



BUTTERFLIES NECTAR FOOD PLANTS FROM GLENMORGAN, THE NILGIRIS, TAMIL NADU, INDIA

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ABSTRACT: Butterflies are important components of biodiversity and play an important role in the food chain of a forest ecosystem. An attempt was being made to enumerate the butterfly nectar food plants in Glenmorgan, Nilgiris District, Tamil Nadu. The present study has been aimed to explore the floral attributes of nectar feeding butterflies in relation to relative abundance. A total of 65 species of butterflies belonging to 5 families were recorded as flower visitor and nectar feeding on 84 species of plants belong to 69 genera and 30 families. The highest number of butterflies belonging to the family Nymphalidae 26 species, Pieridae 14 species, Lycaenidae 13 species, Hesperidae and Papilionidae with 6 species. Plant visitors of different butterfly species varied considerably; while some were highly seasonal, others had staggered for flowering and vegetative habitats.

Keywords: Butterfly, nectar food plants, abundance, Glenmorgan, The Nilgiris

INTRODUCTION

The Nilgiris is situated in the Western Ghats of India, one of the eight hottest hot spots of the world is known for its rich biodiversity. Interaction of living organisms with environment has led to an increase in biodiversity [1]. Butterflies are one of the most plant dependent group in insects [2]. About 300 species of butterflies are found in the Nilgiris [3]. Butterflies are important natural resources as they help in pollination, natural propagation and they feed on specific host plant foliage, nectar and pollen as their food. There is an association between butterflies and plants and their lives [4]. Flowering plants of 2,100 species are endemic to peninsular India, among this 818 are found in the Nilgiris and adjoining areas. The relationship between butterflies and plants is very specific and attracted by flower colours like red, yellow and blue, having diurnal anthesis. Thus butterflies reflect overall plant diversity, mainly herbs and shrubs. Butterflies are good indicators of environmental changes in the ambient features of any ecosystem. Seasonal variation probably reflects the phenophases of their host plant [5]. Hence the present investigation has been carried out to explore the nectar food plants and relative abundance of butterflies in Glenmorgan, the Nilgiris, Tamil Nadu.

MATERIALS AND METHODS

Study area: The study on butterfly nectar plants was carried out in Glenmorgan, the Nilgiris, is situated between 11°29'N and 76°32'E. It has an elevation of about 2057msl. The study was extensively carried out from July 2013 to March 2015. Observations were made between 08:00h to 15:00h. Butterfly species were identified directly by sighting with the help of standard identification keys and field guides. Collection was restricted and photographic documentation has done. All scientific names followed by Varshney, 1993 and Kunte, 2000 [6, 7]. Common names after Wynter-Blyth, 1957 [8]. Plant materials were collected and identified with the floras, taxonomic revisions and monographs by using identification keys [9, 10]. Habit and associated species distribution pattern were also noted.

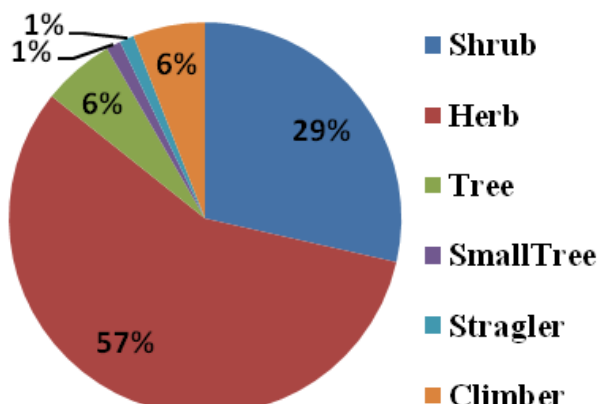


Figure-2: Plant life forms in study

Table 1. List of butterfly species in the study area and plant visited for nectar

