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TABLE OF CONTENTS

ADDITION OF A BUTTERFLY GENUS AND SPECIES TO THE INDIAN FAUNA by Roshan Upadhyay, Minom Pertin, Peter Smetacek & Motoki Saito	34
FIRST ENCOUNTER OF INDIGENOUS PREDATORS ON NEW INVASIVE PEST OF GUAVA, WOOLLY WHITEFLY <i>ALEUROTHRIXUS FLOCCOSUS</i> (MASKELL) IN TAMIL NADU, INDIA by K. Elango, S. Jeyarajan Nelson, S. Sridharan & A. Aravind	36
FURTHER ADDITIONS TO THE BUTTERFLY FAUNA OF CHHATTISGARH, INDIA by Anupam Sisodia & Nileshkumar Kshirsagar (I.A.S.)	38
CONFIRMATION OF <i>GRAPHIUM DOSON ELEIUS</i> (INSECTA: LEPIDOPTERA: PAPILIONIDAE) IN DELHI, INDIA by Akash Gulalia	41
NEW RECORD OF <i>PSEUDONEOPONERA RUFIPES</i> (INSECTA: HYMENOPTERA: FORMICIDAE) FROM JHARKHAND, INDIA by Ashirwad Tripathy	43
<i>SAPINDUS LAURIFOLIUS</i> VAHL, 1794 AS A NEW HOST PLANT FOR THE COMMON GUAVA BLUE BUTTERFLY <i>VIRACHOLA ISOCRATES</i> IN GUJARAT, INDIA by Mayur H. Variya	46
CHECKLIST OF BUTTERFLIES (INSECTA: LEPIDOPTERA) FROM MUKUNDARA HILLS TIGER RESERVE, RAJASTHAN by Rohan Bhagat	50
A PRELIMINARY REPORT ON COLEOPTERA FAUNA OF KALYANI (A SUBURBAN CITY), WEST BENGAL, INDIA by Bhim Prasad Kharel, Udipta Chakraborti Kakali Bhadra & Subhankar Kumar Sarkar	55
SEVEN TYPICALLY FRUIT AND SAP FEEDING NYMPHALID BUTTERFLIES RECORDED AT FLOWERS IN THE KUMAON HIMALAYA, INDIA by Rajashree Bhuyan, Shristee Panthee & Peter Smetacek	65
MODIFICATIONS TO THE KNOWN EXPANSE OF INDIAN BUTTERFLIES by Shristee Panthee & Peter Smetacek	69
FIRST RECORD OF BANDED ROYAL BUTTERFLY <i>RACHANA JALINDRA</i> (INSECTA: LEPIDOPTERA: LYCAENIDAE) FROM JHARKHAND, INDIA by Tanya Garg	75
TWO NEW LYCANIDAE SPECIES FOR BHUTAN: <i>BOTHRINIA CHENNELLI</i> (DE NICÉVILLE, [1884]) AND <i>UNA USTA</i> DISTANT, 1886 by Piet Van Der Poel	77
THE ELUSIVE PRINCE <i>ROHANA TONKINIANA</i> IN ARUNACHAL PRADESH: AN ADDITION TO THE BUTTERFLY FAUNA OF INDIA by Minom Pertin, Antonio Giudici, Roshan Upadhyay, Sonam Dorji & Peter Smetacek	79
	32

- INDIVIDUAL ABERRATIONS OF THE COMMON BLUEBOTTLE BUTTERFLY *GRAPHIUM SARPEDON SARPEDON* (INSECTA: LEPIDOPTERA: PAPILIONIDAE) IN INDIA
by Shristee Panthee, Peter Smetacek & Parixit Kafley 81
- TWO INDIAN BILATERAL GYNANDROMORPH BUTTERFLY SPECIMENS
by Rosalynda Moore Wankhar 84
- LESTES PATRICIA TAAMPATTI* **SSP. NOVA** (INSECTA: ODONATA: LESTIDAE) FROM MAHARASHTRA, INDIA
by Shriram Dinkar Bhakare, Sunil Hanmant Bhoite & Pratima Ashok Pawar 85
- DISTRIBUTIONAL RANGE EXTENSION OF THE MOTHS *SOMATINA ROSACEA* (SWINHOE), *PTEROGONIA AURIGUTTA* (WALKER) AND *CARRIOLA FENESTRATA* (HAMPSON) (INSECTA: LEPIDOPTERA) TO THE EASTERN GHATS OF ODISHA
by J.M. Samraj, Sandeep Mishra & H. Sankararaman 92
- A PLAIN TIGER BUTTERFLY *DANAUS CHRYSIPPUS* (INSECTA: NYMPHALIDAE) WITH DYSFUNCTIONAL PROBOSCIS IN CAPTIVITY
by Shantanu Dey & Samarrrth Khanna 95
- CURRENT STATUS OF THE CHINESE PANGOLIN IN SOME COMMUNITY FORESTS OF ARUNACHAL PRADESH, INDIA
by Chiging Pilia, Neeroj Mossang, Dongche Boni, Minam Taggu & Daniel Mize 98
- BUTTERFLY VISITORS TO TWO INVASIVE PLANTS IN THE INDIAN AND BHUTANESE HIMALAYA
by Daya Shanker Sharma, Gyeltshen, Ambica Agnihotri & Peter Smetacek 101

