BUTTERFLIES OF KHANDIGE WILDLIFE PRESERVATION

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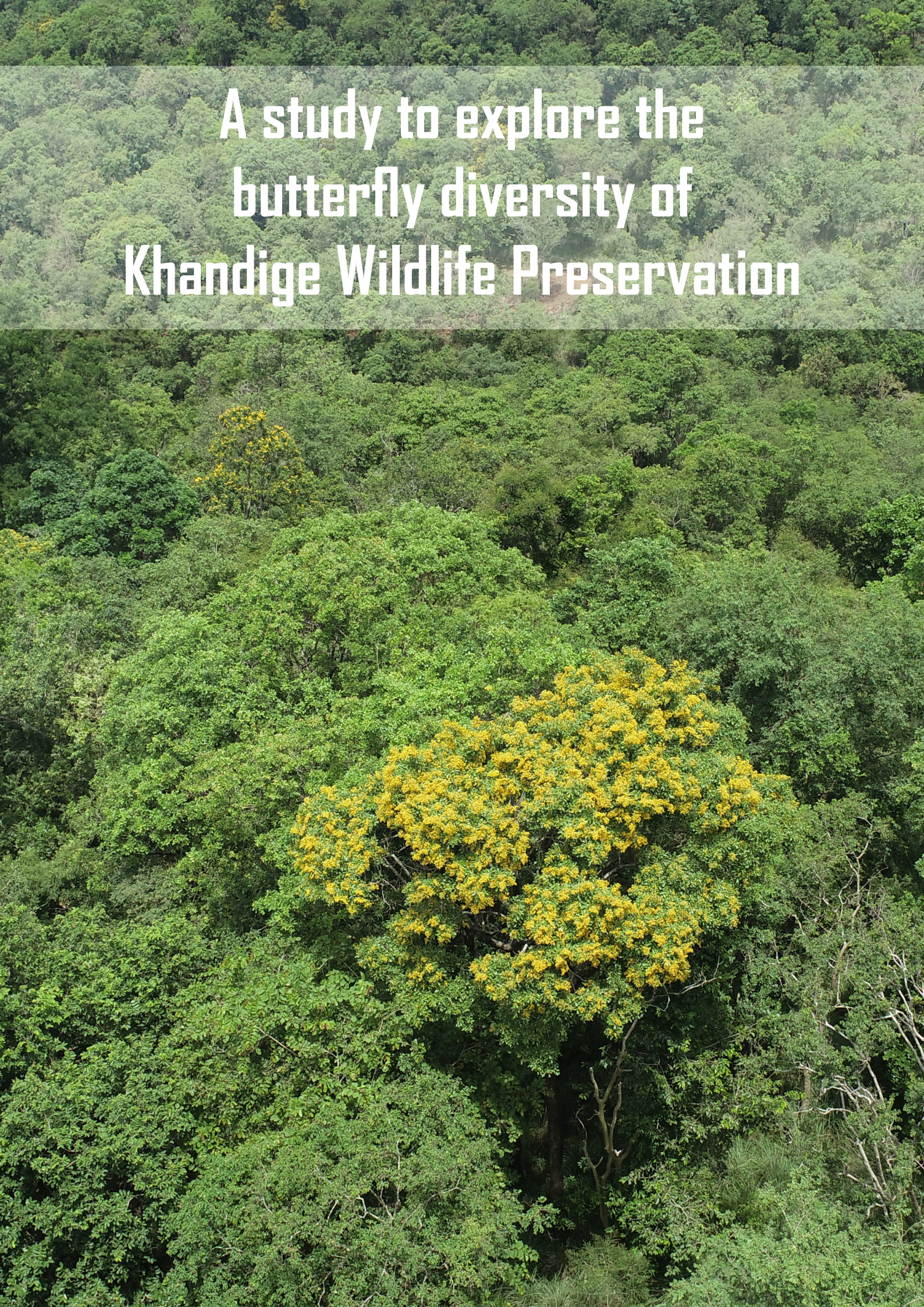
KHANDIGE

WILDLIFE PRESERVATION

A study to explore the butterfly diversity of Khandige Wildlife Preservation



Butterflies of Khandige Wildlife Preservation, Sirumalai hills, Tamil Nadu, Southern India, a preliminary checklist

Report by Kanniyakumari Nature Foundation

Introduction

Biodiversity describes richness of living species on Earth, including plants, animals, bacteria, and fungi. Each of these species works together in an ecosystem like an intricate web, to sustain the life on Earth, that we need to survive. Though Earth's biodiversity is so rich, many species have yet to be discovered, while many species are being threatened with extinction due to human activities. Therefore, Protected Areas (PAs) are designated to conserve the world's Biodiversity (Mariyam et al., 2021). However, PA itself is inadequate to conserve biodiversity in the longterm (Geldmann et al., 2019), because, they are under extensive human pressure (Jones et al., 2018) and less than 10% are structurally connected (Ward et al., 2020). Therefore, a more holistic approach to conservation has required looking beyond the 'closed' box model of protected areas as the only solution to conservation (Kamal et al., 2015). For this reason, it is not pragmatic to convert every track of land into a formally recognized protected area (Figgis, 2004). However, private land (refers to land under private ownership of individuals/families/non-public entities, otherwise informally managed for nature conservation) that is not likely to meet all conservation needs, it substantially contributes to conservation by supplementing additional habitat for wide-ranging wildlife, restoring structural connectivity, strengthening corridors, buffer zone and provide economic benefit through payment for ecosystem service, and eco-tourism (Mariyam et al.,

The Blackvein sergeant - *Athyma ranga*

2021). For instance, 45% of Cost Rica's Biological Reserve and 73.8% of total land within the national park in Great Britain lies in private land, while at least 14 million hectares of private land in Southern Africa are used for wildlife management (Chacon 2005; Krug 2001; NPA UK 2011).

