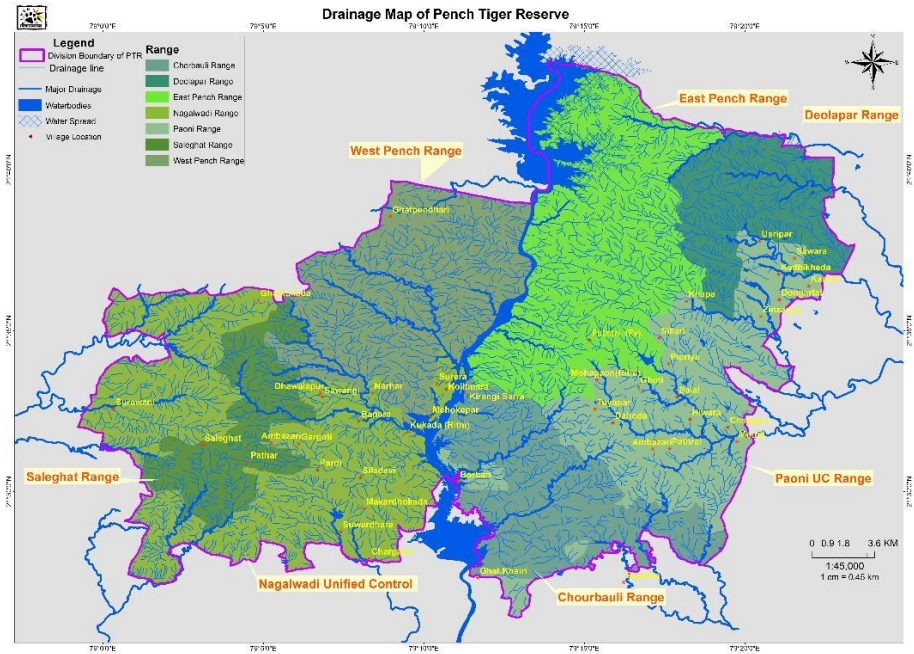


Figure 1. Location map of Pench Tiger Reserve in district Nagpur, Maharashtra, Central India



Figure 2. Natural habitats of Pench Tiger Reserve, Nagpur.

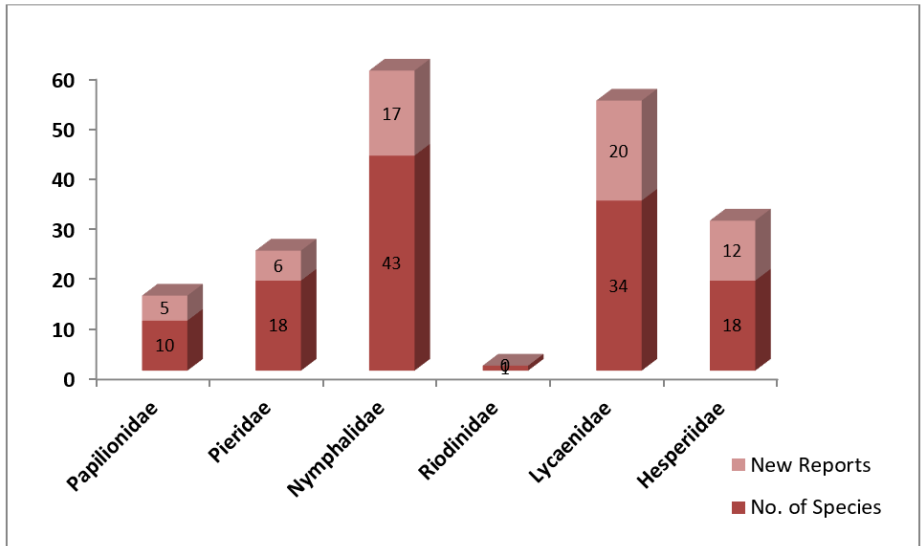


Figure 3. The number of butterfly species encountered with new reports in different families in the PENCH TIGER RESERVE, NAGPUR.

