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Rhopalocera: Butterflies of Mahavir Harina Vanasthali National Park, Hyderabad, Telangana State

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ABSTRACT: The present study was carried out to understand the butterfly diversity in Mahavir Harina Vanasthali National Park, Hyderabad, Telangana from June 2017 to May 2019 in order to create a base line data for further research. Major forest type is Southern dry deciduous forest mixed with scrub jungle grasslands and plantations. In the present study a total of 69 species of butterflies in 46 genera from five families were recorded. Nymphalidae dominated the list with 28 species. Lycaenidaere presented with 16 species, Pieridae with 14 species, Papilionoidea with 7 and Hesperiidae with 4 species. It was found that three species of butterflies were listed under Schedule-I and four species listed under Schedule-II as per Indian Wildlife Protection Act 1972. This study will enlighten the information regarding the butterfly diversity and forms a baseline data for future butterfly studies could be conducted to obtain more details and documentation on butterfly diversity for the conservation.

Keywords: Butterflies, Mahavir Harina Vanasthali National Park, Hyderabad

INTRODUCTION

Butterflies are magnificent insects with attractive color patterns, hence, of great aesthetic value. They form an important part of the food chain of birds, reptiles, amphibians, spiders and predatory insects (Aneesh *et al.,* 2013). They are natural pollinators and have close relationship with the flowering plants and they are probably next only to birds in their universal popularity (Tewari and Rawat, 2013). Their existence in a habitat provides information regarding presence of other species of plants and animals. Butterflies they provide many vital economically important services within terrestrial ecosystems such as nutrients recycling, soil formation, food resources and pollination (Abdullahi *et al.,* 2019). Butterflies are generally regarded as one of the best taxonomically studied group of insects (Aishwarya *et al.,* 2014). Lepidoptera (Butterflies and moths) are the second largest order of arthropods and are most easily identified, making them particularly useful for biodiversity survey (Erhardt, 1985; Kremen, 1994; Inouye, 2001; Tiple and Arun, 2009). For many predators like birds, lizards these butterflies both in larva and adult stages act as their prey species. Diurnal butterflies are preferred indicators of habitat disturbance because of their sensitivity to environmental changes, diversity, advanced taxonomy, and lower economic and temporal costs of collection (Bonebrake *et al.,* 2010; Daily & Erlich, 1995; Leon-Cortes *et al.,* 2003; Bonebrake & Sorto, 2009).

Worldwide there are more than 28,000 species of butterflies, with about 80 percent found in tropical regions. The Indian subcontinent bearing a diverse terrain, climate and vegetation hosts about 1,504 species of butterflies (Tiple, 2011) which is about 8.74% of total butterfly species of world and constitutes of 65% of total Indian fauna. Different species of butterfly are supported by different ecosystems of our country (Sprih *et al.,* 2015). Appropriate abiotic and biotic factors such as climate condition, temperature and wind exposure, availability of host and larval plants, food and vegetation, topographic features, habitat quality are some of the most important parameters to determine butterfly composition in a community (Barlow *et al.,* 2007), (Ravindra *et al.,* 1996; Khan *et al.,* 2004; Jain & Jain, 2012; Kharat *et al.,* 2012; Kumaraswamy & Kunte, 2013), (Amala *et al.,* 2011), (Barlow *et al.,* 2007).

Climatic change affects the diversity of species and is expected to exacerbate the ecosystems (Scottand Lemieux, 2005). The changes in parameters of rainfall patterns, temperature, and extreme weather conditions such as prolonged drought or excessive rainfall, heat waves have to be taken into consideration. Shrinking of nectar and desiccation of host plants cause direct mortality and induce migratory behavior. Butterflies, being exothermal, are highly sensitive to climatic variation and a short generation time which makes them an appropriate model organism to study (Abdullahi *et al.,* 2019). Many butterfly species have showed population decline due to hunting, poaching and forest fires (Grewal, 1996). As a result, many butterfly species are facing threat in natural ecosystems including protected areas (Ghazol, 2002; Solomon and Rao, 2002). Hence, information on species composition, diversity, preferred host plants, food plants and distribution pattern of butterflies requires periodic

updating in protected areas (Basavarajappa *et al.*, 2018).

The present study was started to examine the diversity of butterflies from Mahavir Harina Vanasthali National Park, since there was no known published checklist of butterflies in the National Park.

