Vol 4 Issue 2 March 2014

ISSN No : 2230-7850

International Multidisciplinary Research Journal

Indian Streams Research Journal

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RNI MAHMUL/2011/38595 **ISSN No.2230-7850**

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Indian Streams Research Journal
ISSN 2230-7850
Volume-4 | Issue-2 | March-2014
Available online at www.isrj.net

BUTTERFLY FAUNA OF NAMBOR AND GARAMPANI WILDLIFE SANCTUARY, ASSAM, INDIA

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Abstract:- The Brahmaputra Valley of Assam plains supports several protected areas for the conservation of the wildlife; also counted among one of the world's biodiversity hotspot regions that has been a biological frontier even in the twenty first century. Nambor and Garampani WLS is one among them; harboring diverse group of plants and animals. Butterflies are the indicators of healthy ecosystem and very sensitive to habitat degradation and pollution, they are also very important group as they are the natural pollinators. The present study provides an array of butterfly diversity of Nambor-Garampani WLS. A total of 123 species/subspecies representing 78 genera and five families have been recorded. The family Nymphalidae was found dominant with 57 [46%] species followed by Lycaenidae 24 [20%], Peridae 18 [15%], Papilionidae 14 [11%] and Hesperidae 10 [8%] species respectively.

INTRODUCTION

Ecological indicators have widespread appeal to scientists, environmental managers, and the general public. Indicators have long been used to detect changes in nature, but the scientific maturation in indicator development primarily has occurred in the past 40 years (Niemi and McDonald 2004). Butterflies are potentially useful ecological indicators of urbanization because they are ready surveyed, and they are sensitive to changes in micro-climate, temperature, solar radiation, and the availability of host plants for ovipositing and larval development (Thomas et al. 1998; Fordyce and Nice 2003). The butterflies are very delicate group of insects having short life span; provide information on biotic and abiotic environmental factors of conservation concern (Fleishman and Murphy 2009). Assumptions have been made in the literature that the presence of all or selected species in a butterfly assemblage is indicative of general environmental attributes, such as conservation value (Mas and Dietsch 2004), environmental health and quality (Gordon and Cobblah 2000; Brown and Freitas 2002; Mouquet et al. 2005). Gaonkar has estimated the presence of 1501 butterfly species in India, that amounts to one fifth of the world of butterfly species (Kunte 2000) out of which Northeast India accounts for nearly a two third [962 species (Evans 1932)] of the species. Some reports of butterflies in certain areas of Northeast India have also been published by various workers (Mason and Niceville 1886; Doherty 1889; Talbot 1939; 1947; Wyanter-Blyth 1957; Saharia 1967; Varshney and Chanda 1971).

MATERIALS AND METHODS:

Study Site

Nambor and Garampani WLS, located within the geographical coordinates 26023' to 26025' N and 93051' to 93055' E (Figure 1) in Karbi Anglong District of Assam. Nambor WLS spreading 37 Km2, contiguous to Garampani WLS covering 6 Km2. It has a total 37 Km2 geographical area. The climatic condition is influenced by the distribution of rainfall that is very high and associated with monsoonal storms (Borthakur 1986). Climate of Brahmaputra valley can be characterized as mesothermal humid climate with moderate temperature with high rainfall during monsoon and low temperature during winter. On the basis of variation of temperature, rainfall and winds, the year may be divided into four distinct seasons such as winter, December to February; pre-monsoon, March to May; monsoon, June to September and retreating monsoon, October to November (Borthakur 1986).