Meanwhile, it is not a novel concept in African and Latin American nations, but in South Asian countries like India, private land conservation is still a relatively new concept (Karanth and Karanth, 2012; Drescher and Brenner, 2018; Capano et al., 2019).

Nevertheless, some people informally manage their land for conserving biodiversity for instance "Save Animals Initiative Wildlife Sanctuary" in Karnataka are well-known private wildlife sanctuary in India. Similarly, Khandige Estate and Eco Project Private Limited have been managing their privately owned land at Sirumalai Hills in Southern India under the moniker Khandige Wildlife Preservation for the past 25 years to conserve the county's biodiversity. We have been commissioned to document the diversity of butterflies at Khandige Wildlife Preservation after 25 years of conservation.

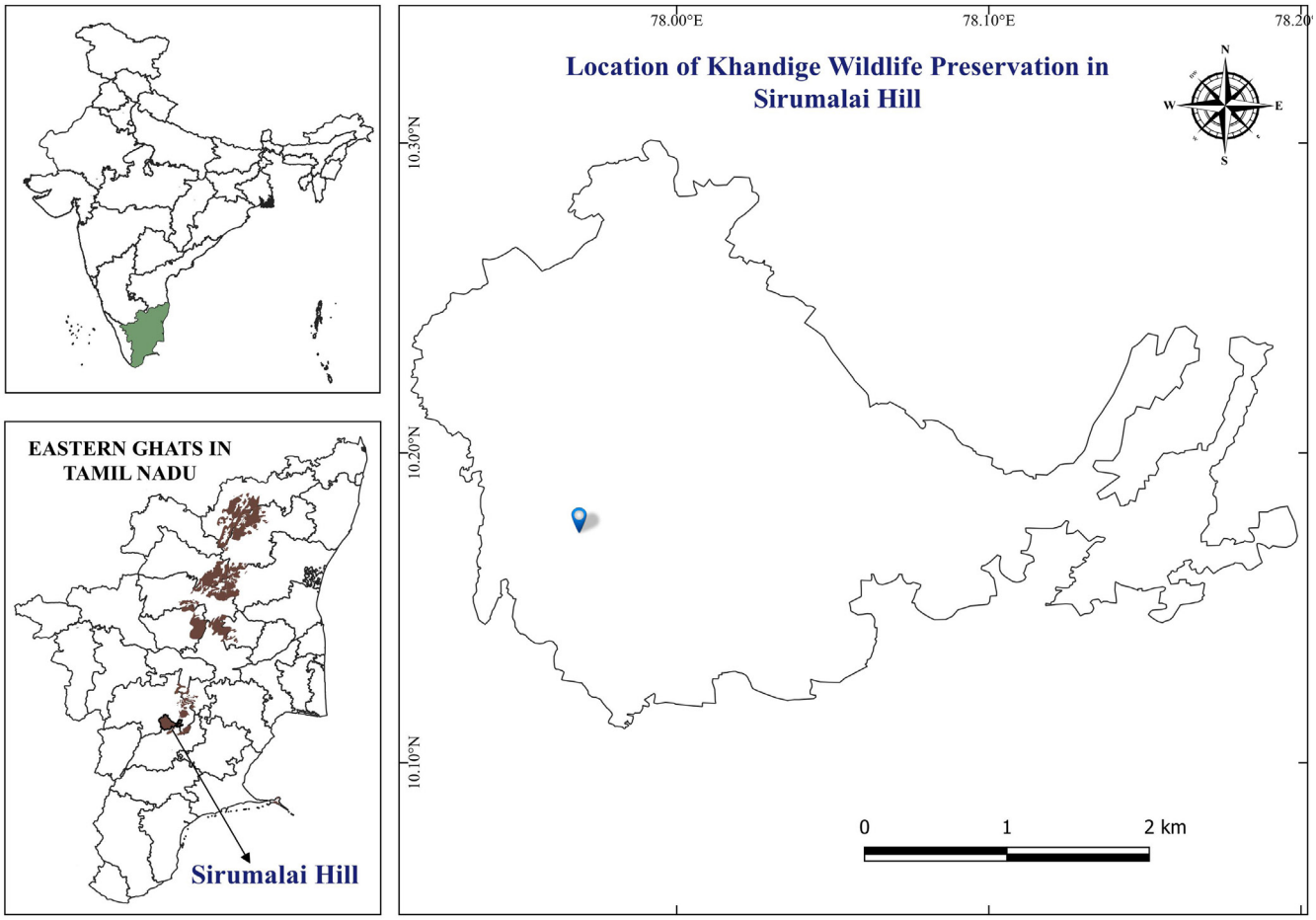


Figure 1. The map shows the location of Khandige Wildlife Preservation (indicated by placeholder) in Sirumalai hills, Tamil Nadu, Southern India.

Butterflies (Rhopalocera) and Moths (Heterocera) are the most admired and easily recognizable insects, together comprise a vast order of insects known as Lepidoptera, a Greek origin word meaning wings with scale (lepis = scale, pteron = wing; Whalley, 2000). A second-largest order of insects comprises nearly 124 families (Dar et al., 2022). Owing to its diverse nature, abundance, inhabiting various land-use categories, being poikilothermic,

and being sensitive to subtle ecological changes, it has been one of the key indicators species to describe the condition of an ecosystem (Naik et al., 2022).