MATERIAL AND METHODS

A. Study Area

Mahavir Harina Vanasthali National Park (17°36'0"N 78°47'0"E) is situated in the South East of Hyderabad city and spread over 1459 Ha. In the year 1994 it was declared as National Park, it is an isolated patch of natural forests (Fig. 1). It has rich bio-diversity of flora and fauna. Due to the rapid urbanization and expansion of the city, the National Park is fragmented in to four forest blocks (Main park and Extension I, Extension II, Extension III, Extension IV) and it is not a contiguous single forest area. Main park and Extension I the areas are demarcated as visitor zone and conservation zone respectively. For Extension II, III, IV the entire area is demarcated as conservation zones. The park is intersected by many roads passing through the forest blocks has divided the National Park. The park has rich biodiversity of flora and fauna and this park is home to vulnerable species Blackbuck (*Antelope cervicapra*). Major forest type is Southern dry deciduous forest mixed with scrub jungle and grasslands; the terrain varies from undulating hilly to gently rolling. Very few studies were carried out in documenting biodiversity of the park.

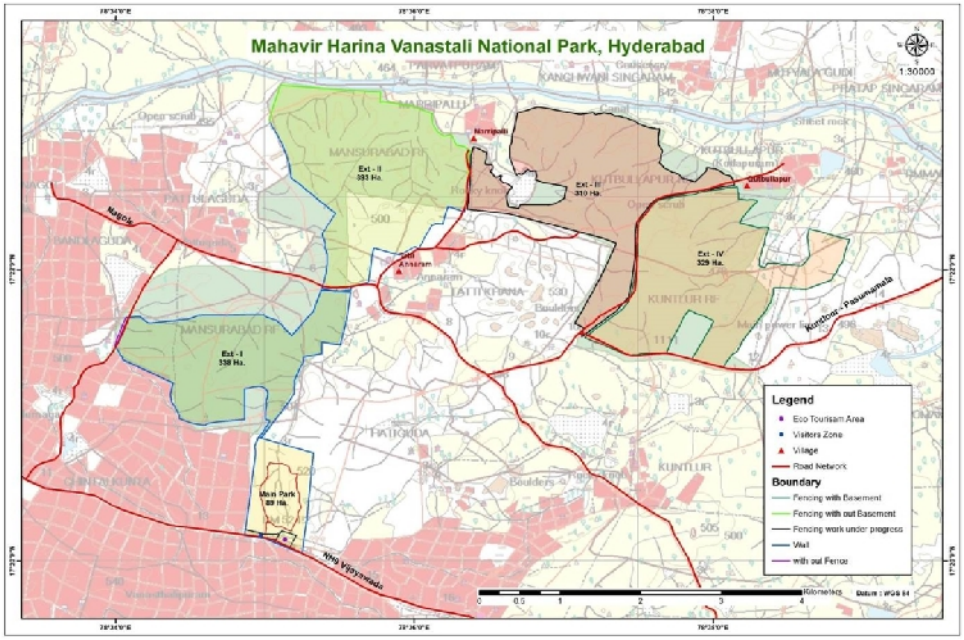


Fig. 1. Map of Mahavir Harina Vanasthali National Park.

B. Methodology

The findings presented here are based on a bi-weekly random survey carried out from June 2017 to May 2019 at the MHVNP. Butterflies were accessed in the study area from 9am to 11am in the morning by random observations during walking through the four extensions based on habitats present in the study area. In the field, photographs of the butterflies were taken with the aid of camera for the identification purpose based on (Dey *et al.*, 2017).

RESULTS AND DISCUSSION

A total of 69 species of butterflies representing five families and 46 genera have been recorded from the study (Table 1). Nymphalidae showed the maximum species richness, comprising of 28 species (41%), followed by Lycaenidae 16 species (23%), Pieridae 14 species (20%), Papilionidae 7 species, (10%) and Hesperiidae 4 species, (6%) (Fig. 2 & 3). Among these species, 11 (16%) species were rare, 15 (22%) species were Occasional, 23 (33%) species were Common and 20 (29%) species were Abundant (Fig. 4).

Among the butterflies, there are three species namely Danaid Eggfly (*Hypolimnas misippus*), Crimson Rose (*Pachliopta hector*) and Common Pierrot (*Castalius rosimon*) are listed under Schedule-I and four species Gram Blue (*Euchrysopscnejus*), Common Albatross (*Appias albino*), Common Gull (*Cepora nerissa*) and Black Rajah (*Charaxes solon*) are listed under Schedule-II as per Indian Wildlife Protection Act 1972.

