



Diversity and community structure of butterflies in someshwara wildlife sanctuary, Karnataka, India

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Abstract

The present study was carried out with a view to generate quantitative data about the butterfly population across Someshwara wildlife sanctuary, thereby leading to their conservation. The sanctuary is a mixture of semi-evergreen and evergreen forest; is a part of Western Ghat located in Udupi district of Karnataka (between 13°29' to 13°37' N latitude and 74°50' to 75°05' E longitude). This 88.4 sq. km forest was declared as a wildlife sanctuary in 1974. A preliminary data collection was done for one year by frequently visiting the park in pre-monsoon (April - May) and post-monsoon seasons (November - December). Here we report a total count of 130 species of butterflies. They definitely are a significant contributor in local food chain. A few species have also been categorized under Wildlife Protection Act, 1972. The authors expect that the species richness would probably be around 150 - 200. The probable constrain has been very little information available on these creatures of the said less popular area and very few localized studies on their population and seasonal occurrence. The forest has a potential to serve as a butterfly diversity hotspot, on the grounds similar to North Eastern evergreen forests of India. The current baseline study certainly underlines the importance of the sanctuary as an important reserve for butterfly conservation. The study will work as a ground work for further research. It will certainly help the local policy makers to develop certain policies for conservation of these life forms and protect the whole environment.

Keywords: lepidoptera, conservation, biodiversity, western ghat

Introduction

Butterflies are recognized as one of the most widespread and widely documented and one of the best taxonomically studied insects in the world. (Robbins, RK; Opler, PA (1997) ^[5] they are one of the crucial components of ecosystems. They act as plant pollinators and weed controllers. (Tiple *et al.* 2006) ^[7] Butterflies are very sensitive to environmental degradation and climatic changes due to their shorter life cycle than higher animals and quickness to react to slight environmental fluctuations. (Lafontaine JD (1997) ^[4] Hence they are considered as good biological indicators of climatic changes. (Kunte 2000) ^[2]. Out of the 1501 species of these 'living jewels' found in India, approximately 735 are found in Indian subcontinent.

The present study was carried out with a view to generate quantitative data about the butterfly population across Someshwara wildlife sanctuary. The semi-evergreen and evergreen forest is a part of Western ghat located in Udupi district of Karnataka. This 88.4 sq. km forest was declared as a wildlife sanctuary in 1974. This sanctuary is situated about 40 km from Udupi on Mangalore- Karkala-Agumbe Road. *Machilus macrantha*, *Lophopetalum wightanum* and *Artocarpus hirsuta* are some of the characteristic medicinal floral species of found in this sanctuary. This paper attempts to document the butterfly richness found in the sanctuary.

Study area

Someshwara wildlife sanctuary is located between 13°29' to 13°37' N latitude and 74°50' to 75°05' E longitude. The sanctuary

covers western slopes of Western Ghats. Terrain is hilly and very undulating. Weather is cooler during monsoon and up to December. It becomes increasingly hot and sultry from January onwards till the onset of southwest monsoons. Proximity to sea indicates high humidity. Temperature generally varies between 20 to 35°C. The area experiences south west monsoon from July to September. North east monsoon is much less intensive. This rainfall is the sole water source to fulfil the rivers and streams within the park. Water may become scarce during January till April.

Data Collection

A preliminary data collection was done by visiting the park in different seasons. The procedure involved walking along the forest tracks with a constant speed and recording the butterflies that are seen in front and on sides. Pre-existing forest tracks were used for survey. The observations indicating abundance and seasonality is based on survey done during morning hours (8 am to 11 am) when the butterflies are on their wing. Butterfly species identified were recorded. Species difficult to identify were photographed and identified later using various guide books and literature. Specimen collection was avoided. The larval host plants were given special attention to search butterfly eggs, caterpillars and pupa. Species classification and scientific names are given as per K Kunte, *et al* in Butterflies of India, v. 2.10.