Butterflies can be monitored effortlessly, hence, a systematic study of their population could provide an early warning of environmental changes (Sreekumar and Balakrishnan, 2001;

Mud-puddling butterflies taking advantage of the morning sunshine after the overnight rains.

Naik et al. , 2022). Therefore, it has been considered an umbrella species (New, 1997), thus studies on the population/community ecology of the common butterfly would render critical information on the status of associated species (Pearman and Weber, 2007). However, scanty information on baseline data impedes such detailed ecological investigation that aid to devise strategies for conservation.

Materials and Methods

The Khandige Wildlife Preservation (henceforth KWP) is a private estate spread over an area of 1,000 acres, in Sirumalai hills, Tamil Nadu, Southern India (Fig 1). Sirumalai is the southernmost mountain out of 13 Eastern Ghat hills in Tamil Nadu (Jawadhu, Yelagiri, Shevaroy, Chitteri, Kalrayan, Bodamalai, Kolli, Pachaimalai, Semmalai, Aiyalur, Karandamalai, Sirumalai, and Alagar; Ramachandran et al. 2016). The Sirumalai hill spreads about 300 km^2, and four major ridges gently slope inside and form a plateau known as Pullimathurai. Mullupanrimalai (1,379 m), Vellimalai (1,355 m), Kalugumalai (1,359 m), and Madagamalai (1,245 m) are the major peaks in this region.

The temperature of this region fluctuates from 18.5°C to 29.5°C in January and May, respectively.

Annual rainfall is around 1100 mm, it receives rainfall from both southwest (June - September) and northeast (October - November) monsoon. Sattiar and Kalankaluviar are two smaller streams that drain in Sirumalai and are perennial with a scanty flow during summer (Vanak et al. , 2002). The Kalankaluviar runs through the KWP, where it is joined by two other streamlets forming a series of waterfalls before entering the plains.

Stream inside Khandige Wildlife Preservation

Flora and Fauna – The vegetation of the Sirumalai hills broadly fall under the Tropical Dry Deciduous type (Champion, 1936). Owing to continued human interference, much of the vegetation shows signs of degradation and represents different transitional stages. The entire Sirumalai hill consists of six main vegetation types. Of these only three main types (Dry deciduous forests, Dry evergreen forests, and Riparian forests) occur in KWP. Vanaket al., in the year 2002 reported 29 species of butterflies, nine species of ants, five species of amphibians, 21 species of reptiles, 67 species of birds, and 27 species of mammals from KWP, which can be obtained from www.khandigewildlife.org. Endangered Asiatic wild dog or Indian dhole was reported from KWP (Krishnakumar and Eric, 2020). After 25 years of conservation, a second biodiversity survey is being carried out, therefore, the final report will provide comprehensive details about the flora and fauna of KWP.

As there is little human interference in the Khandige estate, the forest has grown at its own

pace for the past 25 years which has resulted in the diversity of flora inside the estate.

The survey is also a step toward creating a comprehensive butterfly checklist so that the data could be monitored for future trends. Since the primary aim of the study was to obtain the species checklist from KWP, we collected data for three days from 18th June 2022

Regenerated forests of Khandige Wildlife Preservation

to 20th June 2022, using the "Pollard Walk" method (Pollard, 1993). The study area has an elaborate network of roads which also acts as a fire line to avert further spread.

We used this network of roads as transects to cover the study area. Every morning one section of the area was covered; in such a way the entire area was surveyed. As butterflies are more active in the sunlight (Wittman et al., 2017), and with exceptional rains and gloomy skies during the early and late hours of the day, data was gathered from the morning at 8:00 am to the evening 3:00 pm.

Butterflies sighted along the transect were recorded and photographed using Canon EOS

Roads inside KWP also acts as a fire line.

80D - Canon EF 100-400 mm and Sony RX10 IV wherever possible. For species that could not be identified on the field, photographs were used to identify and corroborated using literature (Bhakare et al., 2018). The minimum and maximum temperatures during the study period were 19.9° C and 27.6° C respectively.

Result and Discussion

A total of 106 species of butterflies belonging to five families (Hesperiidae, Lycaenidae, Nymphalidae, Papilionidae, Pieridae, Riodinidae) were recorded from KWP. In which 39 species belonged to Nymphaidae, while Riodinidae represented one species (Fig 2). Crimson Rose *Pachlopta hector*, Common Pierrot *Castalius rosimon*, Lime Blue *Chilades lajus*, Cornelian *Deudorix epijarbas*, Striped Tiger *Danaus genutia* and Danaid Eggfly *Hypolimnas misippus* were recorded in the study area listed in Schedule I of the Indian Wildlife (Protection) Act 1972, while species listed under Schedule II (n = 13) and IV (n = 2) also sighted during the study period (Table 1, Image 1-106).