Data Collection

Three permanent transect-lines were set up at each site, approximately 500 m in length. The transect walks were

conducted for adult butterflies during peak Lepidoptera activity (08:00 h- 12:00 h), avoiding rainy and heavily overcast conditions. The pace was; slow but constant, covering the transect-line in about an hour. One to three transects in each season at every site were covered. The order of the sites surveyed was changed on different sampling days to avoid surveying at consistent time periods. At the start of each transect, the time and weather was noted. Each transect was walked by a minimum of two observers, of which one was a local butterfly expert. All butterflies seen in front, to the side, and above the observers were recorded; butterflies behind observers were not counted. Each butterfly observed was identified to species or to the closest taxonomic level. When possible, a photograph was taken of each species and unidentified butterflies for their identification following the reference books. In addition, time observed and activity was recorded for each butterfly. Activity was classified into the following categories: flying (searching or linear), basking or resting (closed or open wing), reproductive (courting, mating, egg laying), feeding, or other (muddpuddling). Other relevant details such as phenophases of the larval foodplants and weather were also recorded.

RESULT AND DISCUSSION:

A checklist of butterfly fauna of Nambor and Garampani Wildlife Sanctuary has been prepared based on the study of butterfly diversity and available literature on the area. A total of 123 species/subspecies representing 78 genera and five families have been recorded. The family Nymphalidae was found dominant with 57 [46%] species followed by Lycaenidae 24 [20%], Peridae 18 [15%], Papilionidae 14 [11%] and Hesperidae 10 [8%] species respectively (Table 1; Figure 2). A previous study by Wynter-Blyth had identified two seasons as peaks, March-April and October, for butterfly abundance in India. However there was no evidence of a peak in summer in this study (Figure 3). The populations were low in spring and summer. From early monsoon the populations started building and showed the first peak in late monsoon, followed by a second peak in winter. During unfavourable season's i.e in spring and summer, a low population was maintained. Some species within a family are likely to be more stress-tolerant and therefore are able to survive in these months. This was irrespective of the larval and adult food availability, and therefore was possibly a consequence of temperature changes and other micro-climatic changes which follow the former.

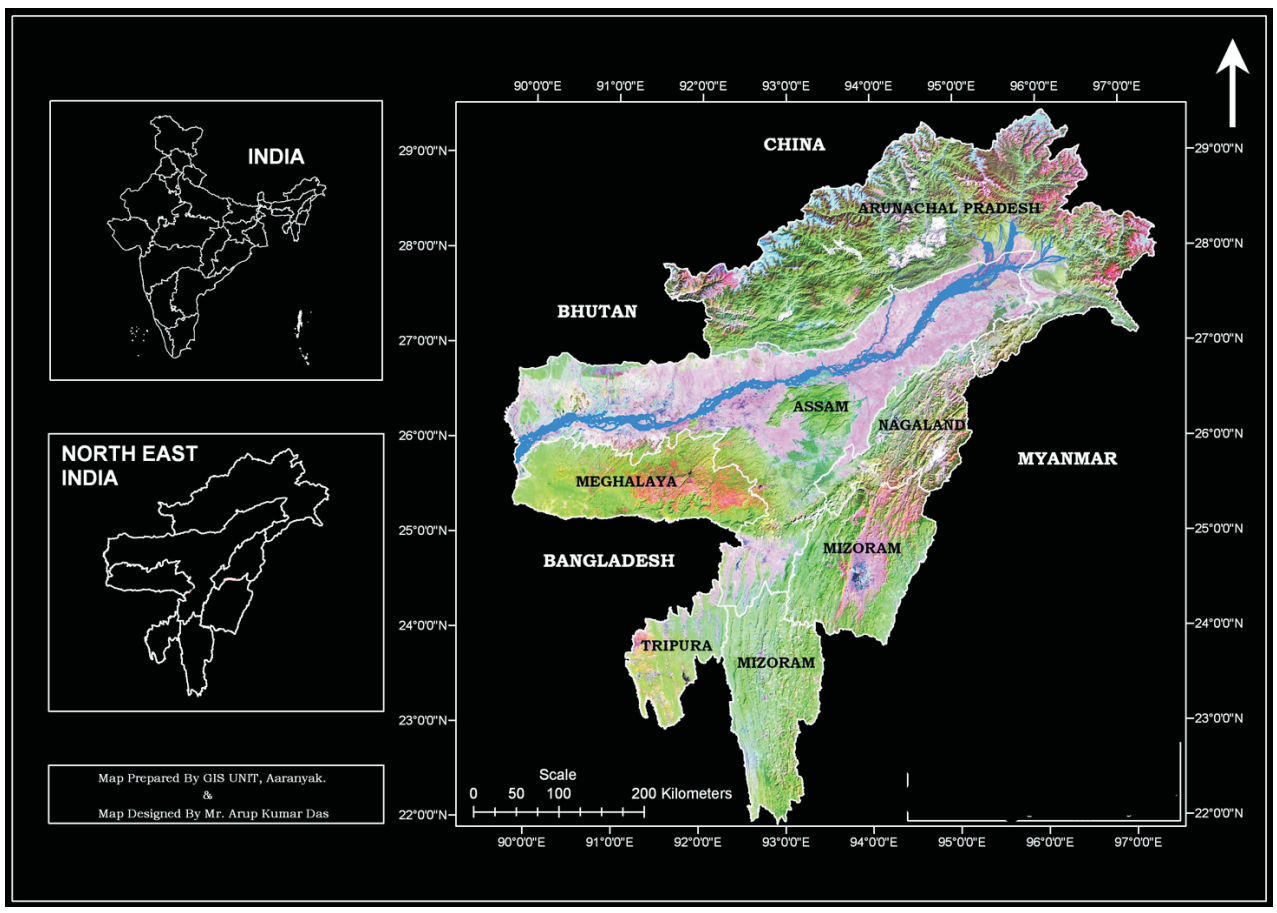
The present study provides an array of butterfly diversity of Nambor & Garampani WLS. The available literature reveals little works in the reserve. There is an urgent need for bridging this information gap to update the database. Exploration of species diversity, understanding the habitat ecology, behavior etc., culminating into a database for the area is an imperative. The butterflies are very delicate group of insects having very short life span. Now a day these butterflies are affected mostly with the diminishing forest area due to anthropogenic pressure, which is not good for the health of our ecosystems. Because, Butterflies are the indicators of healthy ecosystem and very sensitive to habitat degradation and pollution, they are also very important group as they are the natural pollinators. Hence their absence or decline in population will lead to havoc to natural ecosystem balance and food chain of human species along with other consumers.

