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A Checklist of Butterflies of Meenachil River Basin, Kerala, India

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ABSTRACT:

Butterflies are highly sensitive to environmental change and are delicate creatures that act as good bio-indicators of the health of an ecosystem. Meenachil river basin has attracted considerable amount of public interest. A survey of the butterflies conducted randomly revealed a total of 91 species belonging to five families including three endemic species. Family Nymphalidae dominated in the study area, followed by Hesperiidae and Lycaenidae. This area is currently under severe anthropogenic pressure and minimizing these disturbances is important for the long-term survival of specialist butterflies.

Keywords:
Meenachil river, Endemic species, bio-indicators, anthropogenic pressure.

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INTRODUCTION

Butterflies are the most beautiful and colourful creatures on the earth and have a great aesthetic value. India harbours about 1501 species of butterflies (Haribal, 1992), 285 species are found in southern India (Thomas, 1966), of which 45 species are endemic to southern India. Butterflies, widely appreciated for the aesthetic value are important as ecological indicators (Chakravarthy *et al*., 1997) and 'flagship taxa" in biodiversity inventories (Lawton *et al*., 1998).

Meenachil river which is one of the important river of Kottayam district in Kerala, emerges from Western Ghats and confluences into Vembanad Lake. This river has a total length of 78 km and has a catchment area of 1272 km^2. The entire Meenachil watershed area geographically lies between 9°25' N to 9°55' N latitude and 76°30' E to 77°00' E longitude. The general elevation of the entire river basin ranges from 77 m to 1156 m in the high lands and less than 2 m in the low lands. The Meenachil river basin falls within the realm of tropical climate. The temperature of the area varies in between 24°C and 32°C throughout the year. The annual rainfall varies from less than 100 cm to more than 500 cm with an average of 300 cm. The occasional rainfall is also received between the two seasons. Rubber trees are extensively cultivated in vast areas in the entire river basin. Besides rubber, other crops like spices, paddies etc., are also cultivated in the river basin area (Watershed Atlas, 1996).

Among insects, butterflies are the most studied group. Larsen (1987a, b, c, 1988) made a detailed survey of butterflies of Nilgiri Mountains and recorded nearly 300 species including endemics. In Kerala, documentation of butterflies on Silent Valley National Park (Mathew and Rahamathulla, 1993) and Parambikulam Wildlife Sanctuary (Sudeendrakumar *et al*., 2000) have been carried out. The present paper presents a checklist and diversity of butterfly populations in different altitude levels in Meenachil river basin in Kerala, South India. However, comprehensive long-term ecological studies to monitor the butterfly population of the area remains as a serious lacuna. Such studies are imperative to improve the ecological utility of butterflies as indicator taxa.

MATERIALS AND METHODS

The present study is an attempt to provide a checklist of butterflies based on a four-year field study from October 2008 to October 2012. Identification of species was done using available literature (Evans, 1932; Gunathilagaraj *et al*., 1998; Haribal, 1992; Palot *et al*., 2003; Gay *et al.,* 1992; Wynter-Blyth, 1957) and with the help of experts. Species classification and scientific names are as per Gunathilagaraj *et al*., (1998).

RESULT AND DISCUSSION

The study during the period indicate that the habitats where butterflies were found and captured are disturbed areas and are strongly influenced by anthropogenic activities. These range from city lots to pasture, abandoned fields, road sides, plantations, riparian area, etc.

A total of 91 species belonging to 71 genera distributed over five families were collected from the monitoring sites, during the study period. The family Nymphalidae dominated with 34 species followed by Hesperiidae (20 spp.), Lycaenidae (18 spp.), Pieridae (7 spp.), and Papilionidae (12 spp.). Even though, the family Nymphalidae exhibited the maximum species diversity, family Pieridae showed maximum species density. Three butterfly species recorded from this region have protected status under the Wildlife Protection Act, 1972 (Arora, 2003). They are *Hypolimnas misippus* and *Atrophaneura hector* included under Schedule I Part IV and one species *Aeromachus pygmaeus* in Schedule II Part II. Further research with reference to ecology, threats and conservation of butterflies in the area is in progress.