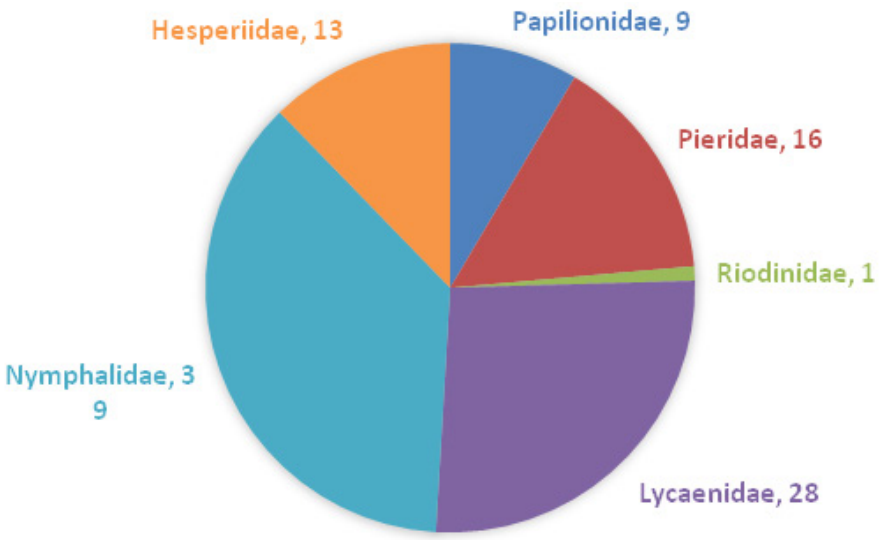
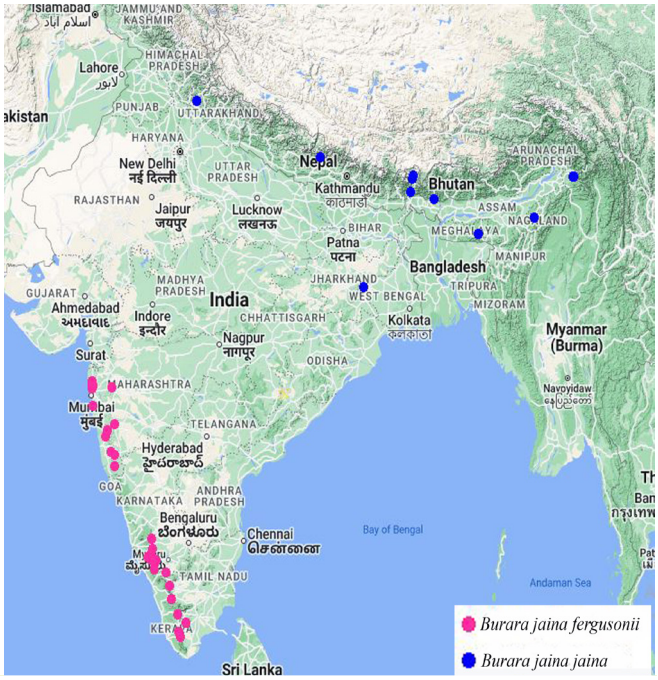


Figure 2. Family-wise composition of butterflies in Khandige Wildlife Preservation, Sirumalai hills, Tamil Nadu.

It's interesting to note that we sighted an Orange awlet, *Burarajaina fergusonii*. *Burara j. Astimata, B. j. Fergusonii* and *B. j. Jaina* are three subspecies found within Indian limits (Das et al., 2020). *Burara j. astigmata* confined to South Andaman, whereas, *B. j. fergusonii* occurs from North Maharashtra to South-Western India, while *B. j. Jainais* known to be spanning from Himachal Pradesh to North-East India and outside the Indian boundary, it is found in Nepal, Bhutan, North-East Bangladesh, Myanmar, Northern Thailand, Northern Laos, North Vietnam, Yunnan and Hainan (Varshney and Smetacek, 2015; Inayoshi, 2019).

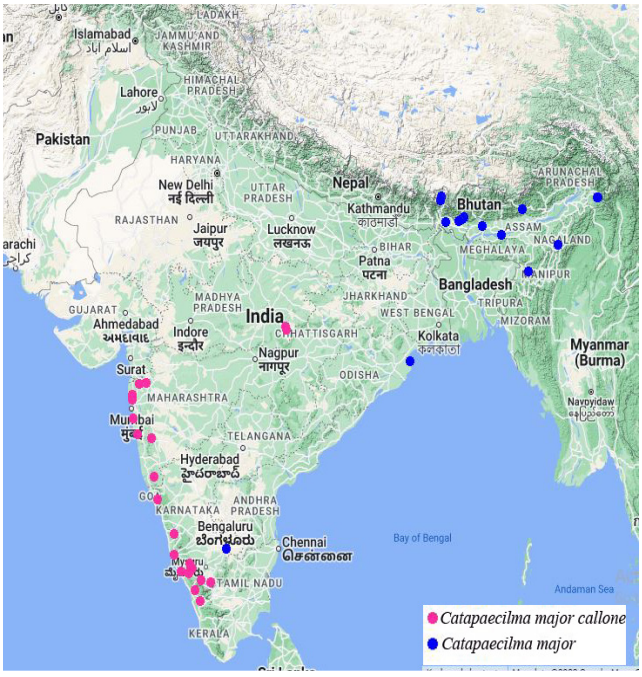
The *B. j. fergusonii* was photographed by the first two authors at 17:17 hours (18.06.2022) and 16:32 hours (20.06.2022).



The present distribution of Orange awlet (*Burara jaina*) and their subspecies in India.
[Distribution map of Orange awlet retrieved from https://www.ifoundbutterflies.org/burara-jaina, accessed 20/08/2022].

The current observation is the first to be recorded in the Eastern Ghats, and we speculate that, *Burarajaina fergusonii*, an endemic species of the Western Ghats may also be found in other Eastern Ghats hills in Tamil Nadu. Similarly, Common Tinsel *Catapaecilma major* was also sighted.