Table 1: Lists of Butterfly fauna of Nambor and Garampani Wildlife Sanctury.

S/N	Family/ Scientific Name	Common Name	S/N	Family/ Scientific Name	Common Name
	Papilionidae		**63**	*Elymnias pealii*	Paeal's Palmfly
1	*Chilasa clytia*	Common Mime	**64**	*Cyrestis thyodamas*	Indian Map
2	*Chilasa epycides*	Lesser Mime	**65**	*Athyma opalina*	Himalayan Sergeant
3	*Graphium agamemnon*	Tailed Jay	**66**	*Ypthima similis*	Eastern Fivering
4	*Graphium cloanthus*	Glassy Bluebottle	**67**	*Lexias dirtea*	Dark Archduke
5	*Graphium doson*	Common Jay	**68**	*Euploea klugii*	Brown King Crow
6	*Graphium sarpendon*	Common Bluebottle	**69**	*Lexias pardalis*	Archduke
7	*Papilio demoleus*	Lime Butterfly	**70**	*Euthelia monina*	Powdered Baron
8	*Papilio helenus*	Red Helen	**71**	*Cirrochroa aoris*	Yeoman
9	*Papilio memnon*	Great Mormon		**Lycaenidae**	
10	*Papilio polytes*	Common Mormon	**72**	*Acetolepis puspa*	Common Hedge Blue
11	*Pathysa antiphates*	Five-bar Swordtail	**73**	*Pycnophallium elna*	Elbowed Pierrot
12	*Lamproptera meges*	Green Dragontail	**74**	*Castalius rosimon*	Common Pierrot
13	*Graphium agetes*	Four Bar Swordtail	**75**	*Cheritra freja*	Common Imperial

