Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 6, Issue, 03, pp.5853-5856, March, 2014

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

FIRST TIME REPORTING OF THREE DIFFERENT ENTOMOFAUNA AT THE DISTRICT OF COOCHBIHAR, WESTBENGAL

***Chatterjee, P., Biswas, I., Banerjee, A. and Palit, P.**

Department of Conservation Biology, Durgapur Government College, Burdwan, Westbengal, India

ARTICLE INFO

Article History:
Received 19th December, 2013
Received in revised form
10th January, 2014
Accepted 15th February, 2014
Published online 31st March, 2014

Key words:

Biodiversity Conservation,
Rashikbil,
South Khayerbari,
Insect Diversity,
New Report.

ABSTRACT

An Insect diversity survey was carried out at Rashikbil wetland Region and South Khayerbari, Westbengal, India. The diurnal insect diversity was very high, with a mean of twenty eight species recorded during our exploration. Diurnal insects were only photographed through digital camera to prevent injury and damage. A pitfall trap study were mediated in Rasikbil wetland Region for quantitative assessment of surface dwelling forms. A total of seven order and seventeen families were identified from both of the study sites. Twelve species were recorded from Rashikbil Wetland Region and eighteen species from South Khayerbari Eco park of which three species were never been reported from these sites previously. Such findings provide important data to enhance the need and effort in biodiversity conservation. Forest fires, illegal hunting for wild animals and orchids, felling of trees and agricultural activities are among the threats to these sites which directly affect its insect diversity. To mitigate these threats, it is important to adopt a multi-disciplinary and participatory approach in a smart partnership involving relevant stakeholders and the local communities in monitoring, enforcement and promoting environmental awareness.

INTRODUCTION

Spatial Heterogeneity or heterogeneous distribution of species over the world is one of the fascinating event of the evolution and adaptation phenomena of life. Researchers from various fields have proposed many theories for the cause and the most favourable and accepted theory is the latitudinal gradient. Division of Earth by mathematical lines have proposed that regions between the Horse Latitudes are the most diverse in number. The more we get far from the equator the diversity of species declines. Thus regions near or at the equator contain the most indigenous and endemic species which are demarcated as the Biological hotspots of the world by Myers *et al.* (2000). Eastern Himalayan Region is one of these hotspots situated over Indian Territory. Rasikbeel Wetland Region and South Khayer Bari are regions of these hotspots at the foothills in the District of Coochbihar of West Bengal, India. These two said regions contain high number of insect diversity still unexplored by the scientists. There is no reporting of species from these regions while it has much more to give. Species like Golden Tortoise Beetle (*Charidotella* sp.), Hasselt's Spine back Orb Spider or spiny orb-weaver spider (*Gasteracantha* sp.), Lynx spider (*Oxyopes* sp.) etc. are numerous and abundant in these regions. Whereas the Forest officials are completely unaware of these facts and they do not contain any proper checklist of these insects over these regions lacking the conservation efforts while the grasp of humans are engulfing their natural habitats in the formation of urban cities and development of modern Societies. Sikkim another state of India at the foothills of Himalaya were observed for its insect diversity and was reported as fauna of Sikkim (Ramakrishna and Alfred, 2006) where it shows 3656 species under 13 orders were found. Obviously the regions of West Bengal should have as much diversity as it is not much of far from the Sikkim or neither it contains any geographical barriers to restrict any. These areas must be searched extensively as it contains many insect fauna that is very much distributed over the Indo-Malayan territories like *Zemeros flegyas* a butterfly commonly termed as the Punichello is found at these regions of West Bengal and also in the countries like Sumatra, Java, Borneo, South China, Malaya etc (Kumar, Rose and Sidhu, 2011). Mostly from the North-Eastern India only the butterflies or the order Lepidoptera has been studied either or only some of the selective insect fauna study has been carried out. Agricultural pests are also studied. But overall estimation has never been conducted which is the most important of all at first. Under these circumstances we explored these habitats for a rapid and preliminary short term overall assessment of insect fauna in these biodiversity rich regions. The present investigation were carried out to characterise the habitat on the basis of its diverse insect fauna.

***Corresponding author: Chatterjee, P.** Department of Conservation Biology, Durgapur Government College, Burdwan, Westbengal, India.*

Study Site

The present investigation was mediated at the two sites of Northern region of West Bengal, India. First site was Rasikbeel Wetland Region located under Toofanganj sub-division of the Coochbihar district (26°21' N, 89°40 ' E). It is a vast Natural Wetland with an areal coverage of 178 hector. The territorial jurisdiction of the forest area falls under Coochbihar Social Forestry (CSF) division. The individual wetlands within the Region are cut-off meanders in genesis formed due to abrupt change of course of rivers surrounding the beels, which is common in the Sub-Himalayan region. Main Raidhak River is about 7 km away in the western side, general slope is toward the south. The site is free from any type of industrial pollution with a pleasant landscape. Within the Region a small zoo has been created where it holds a number of animals from Crocodiles (*Gavialis* sp) to Spotted Deers (*Axis axis*). Area have mainly natural tree forest along the wetland along with many herbs and shrubs. Fern is most abundantly present with its diversity at the region along with luxurious growth of epiphytes.