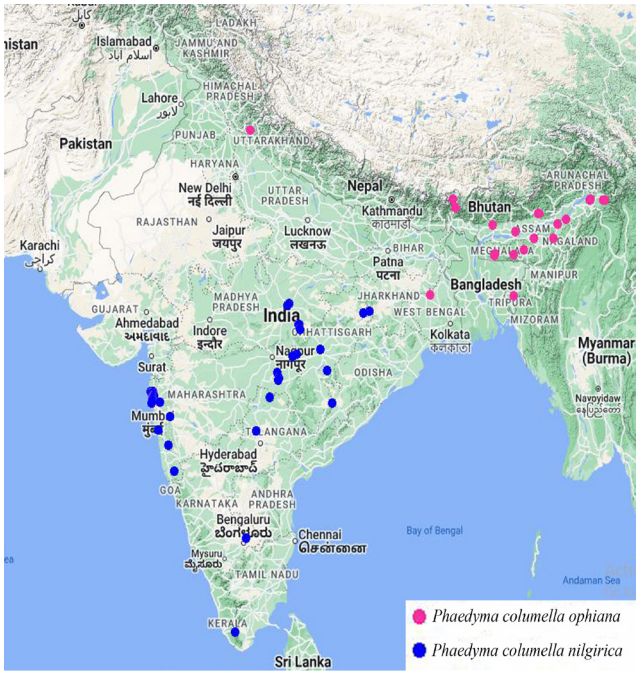
It is known to occur in the Western Ghats from Maharashtra to Kerala (Varshney and Smetacek, 2015; Anonymous 2022). Out of its known range, it has been reported at Yercaud



The present distribution of Common tinsel (*Catapaecilma major*) and their subspecies in India.
[Distribution map of Common tinsel retrieved from https://www.ifoundbutterflies.org/catapaecilma-major, accessed 20/08/2022].

hills, Eastern Ghats, Tamil Nadu (Staff reporter 2020), which lies roughly 180 Km (aerial distance) from the current study area. Palani hill (Western Ghats) is the closest location where Evans (1910), Ghorpade and Kunte (2010) had reported this species.

Phaedymacolumella nilgirica, commonly called a Short-banded sailer was also sighted in KWP. This subspecies' known distribution extends from Gujarat to Kerala in the south, and



The present distribution of Short-banded Sailer (*Phaedyma columella*) and their subspecies in India.
[Distribution map of short-banded sailer retrieved from https://www.ifoundbutterflies.org/phaedyma-columella,accessed 20/08/2022].

West Bengal in the East. Hitherto, it has not been reported in the Eastern Ghats, hence it is the first report in the Eastern Ghats of Tamil Nadu.

Conclusion

As anticipated, the study area has a high diversity of butterflies, accounting for roughly one-third of Tamil Nadu's butterfly diversity. This is because the study area is close to the Western Ghats, we found species that only occurs in that region. Owing to seasonal influence, it is impossible to produce a comprehensive list of butterflies in any given month of the year. Further, unseasonal summer rains during fieldwork might have influenced the outcome of the present study.

Therefore, at least two such investigations must be conducted, each in a distinct season for a complete checklist. The riparian region around the river holds much promise for many more exciting finds in the future. The fact that such diversity exists in a small area within the Eastern Ghats is an encouraging sign and also calls for immediate conservation efforts in the remaining Eastern Ghats hills of Tamil Nadu.

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Table 1. List of species observed during the study period at Khandige Wildlife Preservation, Sirumalai, Tamil Nadu. Common and species names follow Kunte et al., (2022).

Common name	Scientific name	Day 1	Day 2	Day 3	Conservation and Special Status		
					IUCN Red List	Wildlife (Protection) Act, 1972	CITES
Papilionidae - swallowtail butterflies							
Narrow-banded Bluebottle	*Graphium teredon*	+	+	+	NE	NLP	NL
Common Jay	*Graphium doson*	+	-	-	NE	NLP	NL
Tailed Jay	*Graphium agamemnon*	+	+	+	NE	NLP	NL
Common Mormon Swallowtail	*Papilio polytes*	+	+	+	NE	NLP	NL
Blue Mormon Swallowtail	*Papilio polymnestor*	+	+	+	NE	NLP	NL
Lime Swallowtail	*Papilio demoleus*	+	+	+	NA	NLP	NL
Crimson Rose	*Pachliopta hector*	+	+	-	LC	Schedule I	NL
Common Rose Swallowtail	*Pachliopta aristolochiae*	+	-	-	LC	NLP	NL
Southern Birdwing	*Troides minos*	+	+	+	LC	NLP	II
Pieridae - yellow and white butterflies							
Common Gull	*Cepora nerissa*	+	+	+	NE	Schedule II	NL
Striped Albatross	*Appias libythea*	+	-	-	NE	Schedule IV	NL
Common Albatross	*Appias albina*	+	+	+	NE	Schedule II	NL
Lemon Emigrant	*Catopsilia pomona*	+	+	+	NE	NLP	NL
Small Grass Yellow	*Eurema brigitta*	+	+	+	LC	NLP	NL
Common Grass Yellow	*Eurema hecabe*	+	+	+	NE	NLP	NL
Three-spotted Grass Yellow	*Eurema blanda*	+	+	+	NE	NLP	NL
Great Orange Tip	*Hebomoia glaucippe*	-	+	-	NE	NLP	NL
Pioneer	*Belenois aurota*	-	+	+	NE	NLP	NL
Yellow Orange Tip	*Ixias pyrene*	-	-	+	NE	NLP	NL
Common Jezebel	*Delias eucharis*	-	-	+	NE	NLP	NL
Psyche	*Leptosia nina*	-	-	+	NE	NLP	NL
Plain Orange-Tip	*Colotis aurora*	-	-	+	NE	NLP	NL
Indian Wanderer	*Pareronia hippia*	-	-	+	NE	NLP	NL
Indian Sunbeam	*Curetis thetis*	-	-	+	NE	NLP	NL
Mottled Emigrant	*Catopsilia pyranthe*	-	+	-	NE	NLP	NL
Riodinidae - Punches & judies							
Double-banded Judy	*Abisara bifasciata*	+	-	-	NE	NLP	NL
Lycaenidae - Blues, Hairstreaks and Gossamer-winged butterflies							
Red Pierrot	*Talicada nyseus*	+	-	-	NE	NLP	NL
Angled Pierrot	*Caleta decidia*	+	+	+	NE	NLP	NL
Common Pierrot	*Castalius rosimon*	+	+	+	NE	Schedule I	NL
Plain Hedge Blue	*Celastrina lavendularis*	+	+	+	NE	NLP	NL
Lime Blue	*Chilades lajus*	+	-	-	NE	Schedule I	NL
Indian Cupid	*Everes lacturnus*	+	+	-	NE	NLP	NL
Dark Grass Blue	*Zizeeria karsandra*	+	+	+	NE	NLP	NL
Lesser Grass Blue	*Zizina otis*	+	+	+	LC	NLP	NL
Pale Grass Blue	*Pseudozizeeria maha*	+	+	+	NE	NLP	NL
Tiny Grass Blue	*Zizula hylax*	+	+	+	NE	NLP	NL