14	*Graphium eurypylus*	Great Jay	**76**	*Curetis bulis*	Bright Sunbeam
	Nymphalidae		**77**	*Heliophorus epicles*	Purple Sapphire
15	*Acraea violae*	Tawny Coster	**78**	*Hypolycaena erylus*	Common Tit
16	*Ariadne merione*	Common Castor	**79**	*Jamides alecto*	Metallic Cerulean
17	*Cethosia biblis*	Red Lacewing	**80**	*Jamides bochus*	Dark Cerulean
18	*Cethosia cyane*	Leopard Lacewing	**81**	*Jamides celeno*	Common Cerulean
19	*Chersonesia risa*	Common Maplet	**82**	*Loxura atymnus*	Yamfly
20	*Cirrochroa aoris*	Large Yeoman	**83**	*Nacaduba kurava*	Transparent 6-line Blue
21	*Cirrochroa tyche*	Common Yeoman	**84**	*Pseudozizeera maha*	Pale Grass Blue
22	*Cyrestis thyodamas*	Common Map	**85**	*Syntarucus plinius*	Zebra Blue
23	*Danaus chrysippus*	Plain Tiger	**86**	*Taraka multistrigatus*	Forrest Pierrot
24	*Danaus genutia*	Striped Tiger	**87**	*Tarucus ananda*	Dark Pierrot
25	*Discophora sondiaca*	Common Duffer	**88**	*Zeltus amasa*	Fluffy Tit
26	*Discophora timora*	Great Duffer	**89**	*Zizeeria knysna*	Dark Grass Blue
27	*Doleschallia bisaltide*	Autumn Leaf	**90**	*Sinthusa nasaka*	Narrow Spark
28	*Elymnias hypermnestra*	Common Palmfly	**91**	*Neopithecus zalmora*	Quaker
29	*Euploea core*	Common Crow	**92**	*Catapaecilma elegans*	Common Tinsel
30	*Euploea midamus*	Blue Spotted Crow	**93**	*Zizina otis*	Lesser Grass Blue
31	*Euploea radamanthus*	Magpie Crow	**94**	*Udara asaka*	White Hedge Blue
32	*Euthalia aconthea*	Common Baron	**95**	*Zemeros flegyas*	Punchinello
33	*Euthalia kesava*	Powered Baron		**Pieridae**	
34	*Hypolimnas bolina*	Great Eggfly	**96**	*Appias lalage*	Plain Puffin
35	*Lebadea martha*	Knight	**97**	*Appias lyncida*	Chocolate Albatross
36	*Lethe europa*	Bamboo Treebrown	**98**	*Catopsillia pyranthe*	Mottled Emigrant
37	*Lethe rohria*	Common Treebrown	**99**	*Delias aglaia*	Red Base Jezebel
38	*Melanitis phedima*	Dark Evening Brown	**100**	*Delias hyperete*	Painted Jezebel
39	*Melanitis leda*	Common Evening Brown	**101**	*Delias descombesi*	Red Spot jezebel
40	*Moduza procris*	Commander	**102**	*Delias thysbe*	Red Breast Jezebel
41	*Mycalesis perseus*	Common Bushbrown	**103**	*Eurema andersoni*	One spot Grass Yellow
42	*Mycalesis visala*	Long-Brand Bushbrown	**104**	*Eurema hecabe*	Common Grass Yellow
43	*Neope confusa*	Banded Treebrown	**105**	*Hebomoia glaucippe*	Great Orangetip
44	*Neptis hylas*	Common Sailer	**106**	*Ixias pyrene*	Yellow Orangetip
45	*Orsotrioena medus*	Nigger	**107**	*Leptosia nina*	Psyche
46	*Pantoporia hordonia*	Common Lascar	**108**	*Pieris brassicae*	Large Cabbage White
47	*Parantica aglea*	Glassy Tiger	**109**	*Pieris canidia*	Indian Cabbage White
48	*Parathyma nefte*	Colour Sergeant	**110**	*Gandaca harina*	Tree Yellow