S.No	Common name	Scientific name	Plant visited / nectar food
Family: Papilionidae			
1	Common Mormon	<i>Papilio polytes</i> Linnaeus	<i>Lantana camara, Salvia leucantha, Cestrum aurantiacum, Solanum maurantiacum, Dahlia imperialis, Ageratina adenophora, Abutilon hirtum, Hypericum mysuruse, Crassocephalum crepidioides, Rhododendron arborea, Acacia mearnsii etc.,</i>
2	Blue Mormon	<i>Papilio polymnestor</i> Cramer	
3	Lime Butterfly	<i>Papilio demoleus</i> Linnaeus	
4	Crimson Rose	<i>Pachliopta hector</i> Linnaeus	
5	Common Rose	<i>Pachliopta aristolochiae</i> Fabricius	
6	Common Bluebottle	<i>Graphium sarpedon</i> Linnaeus	
Family: Pieridae			
7	Common Albatross	<i>Appias albina</i> Moore	<i>Ageratina adenophora, Bidens pilosa, Lantana camara, Oplismenus undulatifolius, Galingsoga parviflora, Acmela calva, Oxalis latifolia, Sida rhombidea Salvia leucantha, Justicia japonica, Solanum nigrum, Plectranthus barbatus, Trifolium repens, Cystissus scoparius, Sida acuta, Ophiopogon intermediates, Verbascum thapsus Helichrysum bracteatum etc.,</i>
8	Pioneer	<i>Belenois aurota</i> Fabricius	
9	Common Gull	<i>Cepora nerissa</i> Fabricius	
10	Common Jezebel	<i>Delias eucharis</i> Drury	
11	Mottled Emigrant	<i>Catopsilia pyranthe</i> Linnaeus	
12	Common Wanderer	<i>Pareronia valeria</i> Cramer	
13	Common Emigrant	<i>Catopsilia pomona</i> Fabricius	
14	Common Grass Yellow	<i>Eurema hecabe</i> Linnaeus	
15	Three-spot Grass Yellow	<i>Eurema blanda</i> Boisduval	
16	White Orange Tip	<i>Ixias marianne</i> Cramer	
17	Yellow orange tip	<i>Ixias pyrene</i> Linnaeus	
18	Small Orange Tip	<i>Colotis etrida</i> Boisduval	
19	Crimson Tip	<i>Colotis danae</i> Fabricius	
20	Indian Cabbage White	<i>Pieris canidia</i> Linnaeus	
Family: Lycaenidae			
21	Common Pierrot	<i>Castalius rosimon</i> Fabricius	<i>Oenothera rosea, Cynotis villosa, Erigeron karvinskianus, Prinsipia utilis, Oxalis latifolia, Jasminum mesnyi, Oplismenus undulatifolius Bidens pilosa, Galinsoga parviflora, Taraxacum javanicum, Trifolium repens, Parthenium hysterophorus, Emilia sonchifolia, Gentiana quardifaria, Anaphalis bournei, Desmodium repandum, Poa annua, Ruta chaplensis etc.,</i>
22	Red Pierrot	<i>Talicerca nyseus</i> Guerin-Meneville	
23	Lime Blue	<i>Chilades lajus</i> Stoll	
24	Pale Grass Blue	<i>Pseudozizeeria maha</i> Kollar	
25	Indian Cupid	<i>Everes lacturnus</i> Godart	
26	Pointed Ciliate Blue	<i>Anthene lycaenina</i> Felder	
27	Dark Grass Blue	<i>Zizeeria karsandra</i> Moore	
28	Nilgiri Tit	<i>Chliaria nilgirica</i> Moore	
29	Common Acacia Blue	<i>Surendra quercetorum</i> Moore	
30	Plain Hedge Blue	<i>Celastrina lavendularis</i> Moore	
31	White Hedge Blue	<i>Udara akasa</i> Horsfield	
32	Grass Jewel	<i>Freyeria trochylus</i> Freyer	
33	Zebra Blue	<i>Leptotes plinius</i> Fabricius	