Tailless Lineblue	*Prosotas dubiosa*	+	+	+	NE	NLP	NL
Common Lineblue	*Prosotas nora*	+	+	+	NE	Schedule II	NL
Purple Leaf Blue	*Amblypodia anita*	+	-	-	NE	Schedule II	NL
Large Oakblue	*Arhopala amantes*	+	-	-	NE	NLP	NL
Centaur Oakblue	*Arhopala centaurus*	+	+	-	NE	Schedule II	NL
Common Tinsel	*Catapaecilma major*	+	-	-	NE	NLP	NL
Cornelian	*Deudorix epijarbas*	+	-	-	NE	Schedule I	NL
Indigo Flash	*Rapala varuna*	+	-	-	NE	Schedule II	NL
Pointed Ciliate Blue	*Anthene lycaenina*	-	+	-	NE	Schedule II	NL
Apefly	*Spalgis epius*	-	+	-	NE	NLP	NL
Common Hedge Blue	*Acytolepis puspa*	-	+	-	NE	NLP	NL
Forget-me-not	*Catochrysops strabo*	-	-	-	NE	NLP	NL
Common Cerulean	*Jamides celeno*	-	+	-	NE	NLP	NL
Zebra Blue	*Leptotes plinius*	-	+	-	NE	NLP	NL
Pea Blue	*Lampides boeticus*	-	+	-	LC	Schedule II	NL
Gram Blue	*Euchrysops cnejus*	-	+	-	NE	Schedule II	NL
Malayan	*Megisba malaya*	-	+	-	NE	Schedule II	NL
Plains Cupid	*Chilades pandava*	-	-	+	NE	NLP	NL
Nymphalidae - Brush-footed butterflies							
Club Beak	*Libythea myrrha*	+	-	-	NE	NLP	NL
Glassy Tiger	*Parantica aglea*	+	-	-	NE	NLP	NL
Dark Blue Tiger	*Tirumala septentrionis*	+	-	-	NE	NLP	NL
Striped Tiger	*Danaus genutia*	+	+	+	NE	Schedule I	NL
Common Crow	*Euploea core*	+	+	-	NE	NLP	NL
Double-branded Crow	*Euploea sylvester*	+	-	-	NE	NLP	NL
Indian Nawab	*Charaxes bharata*	+	+	+	NE	NLP	NL
Malabar Glad-eye Bushbrown	*Mycalesis junonia*	+	+	+	NE	NLP	NL
PalniBushbrown	*Telinga davisoni*	+	+	-	NE	NLP	NL
Tamil Treebrown	*Lethe drypetis*	+	+	-	NE	NLP	NL
Common Five-Ring	*Ypthima baldus*	+	+	-	NE	NLP	NL
Common Four-Ring	*Ypthima huebneri*	+	+	-	NE	NLP	NL
White Four Ring	*Ypthima ceylonica*	+	+	-	NE	NLP	NL
Common Evening Brown	*Melanitis leda*	+	-	-	LC	NLP	NL
Rustic	*Cupha erymanthis*	+	-	-	NE	NLP	NL
Common Leopard	*Phalanta phalantha*	+	-	-	LC	NLP	NL
Commander	*Moduza procris*	+	-	-	NE	NLP	NL
Blackvein Sergeant	*Athyma ranga*	+	-	-	NE	Schedule II	NL
Common Lascar	*Pantoporia hordonia*	+	+	-	NE	NLP	NL
Common Sailer	*Neptis hylas*	+	+	-	NE	NLP	NL
Chestnut-streaked Sailer	*Neptis jumbah*	+	-	-	NE	NLP	NL
Clear Sailer	*Neptis nata*	+	-	-	NE	Schedule II	NL
Angled Castor	*Ariadne ariadne*	+	+	-	NE	NLP	NL
Common Castor	*Ariadne merione*	+	+	-	NE	NLP	NL
Blue Admiral	*Kaniska canace*	+	-	-	NE	NLP	NL
Grey Pansy	*Junonia atlites*	+	-	-	NE	NLP	NL

