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Butterflies (Lepidoptera) of Thusharagiri, Kerala, India

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ABSTRACT: Survey conducted on butterflies of Thusharagiri, Kozhikode, Kerala State identified 59 species under 6 families; 29 species under Nymphalidae, nine species belongs to Papilionidae, seven each in Pieridae and Hesperiidae, six species belong to Lycaenidae, and one species in Riodinidae. The information regarding the diversity of butterflies forms a baseline data for future studies. © 2020 Association for Advancement of Entomology

KEYWORDS: Butterflies, Thusharagiri, Lepidoptera, Nymphalidae

The earliest known butterfly fossils are from mid Eocene epoch, in between 40-50 million years ago. Their development is closely linked to the evolution of flowering plants and which are probably evolved from moths. Butterflies are sensitive biota, which get severely affected by environmental variations and changes in forest structure (Pollard, 1991). They are the food chain of birds, reptiles, amphibians, spiders and predatory insects. They also respond to disturbances and changes in the quality of habitat, and are thus a good indicator species to evaluate changes in habitat and landscape structure variations (Kremen 1992; Kocher and Williams 2000). Butterflies and their caterpillars are dependent on specific host plants for food, thus the diversity of butterflies indirectly reflects overall plant diversity especially that of shrubs and herbs in the given area (Padhye *et al*., 2006). Most of them are strictly seasonal and prefer only particular set of habitats (Kunte 1997).

Butterflies are found throughout the world and are seen in large number (about 45,000 species) throughout tropical belt, which are categorized into 6 different families (Lamas, 2008), however they are not found in Antarctica. India has around 1,501 species of butterflies, out of which 334 species are reported from the Western Ghats and 37 species are endemic to the Western Ghats (Evans 1932; Kunte 2000). Of the 334 species of butterflies of Western Ghats, 316 species have been reported from Kerala (Palot *et al*., 2012).Very little documentation has been done on butterfly fauna in Kerala. Some of the earlier documentation on butterfly fauna from Kerala and adjacent areas include Mathew and Rahamathulla (1993), who had reported 100 species of butterflies from Silent Valley National Park, Sudheendrakumar *et al*. (2000), who reported 124 species of butterflies from Parambikulam Wildlife Sanctuary. Arun (2003), reported 75 species from Siruvani Reserved

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Forests; Ambrose and Raj (2005) reported 24 species from Kalakkad-Mundanthurai Tiger reserve; Eswaran and Pramod (2005) reported 75 species from Anaikatty near Coimbatore; Prasad *et al. (*2010) recorded 52 species from Kerala University campus, Thiruvananthapuram, while Toms *et al*. (2010) reported 109 species from Mahatma Gandhi University campus, Kottayam. Susanth and Rajasree (2012) studied butterflies in different habitats of Vazhachal- Athirapilly reserve forest. In 2014 Aneesh *et al.* reported 139 species of butterflies under six families from Kerala agricultural university campus, Trissur, Kerala, India. An attempt has been made to document diversity of butterflies in Thusharagiri, Kozhikode, Kerala and the findings are presented in this paper.

Study area Thusharagiri is located at 11.28 North, 76.3 East at an elevation of 15 m. It is located about 51 km away from Kozhikode town."Thusharagiri" means "snow-capped mountains". The major economy of the region comprises tourism and agriculture. It is a picturesque location, famous for its waterfalls. It comprises Erattumukku, MazhavilChattom and Thumbithullumpara. Of the three waterfalls, the highest one falls from an altitude ranges from 21.4°C to 33.5°C, and the average humidity of the region is about 52%. The butterfly fauna of Thusharagiri was surveyed from January 2020 to March 2020. The survey was conducted weekly from morning 10 AM to12.30 PM. The butterfly species were also photographed from different angles to enable positive identification of the species. Photographs were taken in Nikon D3500. Butterflies were primarily Species iidentified directly in the field with the help of field guides. Species identity was confirmed with the help of the field guides by Kunte (2000) and Kehimkar (2008), taxonomy and nomenclature have been updated after Kunte *et al*. (2011). The observed butterflies were categorized into 6 families. Butterflies observed were categorized into three groups based on their abundance during the period of study. Accordingly, those species observed 60–100 % of the survey days were categorized as common, 40–60 % as uncommon, 40–60 %, and below 40% as rare.

A total of 59 species belonging to six families were identified from Thusharagiri. Of these four species are endemic to Western Ghats and six species protected under various schedules of the Indian Wildlife (Protection) Act, 1972. Family Nymphalidae commonly called brush footed butterflies, 29 species belongs to this family, which is the largest family. Family Pieridae is commonly called whites and yellows, 7 species belongs to this family. 6 species belongs to the family Lycaenidae. They are known as blues. 7 species belongs to the family Hesperiidae, which is called skippers because of skipping and bounding flight exhibited by its members. Family Riodinidae is represented by one species, commonly called as judies and punches. 9 species belongs to the family papilionidae, usually called as swallow tails. The study showed that the family Nymphalidae is the most diverse butterfly family in Thusharagiri. The above observations are quite significant and it emphasizes the importance of Thusharagiri water fall area in the conservation of biological diversity.