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

S. No.	Family/Common Name	Scientific Name	Status
	Papilionidae (7)		
1	Common Bluebottle	*Graphium sarpedon* (Linnaeus, 1758)	R
2	Spot Swordtail	*Graphium nomius* (Esper, 1799)	O
3	Tailed Jay	*Graphium agamemnon* (Linnaeus, 1758)	R
4	Common Lime	*Papilio demoleus* (Linnaeus, 1758)	A
5	Common Mormon	*Papilio polytes* (Linnaeus, 1758)	A
6	Common Rose	*Pachliopta aristolochiae* (Fabricius, 1775)	C
7	Crimson Rose	*Pachliopta hector* (Linnaeus, 1758)	C
	Pieridae (14)		
8	Common Albatross	*Appias albina* (Boisduval, 1836)	R
9	Indian Pioneer	*Belenois aurota aurota* (Fabricius, 1793)	A
10	Common Emigrant	*Catopsilia pomona* (Fabricius, 1775)	A
11	Mottled Emigrant	*Catopsilia pyranthe* (Linnaeus, 1758)	O
12	Common Gull	*Cepora nerissa* (Fabricius, 1775)	A
13	Crimson-tip	*Colotis danae* (Fabricius, 1775)	C
14	Large Salmon Arab	*Colotis fausta* (Olivier, 1804)	C
15	Indian Jezebel	*Delias eucharis* (Drury, 1773)	O
16	Common Grass Yellow	*Euremahecabe* (Linnaeus, 1758)	A
17	Spotless Grass Yellow	*Euremalaeta* (Boisduval, 1836)	C
18	White Orange-tip	*Ixias marianne* (Cramer, [1779])	C
19	Yellow Orange-tip	*Ixias pyrene* (Linnaeus, 1764)	C
20	Psyche	*Leptosia nina* (Fabricius, 1793)	A
21	Indian Wanderer	*Pareronia hippia* (Fabricius, 1787)	A
	Nymphalidae (28)		
22	Tawny Coster	*Acraea terpsicore* (Linnaeus, 1758)	A
23	Angled Castor	*Ariadne ariadne*(Linnaeus, 1763)	C
24	Common Castor	*Ariadne merione* (Cramer, [1777])	C
25	Joker	*Byblia ilithyia* (Drury, [1773])	O
26	Anomalous Nawab	*Charaxes agrarius* (Swinhoe, [1887])	R
27	Common Nawab	*Charaxes athamas* (Drury, 1773)	O
28	Black Rajah	*Charaxes solon* (Fabricius, 1793)	R
29	Plain Tiger	*Danaus chrysippus* (Linnaeus, 1758)	A
30	Striped Tiger	*Danaus genutia* (Cramer, [1779])	A
31	Common Crow	*Euploea core* (Cramer, [1780])	A
32	Great Eggfly	*Hypolimnas bolina* (Linnaeus, 1758)	C
33	DanaidEggfly	*Hypolimnas misippus* (Linnaeus, 1764)	C
34	Peacock Pansy	*Junonia almana* (Linnaeus, 1758)	C
35	Grey Pansy	*Junonia atlites* (Linnaeus, 1763)	O
36	Yellow Pansy	*Junonia hierta* (Fabricius, 1798)	A
37	Chocolate Pansy	*Junonia iphita* (Cramer, 1779)	C
38	Lemon Pansy	*Junonia lemonias* (Linnaeus, 1758)	A
39	Blue Pansy	*Junonia orithya* (Linnaeus, 1758)	A
40	Common evening brown	*Melanitis leda* (Linnaeus, 1758)	C
41	Dark-branded Bushbrown	*Mycalesis mineus* (Linnaeus, 1758)	R
42	Common Sailer	*Neptis hylas* (Linnaeus, 1758)	R
43	Glassy Tiger	*Parantica aglea* (Stoll, [1782])	O
44	Common Leopard	*Phalanta phalantha* (Drury, [1773])	C
45	Baronet	*Symphae dranais* (Forster, 1771)	O
46	Blue Tiger	*Tirumala limniace* (Cramer, 1775)	C
47	Dark blue Tiger	*Tirumala septentrionis* (Butler, 1874)	R
48	Common Three-ring	*Ypthima asterope* (Klug, 1832)	O
49	Common Four-ring	*Ypthima huebneri* (Kirby, 1871)	R
	Lycaenidae (16)		
50	African babul blue	*Azanus jesous* (Guérin-Méneville, 1849)	C
51	Angled Pierrot	*Caleta decidia* (Hewitson, 1876)	R
52	Common Pierrot	*Castalius rosimon* (Fabricius, 1775)	A
53	Forget-me-not	*Catochrysops strabo* (Fabricius, 1793)	C
54	Lime Blue	*Chilades lajus* (Stoll, [1780])	A
55	Small Cupid	*Chilades parrhasius* (Fabricius, 1793)	C
56	Indian Sunbeam	*Curetis thetis* (Drury, [1773])	O
57	Gram Blue	*Euchrysops cnejus* (Fabricius, 1798)	A

Continued...