49	*Penthema lisrada*	Yellow Kaiser	**111**	*Eurema sari*	Chocolate Grass Yellow
50	*Polyura athamas*	Common Nawab	**112**	*Pieris napi*	Green Veined White
51	*Precis atlites*	Grey Pansy	**113**	*Eurema blanda*	Three Spot Grass Yellow
52	*Precis hierta*	Yellow Pansy		**Hesperiidae**	
53	*Precis lemonias*	Lemon Pansy	**114**	*Ancistroides nigrita*	Chocolate Demon
54	*Stibochiona nicea*	Popinjay	**115**	*Coladenia dan*	Fulvous Pied Flat
55	*Symbrenthia liaea*	Common Jester	**116**	*Notocrypta fiesthamelii*	Spotted Demon
56	*Tirumala limniace*	Blue Tiger	**117**	*Notocrypta paralysos*	Common Banded Demon
57	*Vindula erota*	Cruiser	**118**	*Udaspes folus*	Grass Demon
58	*Ypthima asterope*	Common Three Ring	**119**	*Pseudoborbo bevani*	Bevan's Swift
59	*Ypthima baldus*	Common Five Ring	**120**	*Aeromachus pygmaeus*	Pigmy Scrub Hopper
60	*Ypthima hubenri*	Common Forur Ring	**121**	*Oriens goloides*	Common Dartlet
61	*Ypthima sakara*	Himalayan Five Ring	**122**	*Ampittia dioscorides*	Bush Hopper
62	*Charaxes kahruba*	Variegated Rajah	**123**	*Tagiades gana*	Suffused Snow Flat