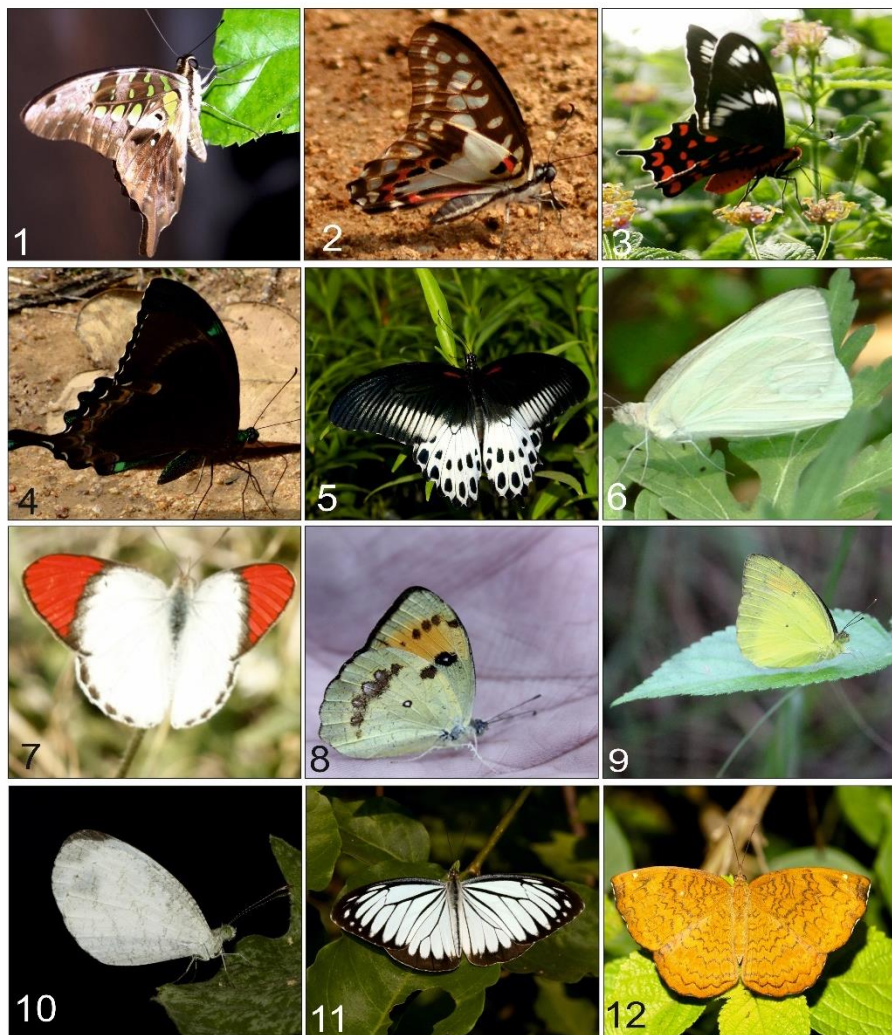


Figure 4. Newly recorded species of butterflies from Pench Tiger Reserve, Nagpur. 1. *Graphium agamemnon* (Linnaeus, 1758); 2. *Graphium doson* (C. & R. Felder, 1864); 3. *Pachliopta hector* (Linnaeus, 1758); 4. *Papilio crino* Fabricius, 1793; 5. *Papilio polymnestor* Cramer, [1775]; 6. *Appias libythea* (Fabricius, 1775); 7. *Colotis danae* (Fabricius, 1775); 8. *Colotis fausta* (Olivier, 1804); 9. *Ixias pyrene* (Linnaeus, 1764); 10. *Leptosia nina* (Fabricius, 1793); 11. *Pareronia anais* (Lesson, 1837); 12. *Ariadne merione* (Cramer, [1777])