S. No.	Family/Common Name	Scientific Name	Status
	Lycaenidae (16)		
58	Dark Cerulean	*Jamides bochus* (Stoll, [1782])	O
59	Common Cerulean	*Jamides celeno* (Cramer, [1775])	C
60	Zebra Blue	*Leptotes plinius* (Fabricius, 1793)	O
61	Plains Cupid	*Luthrodes pandava* (Horsfield, [1829])	C
62	Monkey Puzzle	*Rathinda amor* (Fabricius, 1775)	R
63	Common Silverline	*Spindasis vulcanus* (Fabricius, 1775)	O
64	Red Pierrot	*Talicada nyseus* (Guérin-Méneville, 1843)	C
65	Tiny Grass Blue	*Zizula hylax* (Fabricius, 1775)	A
	Hesperiidae (4)		
66	Common Banded Awl	*Hasora chromus* (Cramer, 1780)	O
67	Indian Grizzled Skipper	*Spialia galba* (Fabricius, 1793)	A
68	Common grass dart	*Taractrocera maevius* (Fabricius, 1793)	C
69	Dark Palm-Dart	*Telicota bambusae* (Moore, 1878)	O

*A- Abundant; C- Common; O- Occasional; R- Rare

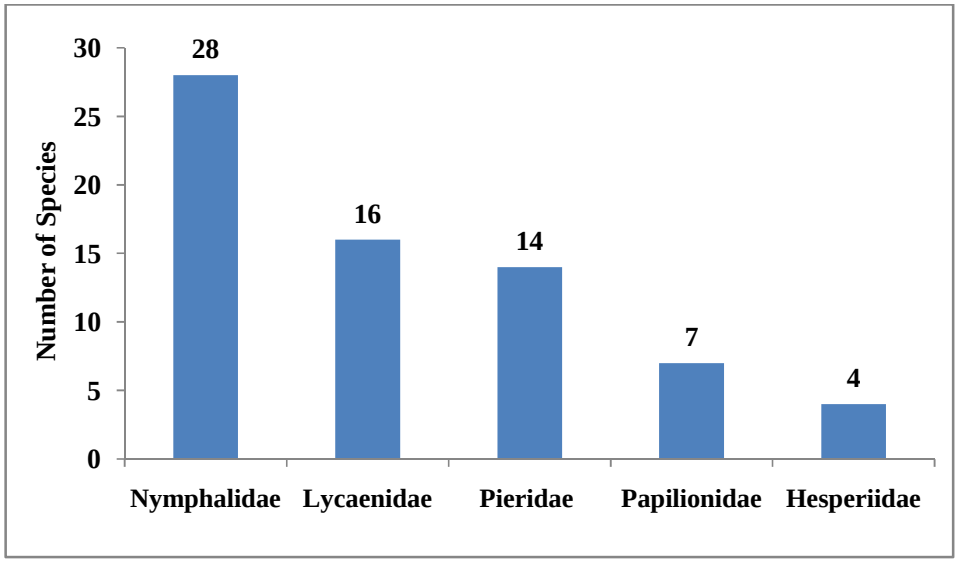


Fig. 2. Number of butterfly species in a family wise composition in the study area.

