International Journal of Entomology Research
www.entomologyjournals.com
ISSN: 2455-4758
Received: 31-01-2022, Accepted: 15-02-2022, Published: 02-03-2022
Volume 7, Issue 3, 2022, Page No. 26-30

First insect faunal inventory from the recently declared Raimona National Park, Assam, India

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Abstract
Protected areas which are essential for biodiversity conservation often provide habitat and protection from other anthropogenic activities threatened to the pristine wildlife. Therefore, establishment of new protected areas like sanctuaries, biosphere reserve and national parks relieve the wildlife a lot from risk. Before starting conservation and management of the protected areas, one need to know which species are endangered or threatened and what we must conserve. Raimona National Park was declared as the National Park by the Government of Assam on the World Environment Day, 2021. A visit of six days to this national park enumerates 62 species of insects. These includes 41 species of butterflies and 5 species of moths, 3 species of dragonflies, 7 species of grasshoppers and crickets, 3 species of bugs and 3 species of bees and wasps. Only 4 species of butterflies are found here under WPA ACT (1972). This paper presents the first insect inventory from the 6th national park of Assam and the last declared national parks in India.

Keywords: Assam, protected areas, insects, conservation, Raimona National Park

Introduction

Among the global environmental challenge in the 21st century, two major aspects are loss of biodiversity along with the degradation of the environmental quality. Today, change in land-use pattern has not only resulted in a dramatic decrease in total forest cover, but also has adverse effects on insect species composition and richness. Unfortunately, insects are overlooked when inventory of protected areas are concerned or when tropical forest management issues are discussed. Raimona National Park is located within Bodo Land Territorial Region and the national park includes northern part of Ripu Reserve Forest. Raimona national park is surrounded by two tributaries of Bramhaputra, the Sankosh and Saralbhanga rivers in west and east, respectively. While the southern boundary is marked by Pekua river, Raimona National Park also is a part of trans boundary conservation landscape as Jigme Singye Wangchuk national park and Phipsoo wildlife sanctuary of Bhutan with a continuous forest patch. Extinction or loss of biodiversity can be prevented only if we prepare a baseline data of species diversity and their association with the ecosystem. Several researchers investigated different faunal groups from various protected areas of Assam. Gogoi (2013) [1] prepared a checklist of butterflies of Jeypore-Dehing forest. Butterfly inventory of Nambor-Garampani WLS was made by Bawri *et al.*, (2014) [2] and reported 123 species/subspecies representing 78 genera and five families. Joshi and Dhyani (2014) [3] were conducted a detailed survey on butterflies of Dibru-Saikhowa Biosphere Reserve. In 2015, Mudai *et al.*, [4] was also carried out to find out the butterfly fauna present in Nambor–Doigrung Wildlife Sanctuary. Saikia *et al.*, (2015) [5] did a voluminous work on new reports of butterflies and correction of old distributional records of Assam's butterflies which have covered the north and south bank landscape of Assam including the areas of Manas National Parks, Nameri National Park, Gibbon Wildlife Sanctuary, part of Dihing Patkai WLS, Chandubi, Rani- Garbhanga, Jalukbari, Jeypore and, Namrup Reserve Forest.

Unfortunately, nothing has been reported from this newly established national park. With this view an attempt has been made to create a preliminary inventory of the insect fauna of Raimona national park, which will provide an authentic insight into the insect fauna and their ecosystem services of this newly declared national park of Assam.

Materials and Methods

Study area: Raimona National Park located in Assam, India is extended across Gossaigaon and Kokrajhar sub-division of Kokrajhar district. On 09th June 2021; it became as National Park through an Assam Gazette Notification no. FRW.02/2021/27 dtd. 08th June 2021. The Raimona National Park located at the Kachugaon forest division of Gossaigaon subdivision which falls under Kokrajhar district of BTR. It is a part of a contiguous forest patch with an area of 422 km^2 (163 sq. m) covering the northern part of the notified Ripu Reserve Forest of 508.62 km^2 (196.38 sq. m)), which forms the western most buffer to Manas Tiger Reserve in the southern foothills of Eastern Himalaya Biodiversity Hotspot.

Collection and identification of insect fauna: A survey was done from 18/07/21- 24/07/21 on the Raimona National Park just few days after its declaration as a National Park. During the visit the insect fauna were photographed using Nikon Coolpix digital camera P 900 in details which were subsequently identified based on their morphology and behaviour after consultation of standard literature (Wynter-Blyth, 1957 [6]; Kunte, 2000 [7]; Kehimker, 2008 [8]) and the experts of the respective fields.