Table 1. Number and percentage distribution of species under different Families

Sl.No	Family	Species Number	Percentage
1	Papilionidae	9	15.25
2	Pieridae	7	11.86
3	Nymphalidae	29	49.15
4	Lycaenidae	6	10.16
5	Hersperidae	7	11.86
6	Rionidae	1	1.69

CHECKLIST OF BUTTERFLIES OF THUSHARAGIRI

Habitat: Semi-evergreen and Riparian forest

Sl.No	Common Name	Scientific Name	Remarks
Family: Hesperiidae (Skippers)			
01.	Brown Awl	*Badamia exclamationis*	Common
02.	Suffused Snow Flat	*Tagiades gana*	Uncommon
03.	Bicolour Ace	*Sovia hyrtacus*	Rare, WG Endemic
04.	Chestnut Bob	*Iambrix salsala*	Common
05.	Coon	*Psolos fuligo*	Common
06.	Blank Swift	*Caltoris kumara*	Uncommon
07.	Indian Dartlet	*Oriens goloides*	Common
Family: Papilionidae (Swallowtails)			
08.	Southern Blue bottle	*Gaphium sarpedon*	Common
09.	Tailed Jay	*Graphium agamemnon*	Common
10.	Common Rose	*Pachliopta aristolochiae*	Common
11.	Malabar Rose	*Pachliopta pandiyana*	UncommonWG Endemic
12.	Crimson Rose	*Pachliopta hectar*	Common, **Schedule 1**
13.	Southern Birdwing	*Troides minos*	UncommonLargest butterfly in India
14.	Common Mormon	*Papilio polytes*	Common
15.	Red Helen	*Papilio helenus*	Common
16.	Blue Mormon	*Papilio polymnester*	Uncommon
Family: Pieridae (Whites and Yellows)			
17.	Three-spot Grass Yellow	*Eurema blanda*	Common
18.	Common Emigrant	*Catopsilia pomona*	Common
19.	Chocolate Albatross	*Appias lyncida*	Common, **Schedule 2**
20.	Common Albatross	*Appias albino*	Common.Migration observed (100 individuals per 1 minute
21.	Plain Puffin	*Appias indra*	Common
22.	Painted Saw tooth	*Prioneris sita*	Uncommon **,Schedule 4**
23.	Psyche	*Leptosia nina*	Common
Family: Riodinidae (Judies and Punches)			
24.	Plum Judy	*Abisara bifasciata*	Common
Family: Lycaenidae (Blues)			
25.	Pale Four-Line blue	*Nacaduba hermus*	Uncommon
26.	Common Cerulean	*Jamides celenobhairana*	Common

Sl.No	Common Name	Scientific Name	Remarks
27.	Metallic Cerulean	*Jamides alecto*	Common
28.	Common Pierrot	*Castalius rosimon*	Common
29.	Tiny Grass Blue	*Zisula hylax*	Common
30.	Common Hedge Blue	*Acytolepis puspa*	Common
Family: Nymphalidae (Brush-footed butterflies)			
31.	Blue Tiger	*Tirumala limniace*	Common
32.	Dark Blue Tiger	*Tirumala septentrionis*	Common
33.	Double-branded Crow	*Euploea sylvester*	Common
34.	Common Crow	*Euploea core*	Common
35.	Malabar Tree Nymph	*Idea malabarica*	UncommonWG Endemic
36.	Common Nawab	*Polyura athamas*	Common
37.	Common Evening Brown	*Melanitis leda*	Common
38.	Great Evening Brown	*Melanitis zitenius*	Uncommon
39.	Tamil Treebrown	*Lethe drypetis*	Common
40.	Common Five-ring	*Ypthima baldus*	Common
41.	Common Four-ring	*Ypthima huebneri*	Common
42.	Tawny Coster	*Acraea violae*	Common
43.	Small Leopard	*Phalanta alcippe*	Uncommon
44.	Cruiser	*Vindula erota*	Common
45.	Tamil Yeomen	*Cirrochro athais*	UncommonWG Endemic
46.	Rustic	*Cupha erymanthis*	Common
47.	Commander	*Moduza procris*	Common
48.	Common Sergeant	*Athyma perius*	Uncommon
49.	Colour Sergeant	*Athyma nefteinarva*	Uncommon
50.	Common Lascar	*Pantoporia hordonia*	Common
51.	Common Sailer	*Neptis hylas*	Common
52.	Sullied Sailer	*Neptis natahampsoni*	Rare
53.	Chestnut-streaked Sailer	*Neptis jumbah*	Common
54.	Clipper	*Parthenos sylviaviens*	Uncommon, **Schedule 2**
55.	Grey Count	*Cynitia lepidea*	Common, **Schedule 1**
56.	Common Map	*Cyrestis thyodamas*	Common
57.	Chocolate Pansy	*Junonia iphita*	Common
58.	Grey Pansy	*Junonia atlites*	Common
59.	Great Egg fly	*Hypolimnas bolina*	Common, **Schedule 1**

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