Family: Nymphalidae		
34	Plain Tiger	<i>Danaus chrysippus</i> Linnaeus
35	Striped Tiger	<i>Danaus genutia</i> Cramer
36	Common Four Ring	<i>Ypthima huebneri</i> Kirby
37	White Four Ring	<i>Ypthima ceylonica</i> Hewitson
38	Angled Castor	<i>Ariadne ariadne</i> Linnaeus
39	Common Castor	<i>Ariadne merione</i> Cramer
40	Common Bushbrown	<i>Mycalesis perseus</i> Fabricius
41	Dark-branded Bushbrown	<i>Mycalesis mineus</i> Linnaeus
42	Common Indian crow	<i>Euploea core</i> Carmer
43	Common Lascar	<i>Pantoporia hordonia</i> Stoll
44	Common Evening Brown	<i>Melanitis leda</i> Linnaeus
45	Nilgiri Fritillary	<i>Argynnis hybrida</i> Erans
46	Common Leopard	<i>Phalanta phalantha</i> Drury
47	Lemon Pansy	<i>Junonia lemonias</i> Linnaeus
48	Blue Pansy	<i>Junonia orithya</i> Linnaeus
49	Yellow Pansy	<i>Junonia hierta</i> Fabricius
50	Chocolate Pansy	<i>Junonia iphita</i> Cramer
51	Blue Tiger	<i>Tirumala limniace</i> Cramer
52	Dark Blue Tiger	<i>Tirumala septentrionis</i> Butler
53	Great Eggfly	<i>Hypolimnas bolina</i> Linnaeus
54	Danaid Eggfly	<i>Hypolimnas misippus</i> Linnaeus
55	Nilgiri Tiger	<i>Parantica nilgiriensis</i> Moore
56	Common Sailer	<i>Neptis hylas</i> Linnaeus
57	Tawny Coster	<i>Acraea violae</i> Fabricius
58	Cruiser	<i>Vindula erota</i> Fabricius
59	Painted Lady	<i>Vanessa cardui</i> Linnaeus
Family: Hesperidae		
60	Dark Palm Dart	<i>Telicota ancilla</i> Herrich-Schaffer
61	Water Snow Flat	<i>Tagiades litigiosa</i> Moschler
62	Orange Awlet	<i>Burara jaina</i> Moore
63	Indian Palm Bob	<i>Suastus gremius</i> Fabricius
64	White Banded Awl	<i>Hasora taminatus</i> Hubner
65	Indian Skipper	<i>Spialia galba</i> Fabricius

Taraxacum javanicum,
Bidens pilosa,
Lantana camara,
Leucas lamiifolia,
Cestrum aurantiacum,
Solanum mauritianum,
Crassocephalum cerpidioides,
Ageratina adenophora,
Cystissus scoparius, *Plectranthus barbatus*,
Helichrysum bracteatum, *Justicia japonica*,
Verbascum thapsus,
Verbena rigida, *Hypericum mysurse*,
Oplismenus undulatifolius,
Hypericum japonicum,
Sida acuta, *Trichilia connaroides*,
Nothapodytes nimmoniana,
Rhodomyrtus tomentosa,
Oenothera rosea,
Oxalis latifolia,
Parthenium hysterophorus,
Prinsepia utilis, *Rhamnus wightii*,
Gynura nitida,
Euphorbia rothiana, *Euphorbia milii*,
Vernonia conyzoides,
Youngia japonica,
Rothea serrata,
Rubus ellipticus etc.,

Abutilon striatum,
Galinsoga parviflora, *Trifolium repens*,
Lantana camara, *Taraxacum javanicum*,
Parthenium hysterophorus,
Poa annua etc.,

Table 2. Relative abundance of butterflies families from Glenmorgan, the Nilgiris

S.No	Family	Number of species	Relative Abundance (%)
1.	Papilionidae	6	9.23
2.	Pieridae	14	21.53
3.	Lycaenidae	13	20
4.	Nymphalidae	26	40
5.	Hesperidae	6	9.23
Total		65	100

The flora of the Nilgiris has shown a relationship with that of the Eastern Himalayas. In this region forests are evergreen composed of tropical and subtropical vegetation [12] has been found that the abundance of butterflies is highly related to the availability of food plants. Flower colour such as white and yellow served as dominant nectar visitors. George Mathew [13] has been reported about 1,500 species of butterflies has been reported from India, of which Peninsular India hosts 350, and the Western Ghats 330 species. Cyril and Sabarinathan [14] listed 85 butterfly species from Thengumarahada in the Nilgiris. Gunathilagaraj [15] reported 174 species of butterflies from Palani Hills.

Table. 3 Exploitation of plant families as nectar feeding plants in Glenmorgan, the Nilgiris.