The second site was at the Khayer Bari Eco-park situated 10 km from the Madarihut of Coochbihar district. The park holds mainly a Leopard Rehabilitation Center along with a Leopard Safari. This site also contains the diverse fern and Orchid population. Within the park dense vegetation harbours the diverse type of insect fauna. Short-horned Grasshoppers are the most abundant here.

Figure 1. Study sites at the Foothills of Eastern Himalayan Region: A - South Khayer bari, B - Rasikbil Wetland Region

MATERIALS AND METHODS

During our study we visited each of the sites for only one day for approximately two hours. We were equipped with Digital cameras and the insects were noted by means of digital image. No live specimen was collected neither any of them were captured to reduce the anthropogenic influence. Also a pitfall trap study (Hansen and New, 2005) was conducted at the Rasikbil Wetland Region to determine the nocturnal insect species diversity. The study was conducted on 14.05.13 at the site 1 and on 16.05.13 on the site 2 from the afternoon till the dark. The weather was normal with a clear sky and the temperature was around 28 degrees. The study was carried on by traversing through the bush populations of the sites and henceforth photographed the encountered species continuously. While the searching and capturing of the images were in progress, the vegetations were encountered with safety to reduce the damage. For the fast assessment of the abundance of the species at the study sites due to the shortage of proper time, they were calculated frequently and rapidly depending on the how many times the species were encountered in front of the eyes. Depending on their sighting a gradation table was created where species seen more than 70 percent of the total species were termed Most Common and designated as "+++", species seen more than 40 percent to up to 70 percent were termed Common and designated as "++" and species seen below 40 percent were termed Less Common and designated as "+". A pitfall trap is a trapping pit for small animals, such as insects, amphibians and reptiles. Pitfall traps are mainly used for ecology studies and ecologic pest control. Animals that enter a pitfall trap are unable to escape, and may either be killed by the trap or remain unharmed. This is a form of passive collection, as opposed to active collection where the collector catches each animal (by hand or with a device such as a butterfly net). Active collection may be difficult or time consuming, especially in habitats where it is hard to see the animals such as thick grass or leaf litter.

Our motive for pitfall study was to explore the insect diversity of forest floor. Three Pitfall traps were settled at the Rasikbil wetland Region. The study place was covered by Ferns, creepers and small saplings at the ground. So, the place was inspected carefully for the insect affected plant leaves, larvae or eggs to track their realized niche. After inspection three pitfall trap places were chosen, and they were near a tree trunk, mud heap, and near the water of the wetland. Therefore three plastic glasses were used in this case. We dug out hole at the

sites, as much as 10 cm deep and placed the glasses inside the hole. The glasses were filled with soap water measuring less than half of its length, carefully so that the soap water doesn't fall around the trap else the insects wouldn't come to the trap. The traps were settled for three days. They were monitored for 12 hr interval and the trapped insects were collected. The digital images from the overall study were brought back to the institute and was identified properly by following standard books and guides. Insects of order Lepidoptera were identified by the field guide of Kehimkar, Odonata by the Subhramaniam, and others by Fauna of India of Michael and Sharma, Fauna of British India, A concise guide to Insects by Patrick Hook, A concise guide to Butterflies and insects by Elizabeth Batmer, Insect Plant Biology by Vanloon, Dick, Forest Entomology by Bipin Bihari, Entomology by Gillot.

RESULTS AND DISCUSSION

At the study time, the environmental conditions were normal as shown in Table no 1. The entire study revealed 28 species from the two study sites with three species unreported previously from these regions. As per the collected data showed in Table 2 for the first study site at Rashikbil wetland region the most abundant species were *Pardosa* sp (water spider) of class Arachnida, *Scopula* sp of order Lepidoptera, *Oxyopes* sp(Lynx spider) of class Arachnida, *Rhyothemis variegata* (Common Picture Wing) of order Odonata and least abundant was *Gasteracantha sp* (Spiny orb-weaver spider) of class Arachnida as recorded in Table no 2.