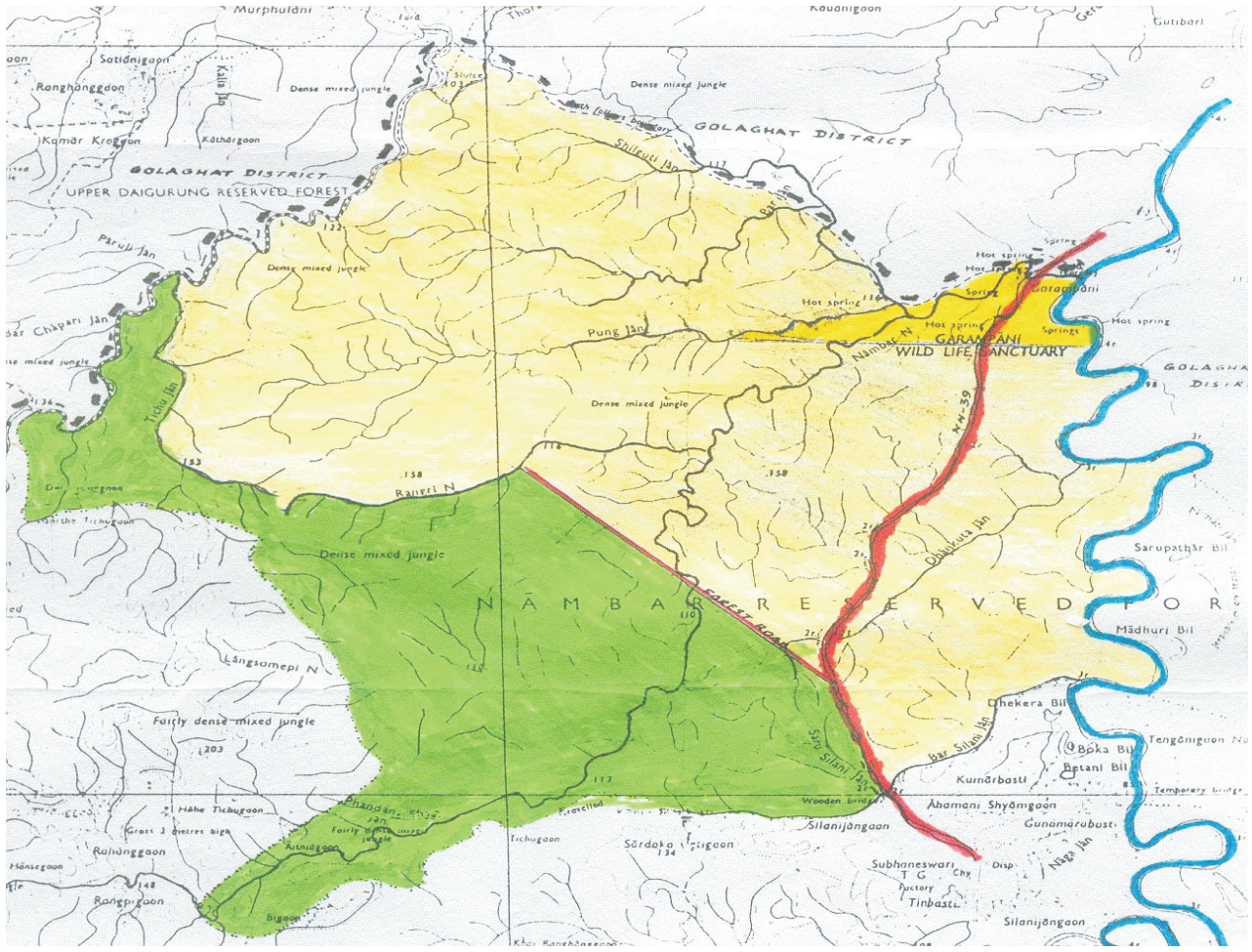
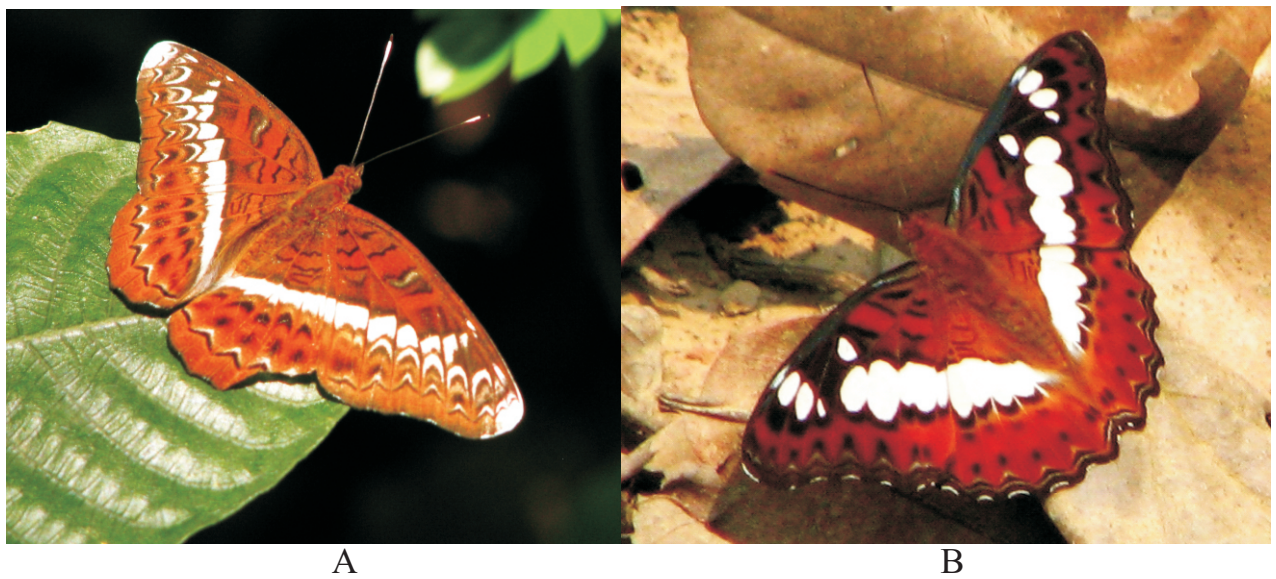


Fig. 1 Map of Study Area.