S.No	Plant name	Family	Habit	Flower colour
1	<i>Abutilon hirtum</i> (Lam.) Sweet	Malvaceae	S	Orange
2	<i>Abutilon striatum</i> Dickson ex Lindl.	Malvaceae	S	Orange
3	<i>Acacia dealbata</i> Link, Enum.	Mimosiaceae	T	Yellow
4	<i>Acacia mearnsii</i> Wilde, Pl. Bequaert.	Mimosiaceae	T	Creamy
5	<i>Acmella calva</i> (DC.) R.K. Jansen	Asteraceae	H	Yellow
6	<i>Ageratina adenophora</i> (Spreng.) King & Robins.	Asteraceae	S	White
7	<i>Anaphalis bournei</i> Fyson	Asteraceae	H	White
8	<i>Bidens pilosa</i> L.	Asteraceae	H	White
9	<i>Biophytum intermedium</i> Wight	Oxalidaceae	H	Yellow
10	<i>Cestrum aurantiacum</i> Lindl.	Solanaceae	C	Orange
11	<i>Commelina maculata</i> Edgew.	Commelinaceae	H	Blue
12	<i>Conyza bonariensis</i> (L.) Cronquist	Asteraceae	H	Pale white
13	<i>Crassocephalum crepidioides</i> (Benth.) S. Moore	Asteraceae	H	Red
14	<i>Cyanotis villosa</i> (Spreng.) Schult. F.	Commelinaceae	H	Light pink
15	<i>Cynoglossum zeylanicum</i> (Vahl ex. Hornem.) Thunb. Ex Lehm.	Boraginaceae	H	Blue-Violet
16	<i>Cytisus scoparius</i> (L.) Link	Fabaceae	S	Yellow
17	<i>Dahlia imperialis</i> Roezl ex Ortgies	Asteraceae	S	Light pink
18	<i>Desmodium repandum</i> (Vahl) DC.	Fabaceae	H	Orange
19	<i>Emilia ramulosa</i> Gamble	Asteraceae	H	Pink
20	<i>Emilia sonchifolia</i> (L.) DC.	Asteraceae	H	Pink
21	<i>Erigeron karvinskianus</i> DC., Prodr.	Asteraceae	H	White, Pink
22	<i>Euphorbia milii</i> Desmoul, Bull.	Euphorbiaceae	S	Red
23	<i>Euphorbia pulcherrima</i> Willd. ex Klotzsch.	Euphorbiaceae	S	Red
24	<i>Euphorbia rothiana</i> Spreng.	Euphorbiaceae	S	Green
25	<i>Fagopyrum esculentum</i> Moench.	Polygonaceae	S	White
26	<i>Galinsoga parviflora</i> Cav.	Asteraceae	H	Yellow
27	<i>Gentiana quadrifaria</i> Blume	Gentianaceae	H	Violet
28	<i>Gynura nitida</i> DC.	Asteraceae	H	Orange
29	<i>Helichrysum bracteatum</i> (Vent.) T. Anders.	Asteraceae	H	Yellow
30	<i>Hypericum japonica</i> Thunb. ex Murr	Hypericaceae	H	Yellow
31	<i>Hypericum mysurense</i> Heyne ex Wight & Arn.	Hypericaceae	S	Yellow
32	<i>Indigofera cassioides</i> Rottl. Ex. DC.	Fabaceae	H	Dark pink
33	<i>Indigofera pedicellata</i> Wight & Arn.	Fabaceae	H	Red
34	<i>Isodon wightii</i> (Benth.) Hara	Lamiaceae	H	Pink-white
35	<i>Justicia japonica</i> Thunb.	Acanthaceae	H	Pink
36	<i>Lantana camara</i> L.	Verbenaceae	S	Yellow & Pink
37	<i>Leucas lamiifolia</i> Desf.	Lamiaceae	S	White
38	<i>Micromeria imbricata</i> (Forssk.) C.Chr.	Lamiaceae	H	Light pink