Table 1: Checklist of the species of butterfly recorded in the study area.

Sr. No.	Common Name	Scientific Name	Occurrence
Family: Papilionidae			
1	Common mormon	<i>Papilio polymnestor</i> Linn.	Common
2	Common rose	<i>Pachiliopta aristolochiae</i> Fab.	Occasional
3	Crimson rose	<i>Pachiliopta hector</i> L.	Occasional
4	Paris peacock	<i>Papilio paris</i>	Occasional
5	Blue mormon	<i>Papilio polymenester</i> Cramer	Occasional
6	Malabar banded peacock	<i>Papilio buddha</i>	Occasional
7	Common Jay	<i>Graphium doson</i> Feeder	Common
8	Tailed Jay	<i>Graphium gamemnon</i> Linn.	Occasional
9	Common bluebottle	<i>Graphium sarpedon</i>	Common
10	Common mime	<i>Papilio clytia</i> L.	Occasional
11	Lime butterfly	<i>Papilio demoleus</i> Linn.	Common
12	Southern birdwing	<i>Troides minos</i> Cramer	Occasional
13	Red helen	<i>Papilio helenus</i> L.	Occasional
14	Malabar swallowtail	<i>Papilio liomedon</i> Moore	Occasional
Family: Pieridae			
15	Common Grass Yellow	<i>Eurema hecabe</i> Moore	Common
16	One spot Grass Yellow	<i>Eurema andersoni</i> Moore	Common
17	Small Grass Yellow	<i>Eurema lecaeb</i> Linn.	Common
18	Spotless Grass Yellow	<i>Eurema laeta</i> Boisduval	Common
19	Three spot Grass Yellow	<i>Eurema blanda</i> Boisduval	Common
20	Common jezebel	<i>Delias eucharis</i> Drury	Common
21	Common Gull	<i>Cepora nerissa</i> Fabricius	Common
22	Lesser gull	<i>Cepora nadina</i> Lucas	Rare
23	Psyche	<i>Leptosia nina</i>	Common
24	Common emigrant	<i>Catopsilia pomona</i> Fabricius	Common
25	Mottled emigrant	<i>Catopsilia pyraithe</i> Linn.	Common
26	Common wanderer	<i>Pareronia valeria</i> Fabricius	Common
27	Dark wanderer	<i>Pareronia ceylanica</i> Felder	Rare
28	Chocolate albatross	<i>Appias lyncida</i> Cramer	Occasional
29	Common albatross	<i>Appias albina</i> Boisduval	Common
30	Lesser albatross	<i>Appias wardi</i> Moore	Rare
31	Plain orange tip	<i>Colotis eucharis</i>	Occasional
32	Yellow orange tip	<i>Ixias pyrene</i> Linnaeus	Common
33	Great Orange tip	<i>Hebomoia glaucippe</i> L	Occasional
34	Painted sawtooth	<i>Prioneris sita</i> Felder	Occasional
Family: Lycaenidae			
35	Common slate flash	<i>Rapala manea</i> Hewitson	Occasional
36	Yamfly	<i>Loxura atymmus</i> Cramer	Occasional
37	Apefly	<i>Spalgis epius</i> Westwood	Occasional
38	Common pierrot	<i>Castalius rosimon</i> Fabricius	Rare
39	Blue banded pierrot	<i>Discolampa ethion</i> Westwood	Common
40	Dark pierrot	<i>Tarucus ananda de Niceville</i>	Occasional
41	Common Hedgeblue	<i>Acytolepis puspa</i> Horsfield	Common
42	Common Cerulean	<i>Jamides celeno</i> Cramer	Common
43	Plane	<i>Bindahara phocides</i> Fabricius	Occasional
44	Pointed lineblue	<i>Nacaduba helicon</i> Felder	Occasional
45	Common imperial	<i>Cheritra freja</i> Fabricius	Occasional
46	Western Centaur Oakblue	<i>Arhopala pseudocentaurus</i> Doubleday	Occasional
47	Quaker	<i>Neopithecops zalmora</i> Butler	Occasional
48	Angled pierrot	<i>Caleta caleta</i> Hewitson	Occasional
49	Common tinsel	<i>Catapaecilma elegans</i> Druce	Occasional
50	Munkey puzzle	<i>Rathinda anor</i> Fabricius	Common
51	Pale grass blue	<i>Pseudozizeeria maha</i> Kollar	Occasional
52	Common onyx	<i>Horaga onyx</i> Moore	Occasional
53	Indian sunbeam	<i>Curetis thetis</i> Drury	Occasional
54	Common Tinsel	<i>Catapaecilma elegans</i> Druce	Occasional
55	Common Silverline	<i>Cigaritis vulcanus</i> Fabricius	Occasional
56	Common lineblue	<i>Prosotas aluta coelstis</i> Wood-Mason & de Niceville	Occasional
57	Pea blue	<i>Lampides boeticus</i> Linn.	Common
58	Grass jewel	<i>Chilades trochylus</i> Freyer	Common