Fig 1: Study site (A= Map of Raimona NP and adjacent areas, B= Inside the national park (Sanphan Range), C= Inside the national park (Central Range), D= Mud puddling of Yellow Helen)

Results and Discussion

This communication reports only 62 species of insects, among them the predominant group is Lepidoptera (Butterflies & moths). 41 butterfly species belonging to 5 family and 5 species of moths of 4 families were identified during the study (Table 1 & 2). Results suggested that the family Nymaphalidae of the order Lepidoptera with 13 genera and 17 species was the most dominant in the study area which might be related to the polyphagous nature of the representatives of that family (Bora and Meitei, 2014) [9] (Fig. 1). Four species of Butterflies were recorded from this survey area having protected status under Indian Wildlife (Protection) Act, 1972 (Table. 1) [10] & [11]. Beside this, 3 species of dragonflies, 3 species of bees, wasps &ants, 7 species of grasshoppers & crickets and 3 species of bugs were also observed and identified from this newly established national park (Table. 3, 4, 5 & 6). Qualitative estimation of insect diversity within the protected area is extremely important to make an idea about the richness of insect fauna present there. The basic requisite information may help in future to understand their ecological services for this forest ecosystem. Many declared protected areas in the different region of the world often be stayed as just as ‘paper park', due to absence of adequate management policies (Leverington *et al*., 2010) [12]. To avoid such situation, continuous and comprehensive surveys and documentations should be required at least in the initial level for any newly designated protected area. Landscapes in the Earth with extremities in climatic conditions and or inaccessibility to human beings are usually be conserved easily (Pimm *et al*., 2018), [13] Long term monitoring will depict a complete picture of the animal diversity and forest health of the respective protected areas. But the rapid change in the land-use pattern has not only resulted in a dramatic decrease in total forest cover, but also has adverse effects on insect species

composition and richness. Therefore, it is an urgent need to prepare a baseline data of the insect diversity in a protected area or any other forest ecosystem (Mitra, *et al*. 2018) [14]. Political, geographical, and regional position of Raimona national park deserves some extra efforts from the scientific and administrative fraternity of our nation. Qualitative and quantitative estimation of insect diversity, understanding their roles for sustainability of forest ecosystem, realization of networks among the component of such ecosystem might be the ways to generate knowledge and information base for futuristic conservation plans. We hope, this communication is significant, as the baseline data for this important and newly established protected area of India.