CHECKLIST OF BUTTERFLIES (INSECTA: LEPIDOPTERA) FROM MUKUNDARA HILLS TIGER RESERVE, RAJASTHAN

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Introduction

Butterflies are an ideal subject for ecological studies of landscapes (Thomas & Malorie, 1985). Further, butterflies are good biological indicators of habitat quality as well as general health of the environment (Larsen, 1988; Kocher & Williams, 2000; Sawchik *et al.*, 2005). The following study is the first checklist of the butterflies of Mukundara Hills Tiger Reserve, Rajasthan comprising a total of 45 species belonging to 5 families (Papilionidae, Hesperidae, Pieridae, Lycaenidae and Nymphalidae).

Materials & Methods

Study Area

Mukundara Hills Tiger Reserve (MHTR) (24°47' N, 76° 0' E) is situated at a distance of 56 km from the city of Kota in Rajasthan. It consists of three wildlife sanctuaries, namely, Darrah National Park, Chambal Wildlife Sanctuary and Jaswant Sagar Wildlife Sanctuary. It is located on the eastern bank of the Chambal river. The name is derived from the mountain Mukundara. Earlier, the entire area was known as Darrah Wildlife Sanctuary, which was a hunting preserve for the royal family of Kota. It is spread across four districts-Kota, Bundi, Chittorgarh and Jhalawar-covering an area of 759 sq. km. It consists of a core area of 417 sq. km and a buffer zone covering 342.82 sq. km. MHTR has dry deciduous forest (Champion & Seth, 1968) and is dominated by *Anogeissus pendula*, *A. latifolia*, *Acacia catechu*, *Acacia leucofloeae*, *Zizyphus mauratiana* and *Flacourtia indica*. Mammals recorded in the area include leopard, Indian wolf, sloth bear,

hyena, jungle cat, Indian fox, desert cat, ratel, pangolin, chital, sambar, nilgai and chinkara (Jhala *et al.*, 2015) along with many species of birds and reptiles.

Methods

The survey was done randomly while studying the status of tigers, co-predators and prey in India during the month of November & December, 2014. The observations were taken throughout the day along with the ongoing project work. The majority of observations were done on the forest road passing through Darrah National Park, at various water holes and near the base camp in Jaswant Sagar Wildlife Sanctuary. Photo documentation of the butterflies was done during the study period. No specimen was collected for this study.

Data Analysis

The photographs were identified using available literature. This is the first study of the butterfly fauna of the area. Thus, it provides base line information for further studies. To ascertain the identity of butterflies photographs were taken and species identified with the keys provided by Kehimkar (2008, 2016), Wynter-Blyth (1957) and *Butterflies of India*, v. 2.74, (2020). All butterflies were identified based on photographs. For nomenclature, we followed the latest catalogue by Varshney & Smetacek (eds.) (2015). Since *Pelopidas* (Hesperidae) and *Tarucus* (Lycaenidae) require dissection for confirming identity to species level, we have only reported the genera of both in the following list. Butterflies were classified

according to their abundance in five categories: (Kasambe *et al.*, 2018)

A – Abundant: Seen 80 - 90% of the time in most habitats.

C – Common: Seen 60 - 80 % of the time in most habitats.

U – Uncommon: Seen 40 - 60 % of the time in most habitats.

R – Rare: Seen 20 - 40 % of the time in most habitats.

VR – Very rare: Seen less than 20% of the time in most habitats.

Results & Discussion

Kulshrestha & Jain (2016) have recorded 20 species of butterflies belonging to 4 families (Pieridae, Papilionidae, Lycaenidae and Nymphalidae) at Jhalawar, (Rajasthan). Palot & Soniya (2000) reported 34 species of butterflies from Keoladeo National Park, Bharatpur, Rajasthan. A total of 45 species belonging to 5 families are reported with Nymphalidae and Pieridae being the dominant families among all the reported families.

A total of 45 species were found in during the survey. The family wise abundance was Nymphalidae: 17 species (37.78%); family Pieridae: 15 species (33.33%); family Lycaenidae: 6 species (13.34%); family Papilionidae: 5 species (11.11%) and family Hesperidae: 2 species (4.44%). The butterfly abundance was as follows: Abundant: 8 species; Common: 8 species; Uncommon: 12 species; Rare: 11 species and Very Rare: 6 species.