59	Plains cupid	<i>Chilades pandava</i> Horsfield	Common
Family: Nymphalidae			
60	Tawny Coster	<i>Acraea violae</i> Fabricius	Common
61	Lemon pansy	<i>Junonia lemonias</i> Linn.	Common
62	Blue Pansy	<i>Junonia orithiya</i> Linn.	Occasional
63	Yellow Pansy	<i>Junonia hierta</i> Fabricius	Occasional
64	Nigger	<i>Orsotriaena medus</i> Fabricius	Common
65	Common Bushbrown	<i>Mycalasis perseus</i> Fabricius	Common
66	Tamil Yeoman	<i>Cirrochroa thais</i> Fabricius	Occasional
67	Common Sailer	<i>Neptis hylas</i> Moore	Common
68	Chestnut streaked sailer	<i>Neptis jumbah</i> Moore	Common
69	Common Sergeant	<i>Athyma perius</i> Linn.	Common
70	Black veined sergeant	<i>Athyma ranga</i> Moore	Rare
71	Colour Sergeant	<i>Athyma nefte</i> Cramer	Occasional
72	Common Lascar	<i>Pantoporia hordonia</i> Stoll	Common
73	Tamil Catseye	<i>Orsotriaena medus</i> Fabricius	Rare
74	Black Rajah	<i>Charaxes solon</i> Fabricius	Common
75	Tawny Rajah	<i>Charaxes bernardus</i> Fabricius	Common
76	Peacock pansy	<i>Junonia almana</i> Linn.	Common
77	Chocolate Pansy	<i>Precis iphita</i> Cramer	Common
78	Grey Pansy	<i>Junonia atlites</i> Linn.	Occasional
79	Plain tiger	<i>Danaus chrysippus</i> Linn.	Common
80	Glassy tiger	<i>Parantica aglea</i> Stoll	Common
81	Blue tiger	<i>Tirumala limniace</i> Cramer	Occasional
82	Drak blue tiger	<i>Tirumala septentrionis</i> Butler	Common
83	Cruiser	<i>Vindula arsinoe</i> Cramer	Occasional
84	Common Nawab	<i>Polyura anthamas</i> Drury	Common
85	Anomalous Nawab	<i>Polyura agraria</i> Swinhoe	Occasional
86	Common Indian Crow	<i>Euploea core</i> Cramer	Common
87	Double banded crow	<i>Euploea sylvester</i> Fabricius	Common
88	Tamil Lacewing	<i>Cethosia nietneri</i> Felder	Common
89	Red spot duke	<i>Dophla evelina</i> Stoll	Occasional
90	Great eggfly	<i>Hypolimnas bolina jacintha</i>	Common
91	Danaid eggfly	<i>Hypolimnas misippus</i> L	Common
92	Clipper	<i>Parthenos sylvia</i> Linn.	Occasional
93	Black prince	<i>Rohana parisatis</i> Westwood	Occasional
94	Malabar tree nymph	<i>Idea malabarica</i> Moore	Occasional
95	Common Fourring	<i>Ypthima huebneri</i> Kirby	Common
96	Common Fivering	<i>Ypthima baldus</i> Fabricius	Common
97	Common leopard	<i>Phalanta phalantha</i> Drury	Common
98	Commander	<i>Modusa procris</i> Cramer	Common
99	Grey Count	<i>Tanacea lepida</i> Butler	Common
100	Rustic	<i>Cupha erimanthus</i> Drury	Occasional
101	Common Palmfly	<i>Elymnias hypermnestra</i> Linn.	Common
102	Autumn leaf	<i>Doleschallia bisaltide</i> Cramer	Rare
103	Common castor	<i>Ariadne merione</i> Cramer	Common
104	Common evening brown	<i>Melanitis leda</i> Linn.	Common
105	Common baron	<i>Euthalia aconthea</i> C	Common
106	Baronet	<i>Euthalia nais</i> F	Common
107	Stripped tiger	<i>Danus genutia</i> Cramer	Common
108	Blue oakleaf	<i>Kallima philarchus</i> Westwood	Occasional
Family: Hesperidae			
109	Coon	<i>Psoles fuligo</i> Mabille	Common
110	Madras Ace	<i>Thoressa honorei</i> de Niceville	Rare
111	Common snow flat	<i>Tagiades japetus</i> Stoll	Common
112	Tamil spotted flat	<i>Celaenorrhinus ruficornis</i> Mabille	Common
113	Pigmy scrub hopper	<i>Aeromachus pygmaeus</i> Fabricius	Common
114	Dark palm dart	<i>Telicota ancilla</i> Herrich-Schäffer	Occasional
115	Pale palm dart	<i>Telicota colon</i> Fabricius	Common
116	Chestnut bob	<i>Lambrix salsala</i> Moore	Common
117	Restricted demon	<i>Notocrypta curvifascia</i> Felder	Occasional
118	Southern spotted ace	<i>Thoressa astigmata</i> Swinhoe	Rare
119	Giant red eye	<i>Gangara thyrasis</i> Fabricius	Common
120	Small Branded swift	<i>Pelopidas mathias</i> Fabricius	Occasional