Table 1: List of butterfly species observed in Raimona National Park

Family	Sl. no.	Scientific name	Common name	WLPA status	IUCN
Hesperidae	1	*Odontoptilum angulata* (C. Felder, 1862)	Chestnut Angle	NM	NL
	2	*Seseria sambara* (Moore, 1866)	Notched Seseria	NM	NL
	3	*Tagiades japetus* (Stoll, 1781)	Common Snow Flat	NM	NL
	4	*Tagiades gana* (Moore, 1866)	Suffused Snow Flat	NM	NL
	5	*Arnetta atkinsoni* (Moore, 1878)	Black-tufted Bob	NM	NL
	6	*Iambrix salsala* (Moore, 1866)	Chestnut Bob	NM	NL
	7	*Ampittia subvittatus* (Moore, 1878)	Tiger Hopper	NM	NL
Lycaenidae	8	*Anthene emoleus (*Godart, 1824)	Common Ciliate Blue	NM	NL
	9	*Cheritra freja* (Fabricius, 1793)	Common imperial	NM	LC
	10	*Heliophorus epicles* (Godart,1824)	Purple Sapphire	NM	NL
	11	*Castalius rosimon* (Fabricius, 1775)	Common Pierrot	NM	NL
	12	*Prosotas dubiosa* (Semper, 1879)	Tailless Line blue	NM	NL
	13	*Rapala manea* (Hewitson, 1863)	Slate Flash	NM	NL
	14	*Curetis acuta* Moore, 1877	Acute Sunbeam	NM	NL
Nymphalidae	15	*Vargrans egista (*Cramer, 1780)	Vagrant	NM	NL
	16	*Ariadane ariadne* (Linnaeus, 1763)	Angled Castor	NM	NL
	17	*Euploea midamus* (Linnaeus, 1758)	Blue-spotted Crow	Sch II	NL
	18	*Tirumala limniace (*Cramer, 1775}	Blue Tiger	NM	NL
	19	*Junonia iphita* (Cramer, 1779)	Chocolate Pansy	NM	NL
	20	*Mycalesis mineus (*Linnaeus, 1758)	Dark-branded Bush brown	NM	NL
	21	*Ypthima baldus* (Fabricius, 1775)	Common five- ring	NM	NL
	22	*Ypthima huebneri* Kirby, 1871	Common four -ring	NM	NL
	23	*Neptis hylas (*Linnaeus, 1758)	Common sailer	NM	NL
	24	*Hypolimnas bolina* (Linnaeus, 1758)	Great Eggfly	NM	NL
	25	*Eoploea radamanthus* (Fabricius, 1793)	Magpie crow	Sch IV	NL
	26	*Pantaporia hordonia* (Stoll, 1790)	Common Lascar	NM	NL
	27	*Tanaecia lepidea* (Butler,1868)	Grey Count	Sch II	NL
	28	*Junonia lemonias* (Linnaeus, 1758)	Lemon Pansy	NM	NL
	29	*Charaxes moori* Distant, 1883	Malayan Nawab	Sch I	NL
	30	*Orsotriaena medus* (Fabricius, 1775)	Medus Brown	NM	NL
	31	*Charaxes bernardus hierax* C. & R. Felder, 1867	Variable Twany Rajah	NM	NL
Papilionidae	32	*Graphium sarpedon* (Linnaeus, 1758)	Common Bluebottle	NM	NL
	33	*Graphium doson* (C. & R. Felder)	Common Jay	NM	NL
	34	*Graphium antiphates* (Cramer, 1775)	Five-bar Swordtail	NM	NL
	35	*Papilio paris Linnaeus*,1758	Paris Peacock	NM	NL
	36	*Graphium agamemnon (*Linnaeus,1758)	Tailed Jay	NM	NL
	37	*Papilio nephelus (*Boisduva, 1863l)	Yellow helen	NM	NL
Pieridae	38	*Eurema hecabe* (Linnaeus,1758)	Common Grass Yellow	NM	NL
	39	*Hebomoia glaucippe* (Linnaeus, 1758)	Great Orange-tip	NM	NL
	40	*Leptosia nina* (Fabricius, 1793)	Psyche	NM	NL
	41	*Gandaca harina* (Horsefield, 1829)	Tree yellow	NM	NL

Table 2: List of moths species recorded from different areas within Raimona National Park

Sl no.	Family	Scientific name
1	Geometridae	*Dysphania militaris* (Linnaeus,1758)
2	Hyblaeidae	*Hyblaea constellata* Guenee, 1852
3		*Hyblaea* sp
4	Noctuidae	*Ischyja manlia* Cramer 1776
5	Uraniidae	*Micronia aculeata* Guenee, 1857

Table 3: List of dragonflies and damsel flies of order odonata recorded from study sites

Sl. No.	Family	Scientific name	Common name
1	Libellulidae	*Crocothemis servilia* Drury, 1770	Scarlet Skimmer
2		*Orthetrum sabina* Drury, 1770	Green Marsh Hawk
3		*Potamarcha congener* Rambur, 1842	Yellow-tailed Ashy Skimmer

Table 4: Recorded bees, wasps and ants species of order hymenoptera at Raimona National Park

	Family	Scientific name	Common name
1	Formicidae	*Camponotus sericeus* (Fabricius, 1798)	-
2	Vespidae	*Polistes* sp.	Potter wasp
3	Sphecidae	*Sceliphron madraspatanum* (Fabricius, 1781)	Mud dauber

Table 5: Recorded grasshoppers & crickets as representatives of Raimona National Park

Family	Sl. No.	Scientific name
Pyrgomorphidae	1	*Tagasta sp.*
Acrididae	2	*Diabolocatantops innotabilis* (Walker, 1870)
	3	*Phlaeoba antennata antennata* Brunner von Wattenwyl, 1893
	4	*Acrotylus humbertianus* Saussure, 1884
	5	*Phlaeoba infumata* Brunner von Wattenwyl, 1893
	6	*Choroedocus robustus* (Serville, 1839)
Gryllidae	7	Unidentified

Table 6: Recorded bugs as representatives of Raimona National Park

	Family	Scientific name	Common name
1	Coreidae	*Acanthocephala* sp	Leaf-footed bug
2		*Homocerus* sp	Leaf-footed bug
3	Reduviidae	*Rhynocoris* sp	Assassin bug