Table 1. List of butterfly species collected in the study areas and the plants visited by them

Sl. No.	Common Name	Scientific Name	Wingspan	Status	Plants visited
FAMILY PAPILIONIDAE					
1	Common Blue Bottle	*Graphium sarpedon* (Linnaeus)	80-90 mm	Common	*Litsea chinensis, Polyalthia longifolia, Cinnamomum malabatrum, Persea odoratissima, P. macrantha*
2	Tailed Jay	*Graphium agamemnon* (Linnaeus)	85-100 mm	Common	*Polyalthia longifolia, Cinnamomum spp., Annona reticulata, A. squamosa*
3	Common Mime	*Papilio clytia* (Linnaeus)	90-100 mm	Common	*Litsea chinensis*
4	Common Mormon	*Papilio polytes* (Linnaeus)	90-100 mm	Very Common	*Citrus spp., Glycosmis arborea, Murraya koenigii,* curry leaf plant
5	Blue Mormon	*Papilio polymnestor* (Cramer)	120-150 mm	Not rare	*Citrus limona, Glycosmis arborea*
6	Lime Butterfly	*Papilio demoleus* (Linnaeus)	80-100 mm	Very Common	*Glycosmis arborea, Murraya koenigii*
7	Paris Peacock	*Papilio paris* (Linnaeus)			*Citrus* spp.
8	Common Rose	*Atrophaneura aristolochiae* (Fabricius)	80-110 mm	Common	*Thottea siliquosa*
9	Malabar Rose	*Atrophaneura pandiyana* (Moore)	100-130 mm	Common	*Thottea siliquosa*
10	Crimson Rose*	*Atrophaneura hector* (Linnaeus)	90-110 mm	Common	*Aristolochia indica, Thottea siliquosa*
11	Common Birdwing	*Troides helena* (Linnaeus)	140-170 mm	Not rare	
12	Southern Birdwing	*Troides minos* (Cramer)	140-190 mm	Not rare	*Aristolochia indica, Thottea siliquosa*
FAMILY PIERIDAE					
13	Common Grass Yellow	*Eurema hecabe* (Linnaeus)	40-50 mm	Common	*Caesalpinia spp., Cassia tora, C. fistula, Acacia spp.*
14	Common Emigrant	*Catopsilia pomona* (Fabricius)	55-80 mm	Common	*Bauhinia racemosa, C. fistula, C. tora, Butea monosperma*
15	Mottled Emigrant	*Catopsilia pyranthe* (Linnaeus)	50-70 mm	Common	*C. fistula, C. tora*
16	Great Orange Tip	*Hebomoia glaucippe* (Linnaeus)	80-100 mm	Common	*Capparis* spp.
17	Chocolate Albatross	*Appias lyncida* (Cramer)	55-70 mm	Common	*Capparis* spp.
18	Common Jezebel	*Delias eucharis* (Drury)	66-83 mm	Common	*Dendrophthoe falcata*
19	Psyche	*Leptosia nina* (Fabricius)	35-50 mm	Common	*Cleome viscosa*
FAMILY NYMPHALIDAE					
20	Blue Tiger	*Tirumala limniace* (Cramer)	90-100 mm	Common	*Lantana camara, Ageratum conyzoides, Crotalaria retusa*
21	Dark Blue Tiger	*Tirumala septentrionis* (Butler)	75-95 mm	Common	*Ageratum conyzoides*
22	Stripped Tiger	*Danaus genutia* (Cramer)	72-100 mm	Common	*Tridax procumbens, Lantana* spp., *Crotalaria retusa*
23	Plain Tiger	*Danaus chrysippus* (Linnaeus)	70-80 mm	Common	*Calotropis* spp., *Ageratum conyzoides, Tridax procumbens,Crotalaria retusa,*
24	Glassy Blue Tiger	*Parantica aglea* (Stoll)	70-85 mm	Common	*Calotropis* spp., *Ageratum conyzoides, Stachytarpheta* spp., *Crotalaria retusa*