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Table 1

S N	Family	Common Name	Scientific Name	Abundance
1	Papilionidae	Common Rose	<i>Pachliopta aristolochiae</i> (Fabricius, 1775)	U
2	Papilionidae	Common Mormon	<i>Papilio polytes romulus</i> Cramer, [1775]	C
3	Papilionidae	Lime Butterfly	<i>Papilio demoleus</i> Linnaeus, 1758	U
4	Papilionidae	Tailed Jay	<i>Graphium agamemnon</i> (Linnaeus, 1758)	C
5	Papilionidae	Spot Swordtail	<i>Graphium nomius</i> (Esper, 1799)	U
6	Hesperiidae	Swift	<i>Pelopidas</i> Fabricius, 1798 species	VR
7	Hesperiidae	Indian Palm Bob	<i>Suastus gremius</i> (Fabricius, 1798)	U
8	Pieridae	Mottled Emigrant	<i>Catopsilia pyranthe</i> (Linnaeus, 1758)	R
9	Pieridae	Common Emigrant	<i>Catopsilia pomona</i> (Fabricius, 1775)	A
10	Pieridae	Common Grass Yellow	<i>Eurema hecabe</i> (Linnaeus, 1758)	A
11	Pieridae	Spotless Grass Yellow	<i>Eurema laeta</i> (Boisduval, 1836)	A
12	Pieridae	Psyche	<i>Leptosia nina</i> (Fabricius, 1793)	C
13	Pieridae	White Orange-tip	<i>Ixias marianne</i> (Cramer, [1779])	C
14	Pieridae	Yellow Orange-tip	<i>Ixias pyrene</i> (Linnaeus, 1764)	R
15	Pieridae	White Arab	<i>Colotis phisadia vestalis</i> (Butler, 1876)	R

16	Pieridae	Little Orange-tip	<i>Colotis etrida</i> (Boisduval, 1836)	A
17	Pieridae	Crimson-tip	<i>Colotis danae</i> (Fabricius, 1775)	C
18	Pieridae	Small Salmon Arab	<i>Colotis amata</i> (Fabricius, 1775)	R
19	Pieridae	Common Albatross	<i>Appias albina</i> (Boisduval, 1836)	R
20	Pieridae	Pioneer	<i>Belenois aurota</i> (Fabricius, 1793)	VR
21	Pieridae	Common Gull	<i>Cepora nerissa</i> (Fabricius, 1775)	R
22	Pieridae	Great Orange-tip	<i>Hebomoia glaucippe</i> (Linnaeus, 1758)	VR
23	Lycaenidae	Common Silverline	<i>Spindasis vulcanus</i> (Fabricius, 1775)	U
24	Lycaenidae	Peablu	<i>Lampides boeticus</i> (Linnaeus, 1767)	VR
25	Lycaenidae	Zebra Blue	<i>Leptotes plinius</i> (Fabricius, 1793)	R
26	Lycaenidae	Common Pierrot	<i>Castalius rosimon</i> (Fabricius, 1775)	R
27	Lycaenidae	Pierrot	<i>Tarucus</i> Butler, 1886 sp.	VR
28	Lycaenidae	Gram Blue	<i>Euchrysops cnejus</i> (Fabricius, 1798)	R
29	Nymphalidae	Plain Tiger	<i>Danaus chrysippus</i> (Linnaeus, 1758)	A
30	Nymphalidae	Common Tiger	<i>Danaus genutia</i> (Cramer, 1779)	A
31	Nymphalidae	Glassy Tiger	<i>Parantica aglea</i> (Stoll, [1782])	A
32	Nymphalidae	Common Crow	<i>Euploea core</i> (Cramer, [1780])	C
33	Nymphalidae	Common Evening Brown	<i>Melanitis leda</i> (Linnaeus, 1758)	A
34	Nymphalidae	Dark-branded Bushbrown	<i>Mycalesis mineus polydecta</i> (Cramer, [1777])	VR
35	Nymphalidae	Common Sailer	<i>Neptis hylas varmona</i> Moore, 1872	U
36	Nymphalidae	Common Leopard	<i>Phalanta phalantha</i> (Drury, [1773])	U
37	Nymphalidae	Angled Castor	<i>Ariadne ariadne indica</i> (Moore, 1884)	U
38	Nymphalidae	Yellow Pansy	<i>Junonia hierta</i>	R

			(Fabricius, 1798)	
39	Nymphalidae	Lemon Pansy	<i>Junonia lemonias</i> (Linnaeus, 1758)	U
40	Nymphalidae	Grey Pansy	<i>Junonia atlites</i> (Linnaeus, 1763)	C
41	Nymphalidae	Peacock Pansy	<i>Junonia almona</i> (Linnaeus, 1758)	U
42	Nymphalidae	Blue Pansy	<i>Junonia orithya</i> (Linnaeus, 1758)	R
43	Nymphalidae	Danaid Eggfly	<i>Hypolimnas misippus</i> (Linnaeus, 1764)	C
44	Nymphalidae	Great Eggfly	<i>Hypolimnas bolina</i> (Linnaeus, 1758)	U
45	Nymphalidae	Tawny Coster	<i>Acraea violae</i> (Fabricius, 1793)	U



Fig.1: *Parentica aglea*



Fig.2: *Hebomoia glaucippe*



Fig.3: *Tarucus* sp.



Fig.4: *Pelopidas* sp.