Chocolate Pansy	*Junonia iphita*	+	+	-	NE	NLP	NL
Great Eggfly	*Hypolimnas bolina*	+	-	-	NE	NLP	NL
Short Banded Sailer	*Phaedyma columella*	+	-	-	NE	NLP	NL
Tamil Yeoman	*Cirrochroa thais*	-	+	-	NE	NLP	NL
Tawny Rajah	*Charaxes bernardus*	-	+	-	NE	Schedule II	NL
Yellow Pansy	*Junonia hierta*	-	+	-	LC	NLP	NL
Lemon Pansy	*Junonia lemonias*	-	+	-	NE	NLP	NL
Plain Tiger	*Danaus chrysippus*	-	+	-	LC	NLP	NL
Blue Tiger	*Tirumala limniace*	-	+	+	NE	NLP	NL
Tawny Coster	*Acraea terpsicore*	-	-	+	NE	NLP	NL
Common Treebrown	*Lethe rohria*	-	-	+	NE	NLP	NL
Tamil Bushbrown	*Mycalesis subdita*	-	-	+	NE	NLP	NL
Danaid Eggfly	*Hypolimnas misippus*	-	-	+	NE	Schedule I	NL
Hesperiidae - Skipper butterflies							
Common Orange Awlet	*Burara jaina*	+	-	-	NE	NLP	NL
White Banded Awl	*Hasorata minatus*	+	-	-	NE	NLP	NL
Small branded swift	*Pelopidas mathias*	+	-	+	NE	NLP	NL
Chestnut Bob	*Iambrix salsala*	+	+	+	NE	NLP	NL
Dark Palm-Dart	*Telicota bambusae*	+	+	-	NE	NLP	NL
Tree Flitter	*Hyarotis adrastus*	+	-	-	NE	Schedule IV	NL
Tamil grass dart	*Taractrocera ceramas*	+	-	+	NE	NLP	NL
Common Spotted Flat	*Celaenorrhinus leucocera*	+	+	-	NE	NLP	NL
Fulvous Pied Flat	*Pseudocoladenia dan*	+	-	-	NE	NLP	NL
Restricted Demon	*Notocrypta curvifascia*	-	+	-	NE	NLP	NL
Common Banded Demon	*Notocrypta paralysos*	-	+	+	NE	NLP	NL
Indian Dartlet	*Oriens goloides*	+	-	+	NE	NLP	NL
Moore's ace	*Halpe porus*	-	-	+	NE	NLP	NL

LC – Least Concern; NA – Not Applicable; NE – Not Evaluated; NLP – Not legally Protected; NL – Not Listed.

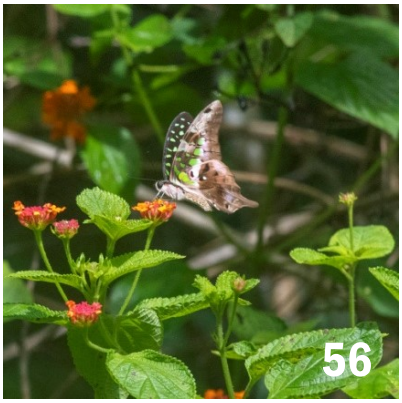
Appendix of images of butterflies taken during the survey

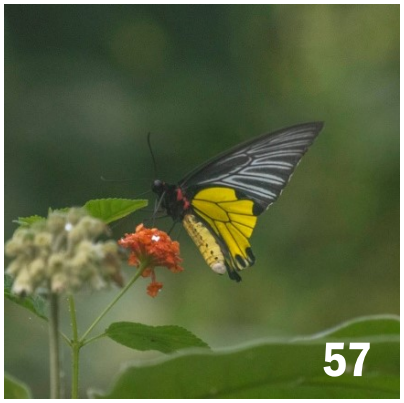
1. Tailless Lineblue -*Prosotas dubiosa* | **2.** Tamil Bushbrown - *Mycalesis subdita* | **3.** Tamil Grass Dart - *Taractrocera ceramas* | **4.** Common Five-ring - *Ypthima baldus* | **5.** Red Pierrot - *Talicada nyseus* | **6.** Striped Tiger - *Danaus genutia* | **7.** Common Grass Yellow - *Eurema hecabe* | **8.** Clear Sailer - *Neptis nata* **9.** Palni Bushbrown - *Telinga davisoni* | **10.** Common Pierrot - *Castalius rosimon* | **11.** Dark Palm-Dart - *Telicota bambusae* | **12.** Plain Orange-tip - *Colotis aurora* | © Vinod Sadhasivan & Paulmathi Vinod.

13. Angled Pierrot - *Caleta decidia* | **14.** Double-branded Crow - *Euploea sylvester* | **15.** Common Treebrown - *Lethe rohria* | **16.** Common Lascar - *Pantoporia hordonia* | **17.** Common Nawab - *Charaxes bharata* | **18.** Common Sailer - *Neptis hylas* | **19.** Common Leopard - *Phalanta phalantha* | **20** Common Emigrant - *Catopsilia pomona* | **21.** Common Banded Demon - *Notocrypta paralysos* | **22.** Orange awlet - *Burara jaina* | **23.** Black-vein Sergeant - *Athyma ranga* | **24.** Common Albatross - *Appias albina* | © Vinod Sadhasivan & Paulmathi Vinod.

25. Plain Tiger - *Danaus chrysippus* | **26.** Great Eggfly - *Hypolimnas bolina* | **27.** White Banded Awl - *Hasora taminatus* | **28.** Plains Cupid - *Chilades pandava* | **29.** Large Oakblue - *Arhopala amantes* | **30.** Indian Tawny Rajah - *Charaxes bernardus* | **31.** Common Castor - *Ariadne merione* | **32.** Pale Grass Blue - *Pseudozizeeria maha* | **33.** Malayan - *Megisba malaya* | **34** Blue Tiger - *Tirumala limniace* | **35.** Plain Hedge Blue - *Celastrina lavendularis* | **36.** Common Cerulean - *Jamides celeno* | © Vinod Sadhasivan & Paulmathi Vinod.