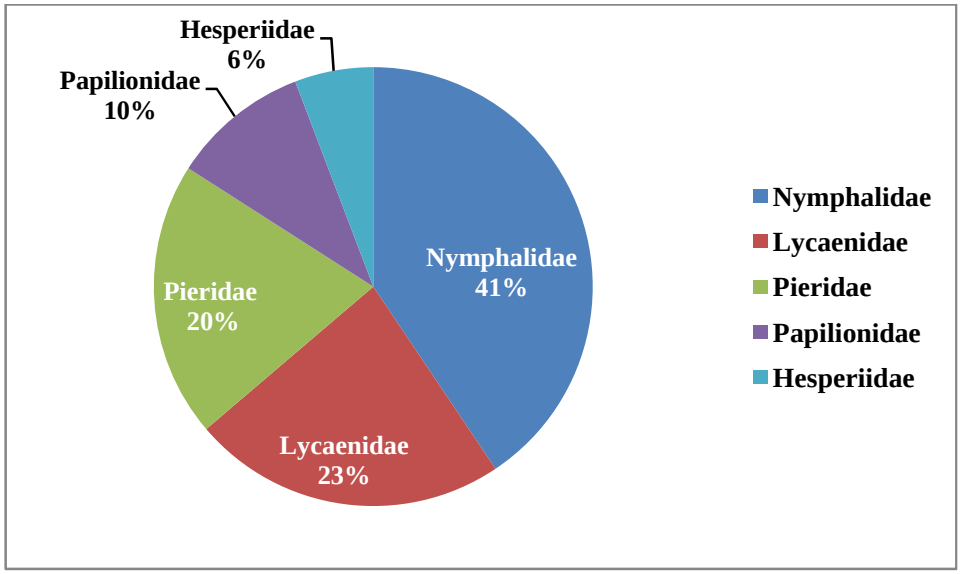


Fig. 3. Family wise percentage composition of butterfly species in the study area.

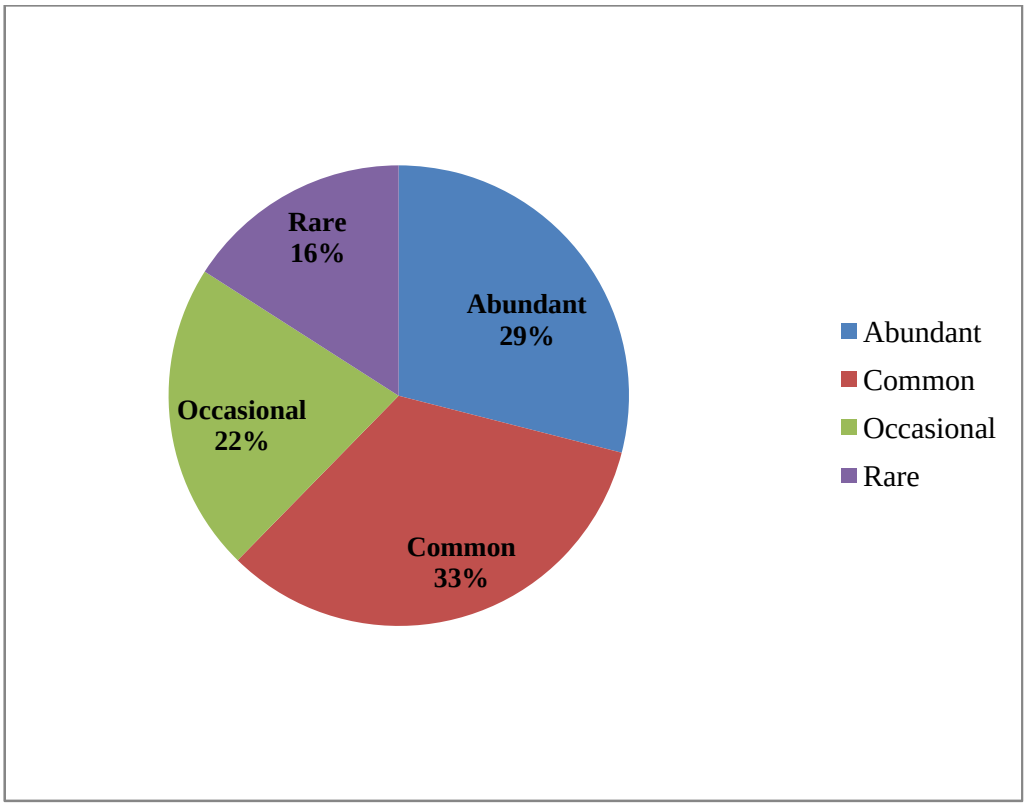
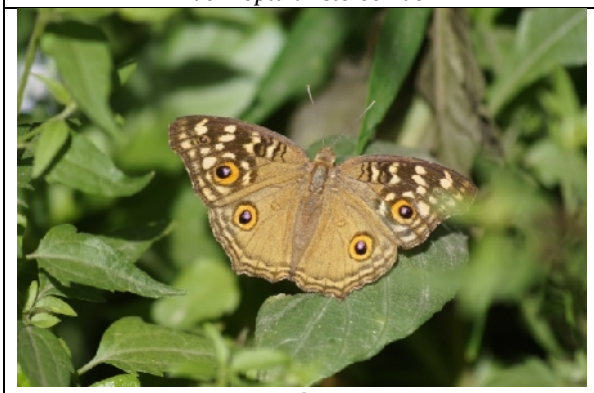


Fig. 4. Family wise percentage composition of butterfly species in the study area.

Pachliopta aristolochiae

Delias eucharis



Junonia lemonias

Euploea core

Castalius rosimon

Spindasis vulcanus

Ixias marianne

Catopsilia pomona

Plate 1: Butterflies of Mahavir Harina Vanasthali National Park

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