25	Common Crow	*Euploea core* (Cramer)	85-95 mm	Common	*Ichnocarpus frutescens, Hemidesmus indicus, Ficus spp., Streblus asper, Ageratum conyzoides, Crotalaria spp., Chromolaena odorata*
26	Common Nawab	*Polyura athamas* (Drury)	60-75 mm	Common	*Acacia pennata, Adenanthera pavonina*
27	Common Evening Brown	*Melanitis leda* (Linnaeus)	60-80 mm	Common	*Oryza sativa, Panicum* spp.
28	Bamboo Treebrown	*Lethe europa* (Fabricius)	65-75 mm	Common	*Bambusa* spp.
29	Common Palmfly	*Elymnias hypermnestra* (Linnaeus)	60-80 mm	Common	*Areca catechu, Cocos nucifera*
30	Common Bushbrown	*Mycalesis perseus* (Fabricius)	38-55 mm	Common	*Oryza spp.*
31	smooth-eyed bushbrown	*Orsotriaena medus* (Fabricius)	45-55 mm	Common	*Oryza sativa*
32	Common Fivering	*Ypthima baldus* (Fabricius)	32-48 mm	Common	
33	Common Fourring	*Ypthima huebneri* (Kirby)	30-40 mm	Common	*Grasses*
34	Tawny Coster	*Acraea violae* (Fabricius)	50-65 mm	Common	*Aporosa lindleyana, Passiflora foetida*
35	Tamil Yeoman	*Cirrochroa thais* (Fabricius)	60-75 mm	Common	*Hydnocarpus spp.*
36	Rustic	*Cupha erymanthis* (Drury)	50-60 mm	Common	
37	Common Leopard	*Phalanta phalantha* (Drury)	50-60 mm	Common	
38	Commander	*Moduza procris* (Cramer)	60-75 mm	Common	*Ochreinauclea missionis, Mussaenda frondosa*
39	Common Lascar	*Pantoporia hordonia* (Stoll)	45-50 mm	Common	*Acacia pennata*
40	Common Sailor	*Neptis hylas* (Linnaeus)	50-60 mm	Common	*Dalbergia* spp., *Zizyphus* spp., *Thespesia populnea, Grewia spp., Bombax alabaricum*
41	Clipper	*Parthenos sylvia* (Cramer)	95-130 mm	Common	*tinospora cordifolia*
42	Common Baron	*Euthalia aconthea* (Hewitson)	55-80 mm	Common	*Anacardium occidentalis, Mangifera indica, Streblus asper*
43	Grey Count	*Tanaecia lepidea* (Butler)	65-85 mm	Common	*Careya arborea*
44	Common Map	*Cyrestis thyodamas* (Boisduval)	50-60 mm	Not Common	*Ficus spp.*
45	Painted Lady	*Vanessa cardui* (Linnaeus)	55-70 mm	Common	*Blumea spp.*
46	Angled Caster	*Ariadne ariadne* (Linnaeus)	45-60mm	Uncommon	*Ricinus communis*
47	Common Caster	*Ariadne merione* (Cramer)	45-60mm	Common	*Ricinus communis*
48	Chocolate Pansy	*Junonia iphita* (Cramer)	55-80 mm	Common	
49	Grey Pansy	*Junonia atlites* (Linnaeus)	55-65 mm	Common	
50	Peacock Pansy	*Junonia almana* (Linnaeus)	60-65 mm	Common	*Osbeckia spp.*
51	Lemon Pansy	*Junonia lemonias* (Linnaeus)	40-60 mm	Common	*Sida rhombifolia*
52	Great Eggfly	*Hypolimnas bolina* (Linnaeus)	70-110 mm	Common	*Sida rhombifolia, Hibiscus spp.*
53	Danaid Eggfly*	*Hypolimnas misippus* (Linnaeus)	70-85 mm	Common	*Hibiscus spp.*
FAMILY LYCAENIDAE					
54	Ape Fly	*Spalgis epius* (Westwood)	20-30 mm	Not common	*Carnivorous caterpillars feed on mealy bugs*
55	Indian Sunbeam	*Curetis thetis* (Hübner)	40-48 mm	Not rare	*Abrus precatorius, Pongamia pinnata*
56	Red Spot	*Zesius chrysomallus* (Hübner)	38-44 mm	Not rare	*Caterpillars feed on ant larvae*
57	Yamfly	*Loxura atymnus* (Cramer)	36-40 mm	Common	*Smilax spp., Dioscorea pentaphylla*
58	Monkey Puzzle	*Rathinda amor* (Fabricius)	26-28 mm	Not rare	*Ixora* spp.