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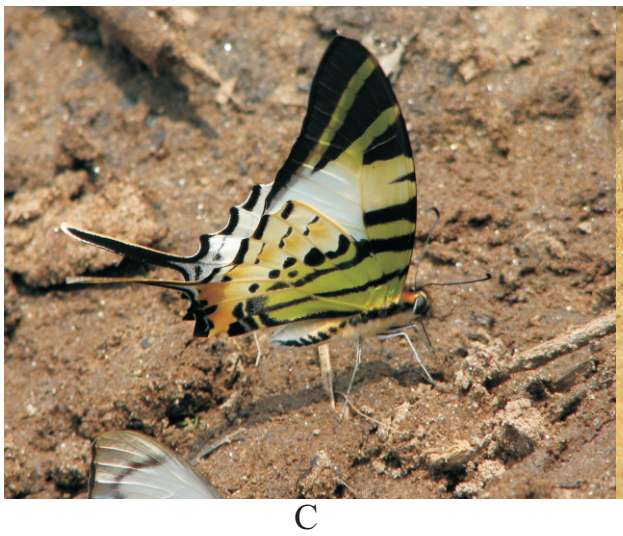

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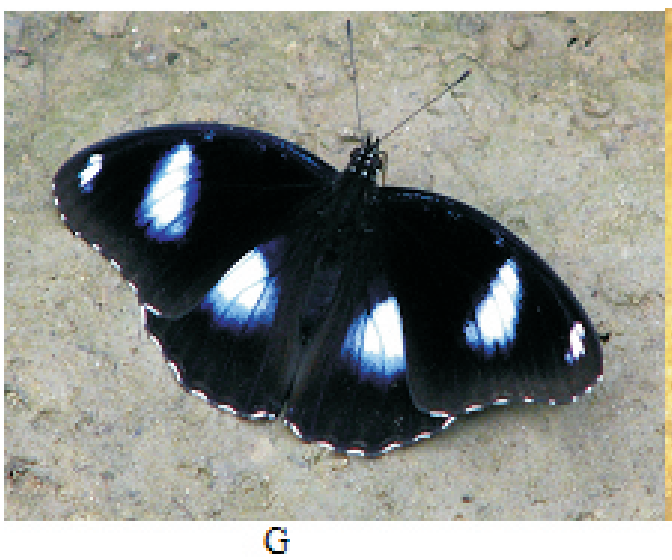

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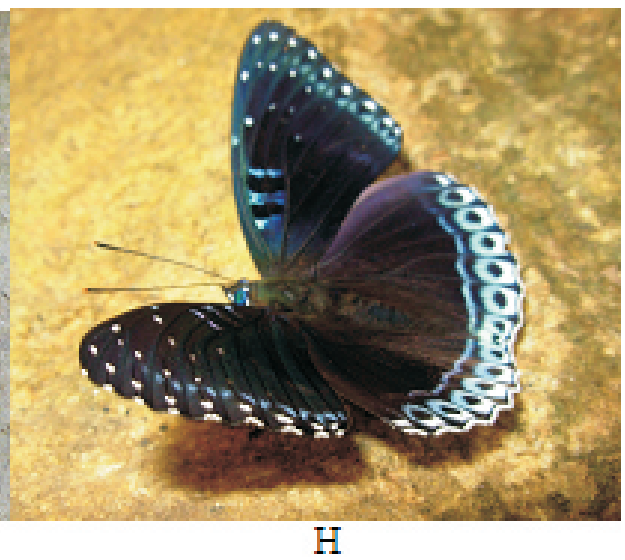