37. Common Hedge Blue - *Acytolepis puspa* | **38.** Angled Castor - *Ariadne ariadne* | **39.** Blue Admiral - *Kaniska canace* | **40.** Yellow Orange-tip - *Ixias pyrene* | **41.** Blue Mormon - *Papilio polymnestor* | **42.** Chestnut Bob - *Iambrix salsala* | **43.** Dark Grass Blue - *Zizeeria karsandra* | **44.** Club Beak - *Libythea myrrha* 45. Commander - *Moduza procris* | **46.** Common Mormon - *Papilio polytes* | **47.** Common Four-ring - *Ypthima huebneri* | **48** Apefly - *Spalgis epius* | © Vinod Sadhasivan & Paulmathi Vinod.

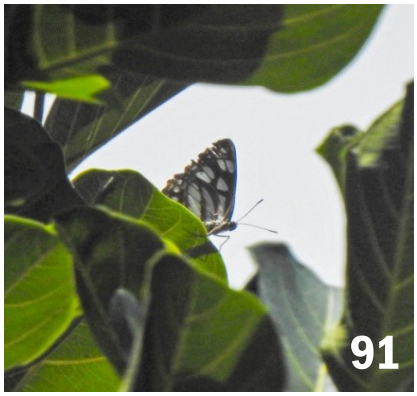


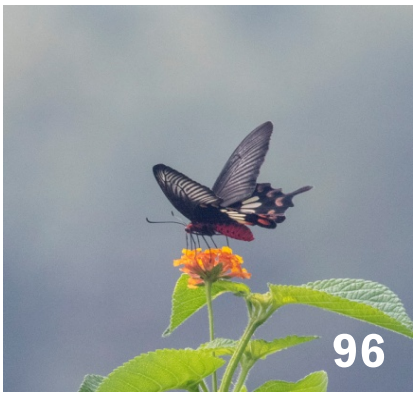


49. Moore's Ace - *Halpe porus* | **50.** White Four-ring - *Ypthima ceylonica* | **51.** Common Crow - *Euploea core* | **52.** Indian Dartlet - *Oriens goloides* | **53.** Tiny Grass Blue - *Zizula hylax* | **54.** Three-spot Grass Yellow - *Eurema blanda* | **55.** Indian Cupid - *Everes lacturnus* | **56.** Tailed Jay - *Graphium agamemnon* | **57.** Southern Birdwing - *Troides minos* | **58.** Glassy Tiger - *Parantica aglea* | **59.** Pointed Ciliate Blue - *Anthene lycaenina* | **60.** Common Gull - *Cepora nerissa* |

61. Common Jay - *Graphium doson* | **62.** Danaid Eggfly - *Hypolimnas misippus* | **63.** Yellow Pansy - *Junonia hierta* | **64.** Forget-me-not - *Catochrysops strabo* | **65.** Small Grass Yellow - *Eurema brigitta* | **66.** Tawny Coster - *Acraea terpsicore* | **67.** Purple Leaf Blue - *Amblypodia anita* | **68.** Mottled Emigrant - *Catopsilia pyranthe* | **69**. Lime Butterfly - *Papilio demoleus* | **70.** Tree Flitter - *Hyarotis adrastus* | **71.** Lime Blue - *Chilades lajus* | **72.** Gram Blue - *Euchrysops cnejus* | © Vinod Sadhasivan & Paulmathi Vinod.

73. Common Tinsel - *Catapaecilma major* | **74.** Grey Pansy - *Junonia atlites* | **75.** Tamil Treebrown - *Lethe drypetis* | **76.** Southern Bluebottle - *Graphium teredon* | **77.** Rustic - *Cupha erymanthis* | **78** Fulvous Pied Flat - *Pseudocoladenia dan* | **79.** Common Jezebel - *Delias eucharis* | **80.** Cornelian - *Deudorix epijarbas* | **81**. Common Evening Brown - *Melanitis leda* | **82.** Double-banded Judy - *Abisara bifasciata* | **83.** Lemon Pansy - *Junonia lemonias* | **84.** Chestnut-streaked Sailer - *Neptis jumbah* | © Vinod Sadhasivan & Paulmathi Vinod.





85. Restricted Demon - *Notocrypta curvifascia* | **86.** Malabar Glad-eye Bushbrown - *Mycalesis junonia* | **87.** Great Orange-tip - *Hebomoia glaucippe* | **88.** Small Branded swift - *Pelopidas mathias* | **89.** Pea Blue - *Lampides boeticus* | **90.** Tamil Yeoman - *Cirrochroa thais* | **91.** Short-banded Sailer - *Neptis columella* | **92.** Pioneer - *Belenois aurota* | **93.** Lesser Grass Blue - *Zizina otis* | **94.** Centaur Oakblue - *Arhopala centaurus* | **95.** Chocolate Pansy - *Junonia iphita* | **96.** Common Rose - *Pachliopta aristolochiae* | © Vinod Sadhasivan & Paulmathi Vinod.

97. Striped Albatross - *Appias libythea* | **98.** Common Small Flat - *Sarangesa dasahara* | **99.** Common Lineblue - *Prosotas nora* | **100** Indian Sunbeam - *Curetis thetis* | **101.** Common Wanderer - *Pareronia hippia* | **102.** Psyche - *Leptosia nina* | **103.** Crimson Rose - *pachliopta hector* | **104.** Indigo Flash - *Rapala varuna* | **105.** Zebra Blue - *Leptotes plinius* | **106.** Dark Blue Tiger - *Tirumala septentrionis* | © Vinod Sadhasivan & Paulmathi Vinod.

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