Table no 3 represents the list of insects and spider of south Khayerbari. *Zemeros flegyas* (Punichello) is a butterfly of order Lepidoptera found most abundant in this region as there were *Neptis sp* (Common Sailer) and *Zizeeria karsandra* (Dark Glass Blue). *Atractomorpha lata*, a short horned grasshopper was the most abundant among the order Orthoptera in this study site where as *Rhyothemis variegata* (Common Picture Wing) of order Odonata was found most in occurrence. Among the spiders *Opadometa fastigiata* (Pear shaped Leucauge) was found to be most common and *Phrynocaria eberti* (Lady Bird Beetle) from the order Coleoptera. Least abundant at this study site was *Astycus lateralis* (Green weevil) of order Coleoptera.
Among the twenty eight species at the first site (Table no 2) *Charidotella sexpunctata* or Golden Tortoise Beetle of order Coleoptera, family Chrysomelidae has not been reported from this area. From the second study site (Table no 3) two species were never been reported and these species are *Xenacatantops humilis*, a cricket of order Orthoptera and *Leptocentrus taurus*, a tree hopper of order Hemiptera.

Each day collection of the trapped insects and those photographed were identified up to their order, genus and respective individuals were recorded carefully. Lack of proper time made the study of the sites to a limitation. Class Insecta under the Phylum Arthropoda is known to contain the most number of animals in the entire Earth. They are also the most diverse animals in the Earth. The ability to fly is also a boon of the evolution to them except the birds. Their simple but varying body structure had made them different from each

Table 1. Environmental Conditions During The Study Time

No. of Sites	Air Temp (C)	Light Intensity (LUX)	Relative Humidity (%)	Wind Speed (Km/h)
South Khayerbari	28°	703 x 10	68.3	1 - 1.4
Rasikbil Wetland Region	28°	902 x 10	67	1 - 1.1

Table 2. List of Insects Found At Rashikbil Wetland Region

Common Name	Scientific Name	Class	Order	Family	Abundance
Handmaiden Moth	*Auriculoceryx sp.*	Insecta	Lepidoptera	Arctiidie	++
Water Spider	*Pardosa sp*	Arachnida	Araneae	Lycosidae	+++
Huntsman Spider	*Olios sp*	Arachnida	Araneae	Sparassidae	++
Moth	*Scopula sp*	Insecta	Lepidoptera	Geometridae	+++
Mantis	*Hierodula membranacea*	Insecta	Mantodea	Mantidae	++
Lynx Spider	*Oxyopes sp*	Arachnida	Araneae	Oxyopidae	+++
Golden Tortoise Beetle	*Charidotella sexpunctata*	Insecta	Coleoptera	Chrysomelidae	++
Wolf Spider	*Lycosa sp*	Arachnida	Araneae	Lycosidae	++
Spiny orb-weaver spider	*Gasteracantha sp*	Arachnida	Araneae	Araneidae	+
Common Picture Wing	*Rhyothemis variegata*	Insecta	Odonata	Libellulidae	+++
Cucurbit Leaf Beetle	*Aulacophora indica*	Insecta	Coleoptera	Chrysomelidae	++
Black backed Cucumber Beetle	*Aulacophora sp*	Insecta	Coleoptera	Chrysomelidae	++

Table 3. List of Insects Found at South Khayerbari

Common Name	Scientific Name	Class	Order	Family	Abundance
Punchinello	*Zemeros flegyas*	Insecta	Lepidoptera	Riodinidae	+++
Common sailer	*Neptis sp.*	Insecta	Lepidoptera	Nymphalidae	+++
Dark Grass Blue	*Zizeeria karsandra*	Insecta	Lepidoptera	Lycaenidae	+++
The Glassy Tiger	*Parantica aglea*	Insecta	Lepidoptera	Nymphalidae	++
Green weevil	*Astycus lateralis*	Insecta	Coleoptera	Curculionidae	+
Short Horned Grasshopper	*Atractomorpha lata*	Insecta	Orthoptera	Pyrgomorphidae	+++
Cricket	*Xenacatantops humilis*	Insecta	Orthoptera		+
Orb-Weaver Spider	*Argiopesp sp.*	Arachnida	Araneae	Araneidae	++
Cockroach	*Pycnoscelus sp.*	Insecta	Blattodae	Blaberidae	++
Leaf Beetle	*Lema sp.*	Insecta	Coleoptera	Chrysomelidae	++
Tree Hopper	*Leptocentrus taurus*	Insecta	Hemiptera	Membracidae	++
Plant Hopper	*Ricania sp*	Insecta	Hemiptera	Ricaniidae	++
Golden Tortoise Beetle	*Charidotella sexpunctata*	Insecta	Coleoptera	Chrysomelidae	++
Common Picture Wing	*Rhyothemis variegata*	Insecta	Odonata	Libellulidae	+++
Leaf Beetle	*Platycorynus sp*	Insecta	Coleoptera	Chrysomelidae	++
Mantoida	*Mantoida sp*	Insecta	Mantodea	Mantoididae	++
Pear shaped Leucauge	*Opadometa fastigiata*	Arachnida	Araneae	Tetragnathidae	+++
Ladybird Beetle	*Phrynocaria eberti*	Insecta	Coleoptera	Coccinellidae	+++