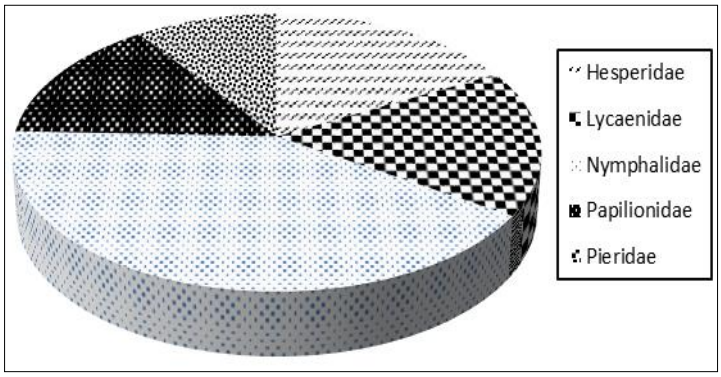

Fig 2: Percentage distribution of butterfly family recorded in Raimona National Park

Acknowledgements
Authors acknowledge Swamy Kamalasthananda, Principal Maharaj, Ramakrishna Mission Vivekananda College, Rahara, West Bengal for giving us opportunity to prepare this manuscript. We thank DFO, Mr. Bhanu Sinha, Kachugaon and Ranger, Mr. P. Talukdar, Gosaigaon of Raimona National Park, Assam for permitting us to conduct the study and providing us logistic support in different areas of this national park. We also thank to all the Forest staffs of Raimona National Park for their extensive help and support during our visit.

References
1. Gogoi MJ. A preliminary checklist of butterflies recorded from Jeypore-Dehing forest, eastern Assam, India. Journal of Threatened Taxa,2013:5(2):3684-3696.
2. Bawri M, Mandal J, Basumatary R. Butterfly Fauna of Nambor and Garampani Wildlife Sanctuary, Assam, India. Indian Streams Research Journal,2014:4(2):1-8.
3. Joshi RK, Dhyani S. Butterflies diversity, distribution and threats in Dibru-Saikhowa Biosphere Reserve Assam North-East India: A Review. World Journal of Zoology,2014:9(4):250-259.
4. Mudai P, Kalita J, Nandi Das G, Boruah B. Notes on some interesting butterflies (Lepidoptera) from Nambor-Doigrung wildlife Sanctuary, North East India. Journal of Entomology and Zoology Studies,2015:3(3):455-468.

5. Saikia MK, Kalita J, Saikia PK. Ecology and conservation needs of Nymphalid butterflies in disturbed tropical forest of Eastern Himalayan biodiversity hotspot, Assam, India. International Journal of Biodiversity and Conservation,2009:1(7):231-250.
6. Wynter-Blyth MA. Butterflies of the Indian region. Bombay Natural History Society, Bombay, 1957, 523.
7. Kunte K. Butterflies of Peninsular India. Indian Academy of Sciences, Universities Press (India) Limited, 2000, 254.
8. Kehimker I. The Book of Indian Butterflies. Pub: BNHS, Bombay, 2008 497.
9. Bora A, Meitei LR. Diversity of butterflies (Order: Lepidoptera) in Assam University campus and its vicinity, Cachar district, Assam, India. Journal of Biodiversity and Environmental Sciences,2015:5(3):328-339.
10. Anonymous. The Wildlife (Protection) Act, 1972 (53 of 1972) as amended by the Wildlife (Protection) Amendment Act, 2002. 2003b. Universal Law Publishing Co. Pvt. Ltd. 126pp.
11. Anonymous. The Wildlife (Protection) Act 1972, 2006: Natraj Publishers.
12. Leverington F, Lemos CK, Ravese H, Lisle A, Hocking M. A global analysis of protected area management effectiveness; Environmental Management,2010:46:685-698.
13. Pimm SL, Jenkins CN, Li BV. How to protect half of earth to ensure it projects sufficient biodiversity; Science Advances,2018:4(eaat2616):1-8.
14. Mitra B, Basu Roy A, Das A Shah, SK Baidya S, Roy Chaudhury D, Mukherjee D *et al*. Insect faunal diversity of chintamani kar bird sanctuary and other protected areas of West Bengal. International Journal of Entomology Research,2018:3(2):180-189.