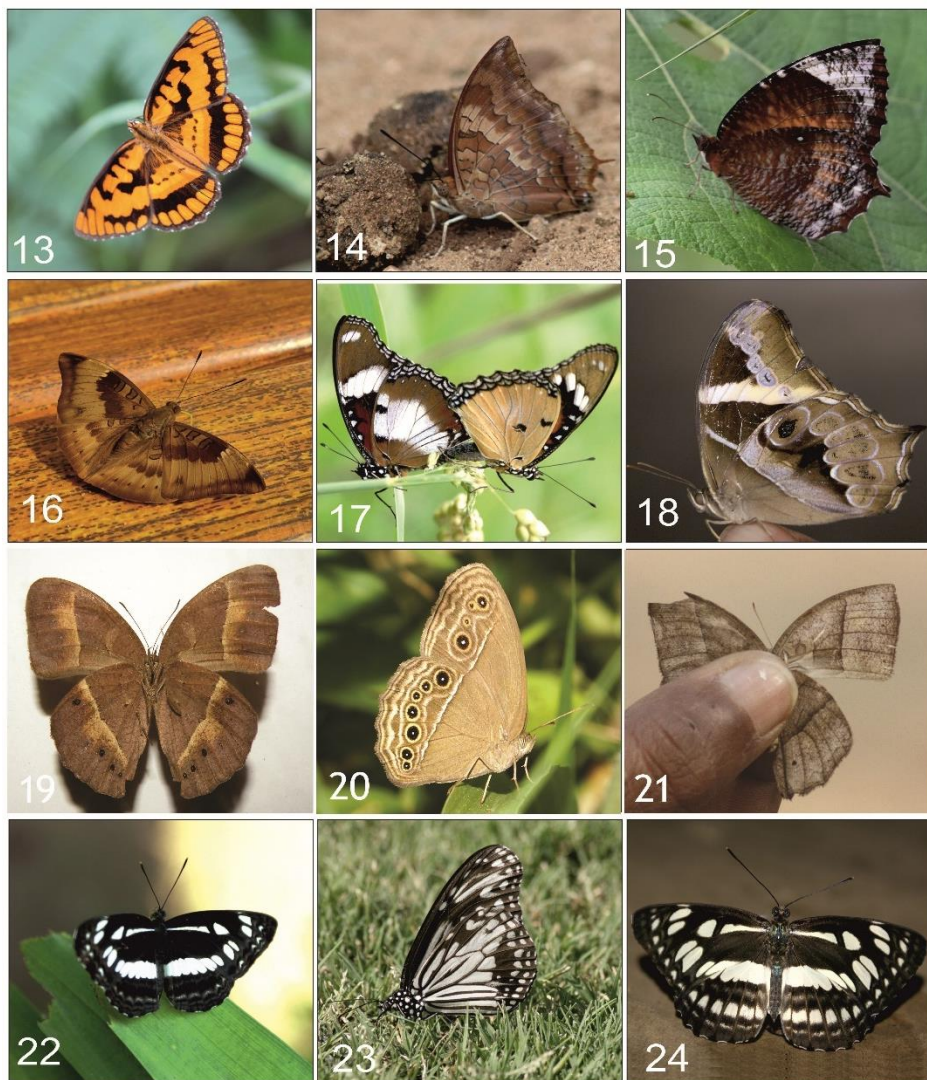


Figure 5. Newly recorded species of butterflies from Pench Tiger Reserve, Nagpur. **13.***Byblia ilithyia* (Drury, [1773]); **14.***Charaxes psaphon* Westwood, 1847; **15.***Elymnias hypermnestra* (Linnaeus, 1763); **16.***Euthalia aconthea* (Cramer, [1777]); **17.** *Hypolimnas misippus* (Linnaeus, 1764); **18.** *Lethe europa* (Fabricius, 1775) **19.***Mycalesis intermedia*(Moore, [1892]); **20.***Mycalesis perseus*(Fabricius, 1775); **21.** *Mycalesis visala* Moore, [1858]; **22.** *Neptis jumbah* Moore, [1858]; **23.** *Parantica aglea* (Stoll, [1782]); **24.***Phaedyma columella* (Cramer, [1780])



Figure 6. Newly recorded species of butterflies from Pench Tiger Reserve, Nagpur. **25.***Polyura agraria* (Swinhoe, 1887); **26.***Polyura athamas* (Drury, [1773]); **27.***Ypthima baldus* (Fabricius, 1775); **28.***Ypthima inica* Hewitson, 1865;**29.** *Abisara bifasciata* Moore, 1877; **30.** *Acyrolepis puspa* (Horsfield, [1828]);**31.***Anthene lycaenina* (Felder, 1868); **32.***Arhopala amantes* (Hewitson, 1862);**33.** *Azanus jesous* (Guérin-Méneville, 1849); **34.** *Azanus ubaldus* (Stoll, [1782]);**35.** *Chilades lajus* (Stoll, [1780]); **36.***Chilades parrhasius* (Fabricius, 1793)