121	Paintbrush swift	<i>Baoris farri Moore</i>	Rare
122	Straight swift	<i>Parnara naso Fabricius</i>	Occasional

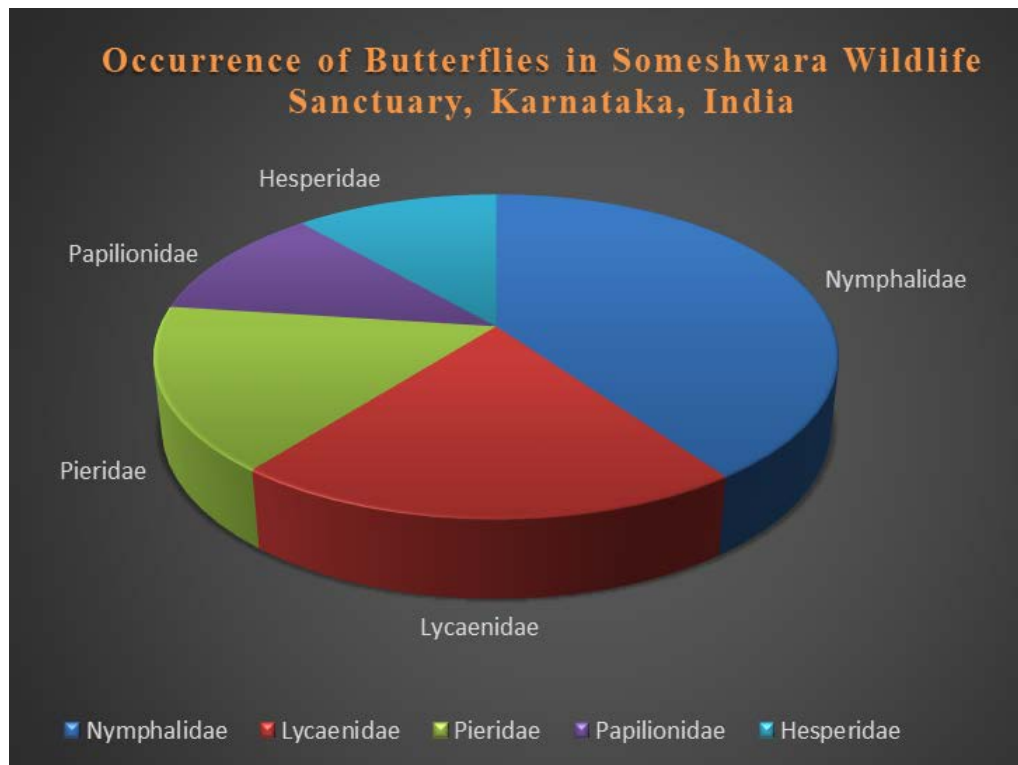


Fig 1: Occurrence of Butterflies in Someshwara Wildlife Sanctuary, Karnataka, India

Results and Discussion

The diverse habitats found in the Someshwara wildlife sanctuary offer favorable environmental conditions for several butterfly species. A total of 122 butterfly species belonging to 5 families were recorded during the study period. Nymphalidae was the richest family that comprised (49 and 40.16%) of the total species of butterfly recorded in the study area followed by Lycaenidae (25 and 20.49%), Pieridae, Papilionidae, and Hesperidae families were the lowest (20 and 16.39 %, 14 and 11.47 %, 14 and 11.47 %) each respectively.

The number of butterflies was observed maximum in post-monsoon than rainy and summer season as similar as Sunil, K. & Deepti, MS.N. (2016) [6]. However, the Nymphalidae was dominant in the study area among all reported species from Someshwara Wildlife Sanctuary of Karnataka during survey periods. The observed species represents the butterflies of Someshwara Wildlife Sanctuary of Karnataka and therefore represents the common butterfly species of Western Ghats.

References