39	<i>Neanotis indica</i> (DC.) Lewis	Rubiaceae	H	Pink
40	<i>Nothapodytes nimmoniana</i> (J.Graham) Mabb.	Icacinaceae	ST	Pale white
41	<i>Oenothera rosea</i> Ait.	Onagraceae	H	Pinkish
42	<i>Ophiopogon intermedius</i> D. Don	Heamodoraceae	H	Dark Green
43	<i>Oplismenus undulatifolius</i> (Ard.) P.Beauv. ex Roem. & Schult.	Poaceae	H	Red (Spike)
44	<i>Oxalis corniculata</i> L.	Oxalidaceae	H	Yellow
45	<i>Oxalis latifolia</i> HBK, Nov.	Oxalidaceae	H	Pink
46	<i>Parachetus communis</i> Buch.-Ham. ex Chior.	Fabaceae	H	Blue
47	<i>Parthenium hysterophorus</i> L.	Asteraceae	H	White
48	<i>Passiflora mollissima</i> (H.B.K.) L. H. Bailey	Passifloraceae	C	Pink
49	<i>Persicaria chinensis</i> (L.) Gross. in Engl.	Polygonaceae	S	White-cream
50	<i>Phytolacca octandra</i> L.	Phytolaccaeae	H	White
51	<i>Picris hieracioides</i> L.	Asteraceae	H	Yellow
52	<i>Plectranthus barbatus</i> Andr.	Lamiaceae	H	Light blue
53	<i>Plectranthus glabratus</i> (Benth.) Alston in Trim.	Lamiaceae	S	Violet
54	<i>Poa annua</i> L.	Poaceae	H	Green
55	<i>Potentilla leschenaultiana</i> Ser. in DC.	Rosaceae	H	Yellow
56	<i>Prinsepia utilis</i> Royle	Rosaceae	S	White
57	<i>Rhamnus wightii</i> Wight & Arn.	Rhamnaceae	S	Light green
58	<i>Rhododendron arboreum</i> J. E. Smith ssp. <i>nilagiricum</i> (Zenk.)	Ericaceae	T	Red
59	<i>Rhodomyrtus tomentosa</i> (Sol. ex Ait.) Hassk.	Myrtaceae	S	Pinkish
60	<i>Rosa leschenaultiana</i> Red. & Thory ex Wight & Arn.	Rosaceae	C	Whitish
61	<i>Rotheca serrata</i> (L.) Steane & Mabb.	Lamiaceae	S	Blue-Violet
62	<i>Rubus ellipticus</i> Sm.	Rosaceae	St.	White
63	<i>Ruta chalepensis</i> L.	Rutaceae	H	Yellowish
64	<i>Salvia leucantha</i> Cav.	Lamiaceae	S	Violet-white
65	<i>Scutellaria barbata</i> D.Don	Lamiaceae	H	White-pink
66	<i>Senna didymobotyra</i> (Fresen.) Irwin & Barneby	Cesalpinoaceae	S	Yellow
67	<i>Sida acuta</i> Burm.	Malvaceae	S	Cream-Yellow
68	<i>Sida rhombidea</i> Roxb. ex Fleming	Malvaceae	S	Light yellow
69	<i>Solanum americanum</i> Mill.	Solanaceae	H	White
70	<i>Solanum jasminoides</i> Paxt.	Solanaceae	C	White
71	<i>Solanum mauritianum</i> Scop.	Solanaceae	S	Violet
72	<i>Solanum sisymbriifolium</i> Lam.	Solanaceae	S	White
73	<i>Syzygium densiflorum</i> Wall. ex Wight & Arn.	Myrtaceae	T	Green-White
74	<i>Taraxacum javanicum</i> Soest	Asteraceae	H	Yellow
75	<i>Toddalia asiatica</i> Baill.	Rutaceae	C	White-Pale green
76	<i>Trichilia connaroides</i> (Wight & Arn.) Benth.	Meliaceae	T	White
77	<i>Trifolium repens</i> L.	Fabaceae	H	White
78	<i>Verbascum thapsus</i> Trev.	Asteraceae	H	Green-yellow

79	<i>Verbena bonariensis</i> Rendle	Verbenaceae	H	Violet
80	<i>Verbena rigida</i> Spreng.	Verbenaceae	H	Violet
81	<i>Vernonia conyzoides</i> Chodat	Asteraceae	H	Pink-white
82	<i>Veronica polita</i> Fries	Scrophulariaceae	H	White-blue
83	<i>Wedelia chinensis</i> Merr.	Asteraceae	H	Yellow
84	<i>Youngia japonica</i> (L.) DC.	Asteraceae	H	Yellow-red