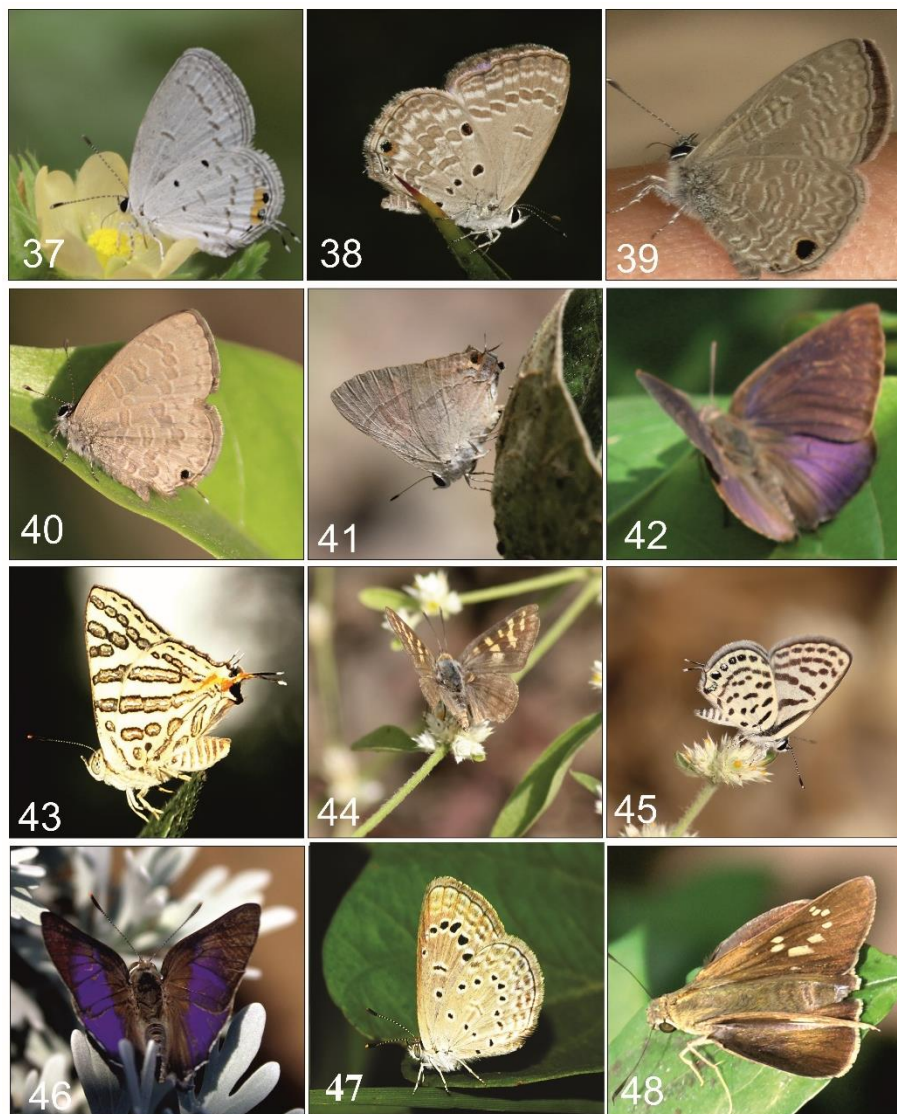


Figure 7. Newly recorded species of butterflies from Pench Tiger Reserve, Nagpur. **37.***Everes lacturnus* (Godart, [1824]); **38.***Luthrodes pandava* (Horsfield, [1829]); **39.***Prosotas dubiosa* (Semper, [1879]); **40.** *Prosotas nora* (C. Felder, 1860); **41.** *Rapala iarbus* (Fabricius, 1787); **42.** *Rapala manea* (Hewitson, 1863); **43.***Spindasis elima* (Moore, 1877); **44.***Spindasis schistacea* (Moore, 1881); **45.** *Tarucus callinara* Butler, 1886; **46.** *Virachola isocrates* (Fabricius, 1793); **47.** *Zizeeria karsandra* (Moore, 1865); **48.***Baoris farri* (Moore, 1878)



Figure 8. Newly recorded species of butterflies from Pench Tiger Reserve, Nagpur. **49.***Borbo cinnara*(Wallace, 1866); **50.***Caltoris kumara*(Moore, 1878); **51.** *Caprona iransonnetii* (Felder, 1868); **52.** *Caprona agama* (Moore, [1858]);**53.** *Coladenia indran*(Moore, [1866]); **54.** *Halpe porus* (Mabille, [1877]);**55.***Jambrix salsala* (Moore, [1866]); **56.***Matapa aria* (Moore, [1866]); **57.** *Pelopidas mathias*(Fabricius, 1798); **58.** *Suastus gremius* (Fabricius, 1798);**59.** *Telicota colon*(Fabricius, 1775); **60.***Udaspes folus* (Cramer, [1775])