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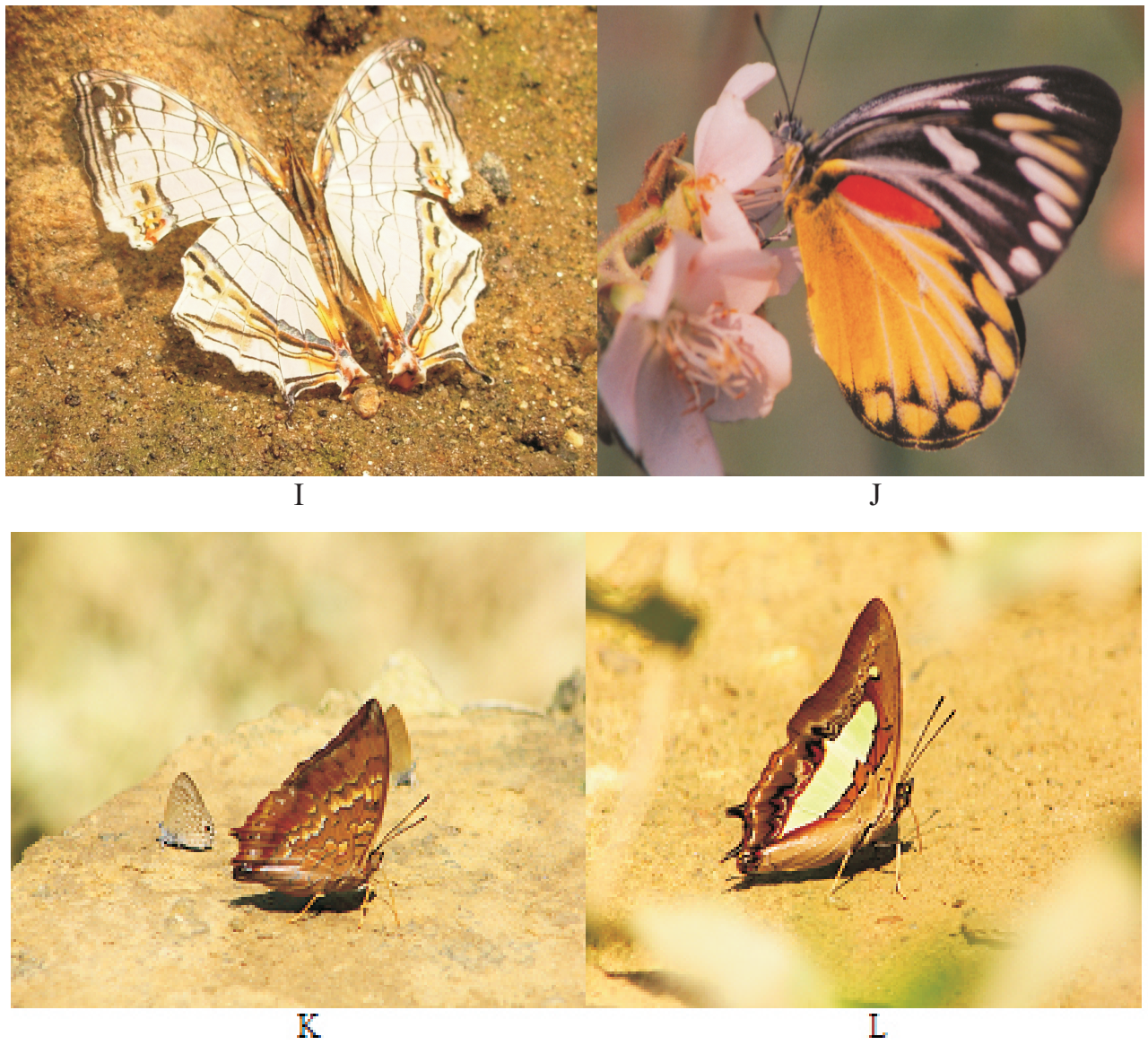

Plate -Represented Butterfly species from Nambor &Garampani

WLS. A- Knight, Lebadea martha; B- Commander, Moduza procris; C- Fivebar Swordtail, Pathysa antiphates; D-Green Dragontail, Lamproptera meges; E-Psyche, Leptosia nina; F-Chocolate Albatross, Appias lyncida; G-GreatEggfly, Hypolimnas bolina; H-Popinjay, Stibochiona nicea. I-Indian Map, Cyrestis thyodamas. J-Red Spot jezebel, Delias descombesi. K-Variegated Rajah, Charaxes kahruba. L-Common Nawab, Polyura athamas.

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