other with just a minute change in the arrangement. They are abundant in every corner of the Earth from Arctic to the Antarctica, from mountains to sea floor they are everywhere. Most abundant in the regions of Tropical rainforests they are but no less in the dry deserts. The higher taxa subphylum Hexapoda contains over 1 million described species still to date. The phylum Arthropoda itself contains 12,42,040 species whereas the entire Kingdom Animalia contains 15,32,329 species. This number is more than 80%. The class Insecta contains 66% of the species of the world. 59,353 species (Varshney, 1998) of insects are found in the India under 619 families. But there are many areas in the India to be studied still unexplored and thus the chances are to increase in the number of insect species occurrence in India. The areas that we have studied obviously seems to be rich diverse in terms of Entomofauna. Over our little time at the study site reveals three species not reported from that area before. A plant hopper *Leptocentrus taurus* of Membracidae family, order Hemiptera is known to be abundant at the South Khayer bari Nature Park but not found at the Rasikbil wetland area during the survey. This species is also can be used to control the exotic species *Parthenium* as biological control agent (Kumar, 2009) but has never been reported from this location before. Another interesting species is the Golden tortoise beetle (*Charidotella sexpunctata*) abundant at the both sites never before reported from these areas. Next comes the *Xenacatantops humilis* a cricket of order Orthoptera. We had found the Nymph of the species. It has been never reported from this area. It is also known to be found in the Indo-Malaysian Region.

Conclusion

Current modernisation and urbanisation in these areas, uncontrolled anthropogenic activity within the protected areas and poor management of these areas are putting these animals in danger for existence. Once within the extinction vortex, these species cannot be recovered as no major projects are ever undertaken to revive their population. Insects have never been taken under conservation procedures as they are micro wildlife in nature and they are mostly understood as of lower value in terms of conservation though their contribution is of far concern. Here forth the study concludes that these regions must be studied for further findings before they are lost or else their biological as well as economical values will be gone forever.

Acknowledgement

Authors are hereby thankful to Mr. Ayan Mondal of Eco campers, an NGO of Burdwan, West Bengal, India for helping in the identifications. We all are hereby grateful to him.

REFERENCES

Azad Thakur N.S, Firake D.M, Behere G.T., Firake P.D, Saikia K.2012. Biodiversity of agriculturally important insects in North-Eastern Himalaya: An overview. *Indian Journal of Hill farming*.25(2):37-40.

Chung A.Y.C, Chew S.K.F, Majapun R. and Nilus R.2013. Insect Diversity of Bukit Hampuan Forest Reserve, Sabah, Malaysia. *Journal of Threatened Taxa*.5(10):4461-4473.

Chutia B.C, Rahman A, Sharma M., Barthakur B.K. and Barthakur M.2012. Hyposidra talaca (Walker) : A major defoliating pest of tea in north east India. *Two and A Bud*.59:17-20.

Dagyom K. and Gopi GV.2009.Ethnozoology of Galo tribe with special reference to edible insects in Arunachal Pradesh. Indian *Journal of Traditional Knowledge*.8(1):81-83.

Das S, Roy S, Mukhopadhyay A. 2010. Diversity of Arthropods natural Enemies in the Tea Plantations of North Bengal with Emphasis on Their Association with Tea Pests. *Current Science*.99(10):1457-1463.

Ghosh L.K.1998.Faunal Diversity of India: Hemiptera. *Envis Center,ZSI*.234-235.

Kumar D, Naidu B. 2010.A Contribution Towards the Insect Fauna of Vadodara, Gujrat (India): The order Hemiptera.*Halters*.1(2):58-63.

Kumar S. 2009. Biological Control of Parthenium in India: Status and Prospects. *Indian Journal of Weed Science*. 41(1and2):1-18.

Samanta R.K. and Ghosh I.2012.Tea Insect Pests Classification Based on Artificial Neural Networks. *International Journal of Computer Engineering Science.* 2(6):1-13.

Tandon, S. K. and Hazra, A. K. 1998. Faunal diversity in India : Orthoptera. ENVIS Centre, Zool. Surv. India, : 183-188.

Tandon, S. K. and Shishodia, M. S. 1991. Orthoptera : Grylloidea. Animal Resources of India. Pub.: Zool. Surv. India, 263-265.

Tandon, S. K., Hazra, A. K. and Shishodia, M. S. 1991. Orthoptera : Acrididae. Animal Resources of India. Pub.; Zool. Surv. India, 271-273.

Myer N, Muttermeier RA, Muttermeier CA, da Fornseca GAB, Kent J 2000. Biodiversity hotspots for conservation priorities. Nature 403: 853–858

****