1. Butterflies of India, v. 2.10 Indian Foundation for Butterflies K. Kunte, P. Roy, S. Kalesh, & U Kodandaramaiah
2. Kunte K. Butterflies of Peninsular India. Universities Press (Hyderabad) and Indian Academy of Sciences (Bangalore),2000,254.
3. Kunte K, Sondhi S, Samgma BM, Lovalekar R, Tokekar K, Agavekar G. Butterflies of the Garo Hills of Meghalaya northeastern India: Their diversity and conservation. Journal of the Threatened Taxa,2012;4(10):2933-2992.
4. Lafontaine JD. Butterflies and Moths. In: Smith, I.M. (ed.), Assessment of species diversity in the Mixed Wood Plains ecozone. Printed summary, Eman Publication, Karachi, Pakistan,1997,1-31.
5. Robbins RK, Opler PA. Butterfly diversity and a preliminary comparison with bird and mammal diversity. In: Biodiversity II. Understanding and Protecting our Biological Resources. (Eds: Reaka-Kudla, ML; Wilson, DE; Wilson, EO) National Academy of Sciences, Washington,DC,1997, 69-82.
6. Sunil K, Deepti M, Priyanka VL, Lily SN. Butterfly diversity of the Gangetic plain (Doaba) at Allahabad, U.P, India. Journal of Entomology Studies,2016;4(6):268-271.
7. Tiple AD, Deshmukh VP, Dennis RLH. Factors influencing nectar plant resource visits by butterflies on a university campus: implications for conservation. Nota Lepidopteralogica,2006;28:213-224.