59	Slate Flash	*Rapala manea* (Hewitson)	30-33 mm	Common	*Acacia pennata*
60	Common Silverline	*Cigaritis vulcanus* (Fabricius)	26-34 mm	Common	*Zizyphus rugosa, Canthium oromandelicum, Clerodendrum inerme*
61	Angled Pierrot	*Caleta caleta* (Hewitson)	26-32 mm	Not rare	*Zizyphus rugosa*
62	Banded Blue Pierrot	*Discolampa ethion* (Cramer)	26-30 mm	Common	*Ziziphus spp.*
63	Common Pierrot	*Castalius rosimon* (Fabricius)	24-34 mm	Common	*Zizyphus rugosa, Z. jujuba*
64	Common Line Blue	*Prosotas nora* (C. Felder)	18-25 mm	Common	*Acacia catechu, Mimosa spp.*
65	Dark Cerulean	*Jamides bochus* (Stoll)	25-34 mm	Common	*Butea monosperma, Crotalaria spp., Pongamia pinnata*
66	Common Cerulean	*Jamides celeno* (Cramer)	27-40 mm	Common	*Butea monosperma, Pongamia pinnata, Abrus precatorius*
67	Forget me not	*Catochrysops strabo* (Fabricius)	25-35 mm	Common	*Desmodium* spp.
68	Lesser Grass Blue	*Zizina otis* (Fabricius)	19-26 mm	Common	*Fabaceae* spp.
69	Red Pierrot	*Talicada nyseus* (Guérin)	30-36 mm	Common	
70	Quaker	*Neopithecops zalmora* (Butler)	16-30 mm	Common	*Glycosmis pentaphylla*
71	Plum Judy	*Abisara echerius* (Stoll)	40-50 mm	Common	
FAMILY HESPERIIDAE					
72	Common Spotted Flat	*Celaenorrhinus leucocera* (Kollar)	45-55 mm	Common	
73	Indian Skipper	*Spialia galba* (Fabricius)	20-27 mm	Common	*Sida rhombifolia, Hibiscus spp.*
74	Common Small Flat	*Sarangesa dasahara* (Moore)	26-35 mm	Common	*Asystasia* spp.
75	Tricolour Pied Flat	*Coladenia indrani* (Moore)	40-46 mm	Common	*Mallotus philippinensis, Desmodium spp.*
76	Suffused Snow Flat	*Tagiades gana* (Moore)	45-50 mm	Not rare	
77	Water Snow Flat	*Tagiades litigiosa* (Möschler)	37-44 mm	Not rare	*Smilax* spp.
78	Tamil Grass Dart	*Taractrocera ceramas*	23-30 mm	Common	*Oryza sativa, grasses*
79	Common Grass Dart	*Taractrocera maevius* (Fabricius)	22-28 mm	Common	*Grasses*
80	Common Dartlet	*Oriens goloides* (Moore)	24-28 mm	Common	
81	Dark Palm Dart	*Telicota ancilla* (Herrrich-Schäffer)	33-36 mm	Common	*Cocos nucifera, Oryza spp., Saccharum spp.*
82	Rice Swift	*Borbo cinnara* (Wallace)	30-36 mm	Common	*Oryza sativa, Pennisetum* spp., *Ischaemum* spp., *Cymbopogon* spp.
83	Contigous Swift	*Polytremis lubricans* (Herrrich-Schäffer)	36-42 mm	Not common	
84	Indian Palm Bob	*Suastus gremius* (Fabricius)	32-45 mm	Common	*Calamus* spp., *Caryota urens, Cocos nucifera*
85	Gaint Red eye	*Gangara thyrsis* Fabricius)	70-76 mm	Not rare	*Calamus rotang, Caryota urens, Cocos nucifera*
86	Common Redeye	*Matapa aria* (Moore)	40-55 mm	Common	
87	Chestnut Bob	*Iambrix salsala* (Moore)	26-30 mm	Common	*Grasses and bamboos*
88	Restricted Demon	*Notocrypta curvifascia* (Felder & Felder)	38-50 mm	Common	*Costus speciosus*
89	Grass Demon	*Udaspus folus* (Cramer)	40-48 mm	Common	*Zingiber* spp.
90	Pygmy Scrub Hopper**	*Aeromachus pygmaeus* (Fabricius)	20-22 mm	Common	
91	Indian Ace	*Halpe homolea* (Hewitson)	30-36 mm	Common	*Bamboo*

*** - indicates species coming under Schedule I Part IV and ** - Schedule II Part II of The Wildlife (Protection) Act, 1972**

The study shows that the sustained interference and disturbance seem to affect the occurrence and numerical strength of each butterfly species. If this situation goes unabated, the abundant butterflies may become rare and the less abundant ones could disappear permanently. Further, the decline in the number of butterflies largely allows inbreeding which becomes fatal in course of time. Modified habitats with reduced plant cover contribute to warm conditions and these conditions might allow some butterflies to extend their distribution to different habitats. The butterflies which control certain plant pets, if decline in number or disappear from the habitat, plants too get affected because of the unchecked plant pets. Therefore, the very presence of butterflies in species and number may be taken as an indication of the health of the habitat.

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