Note: **H**- Herb, **S**-Shrub, **T**-Tree

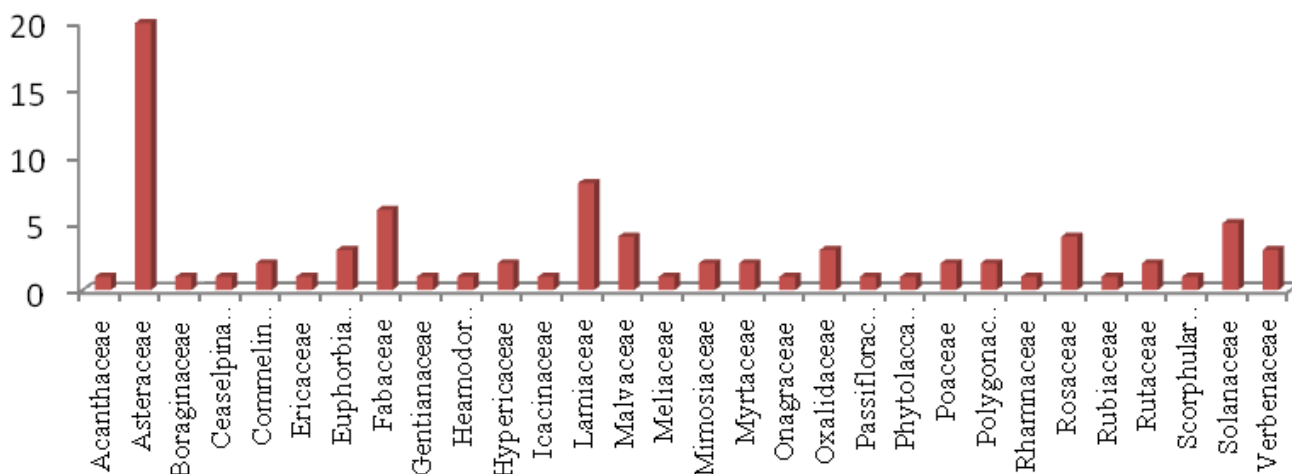


Figure-3: Dominant butterflies nectar food plant families in Glenmorgan, the Nilgiris

CONCLUSION

Butterfly fauna is rich in the Nilgiris. They are being used as indicators of environmental variation. The present study observed that butterflies dependent on plants for nectar. An attempt has been made to enumerate the butterfly nectar food plants revealed on the diversity and quite conscious on the importance of protection of their biological resource.

REFERENCES

- [1] George Mathew 2011. A Hand Book on The Butterflies Of Nilgiri Biosphere Reserve. Report No. 398. Kerala Forest Research Institute, Peechi, Thrissur, Kerala. India
- [2] Kristensen, N. P. and Skalski, A. W. 1999. Phylogeny and palaeontology. In: Kristensen N.P. (ed), Evolution, systematics and biogeography. Handbook of Zoology Lepidoptera: moths and butterflies.5: 7-25.
- [3] Larsen, T. B. 1987. The butterflies of the Nilgiri Mountain of southern India (Lepidoptera: Rhopalocera). J. Bombay Nat. Hist. Soc., 84(3): 560-584.
- [4] Feltwell, J. 1986. The Natural History of Butterflies. Groom Helem Ltd., Provident House, Bureel Row, Beckenham Kent BR3 IAT, 133p.
- [5] Kunte, K. 1997. Seasonal Patterns in butterfly abundance and species diversity in four tropical habitats in northern Western Ghats. Journal of Bioscience. 22: 593-603.
- [6] Varshney, R. K. 1993. Index Rhopalocera indica part II. Common names of Butterflies from India and neighbouring countries. Rec. Zool. Sur. India, 47: 1-49.
- [7] Kunte, K. 2000. Butterflies of Peninsular India. University Press, Hyderabad, India, 254p
- [8] Wynther-Blyth, M. A. 1957. Butterflies of the Indian Region. Bombay Natural Society.

- [9] Gamble, J. S. and Fischer, C. E. C. 1915-1936. *Flora of the Presidency of Madras*. Bishen Singh Mahendra Pal Sing. Dehra Dun.
- [10] Nair, N. C. and A. N. Henry, 1983. *Flora of Tamilnadu, India*. Ser. 1, Vol. 3. Botanical Survey of India. Coimbatore.
- [11] Nimbalkar, R.K., Chandekar S.K., and S.P. Khunte. 2011. Butterfly diversity in relation to nectar food plants from Bhor Tahsil, Pune District, Maharashtra, India. *Journal of Threatened Taxa* 3 (3): 1601-1609.
- [12] Gutierrez, D. & R. Mendez 1995. Phenology of Butterflies in the mountain area in northern Iberian Peninsular. *Ecography* 18: 209-2196.
- [13] George Mathew and C. F. Binoy 2002. Migration of Butterflies (Lepidoptera; Rhopalocera) in the New Amarambalam Reserve Forest of the Nilgiri Biosphere Reserve. *Zoos' print* 17(8): 844-847.
- [14] Cyril K. and S.P. Sabarinathan 2007. A Checklist of Butterflies of Thengumarahada in the Nilgiris, Southern India. *Zoo's print*, 22(9): 2837-2818.
- [15] Gunathilagaraj, K., Kumar, M.C., and P.T. Ramesh 1997. Butterflies of Coimbatore, *Zoo's print*, 12(1):26-27.

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