

A note on the biodiversity of insects collected from a college campus of Jhalawar District, Rajasthan

Roopam Kulshrestha and Nita Jain

Department of Zoology, Government Post Graduate College, Jhalawar and Department of Zoology, Government Post Graduate College, Kota, Rajasthan India

ABSTRACT

The study of biodiversity of insects was conducted in the college campus which covers around half square kilometer area. One boundary of college campus is along NH12. The major vegetation of college campus is neem, banyan, Asoka and amaltas trees and some ornamental and medicinal plants. The main objective of the study was to determine the insect diversity and the relative abundance of the insect species in the campus. The collection of insects was carried out by using sweep nets, hand picking and beating tray in the month of Feb.-March and Sept-Oct in the year 2012. Species diversity and abundance of insects were investigated in college campus and we recorded insects belonging to 7 orders 16 families and 38 species. The largest number of insect identified were of Lepidoptera followed by Hymenoptera, Odonata, Hemiptera, Orthoptera, Coleoptera and Neuroptera. Anthropogenic activities influenced the abundance of insect orders. Thus, greater numbers of insects were observed in small gardens with a greater proportion of bare soil relative to concrete pathways and places with human interference. The study revealed the higher abundance of butterflies among the insects identified. A total 38 different insect species were recorded giving an indication of the species diversity of the college campus.

KEY WORDS: ABUNDANCE, BIODIVERSITY, INSECTS, JHALAWAR

INTRODUCTION

Biological diversity is one of the most fascinating aspects of biology. Evolution by natural selection has produced, and is still producing different species. Biodiversity also encompasses functioning, intact plant and animal communities and the processes that affects them. Today

India, is occupying a significant space, documenting nearly 7 percent of global faunal diversity. There are 1.4 millions species of insects described in the scientific literature which is 80% of life currently recorded on earth. The estimation indicates there may be as many as 30-50 million species of insects making this perceives terrestrial orthopodial groups 97% of global diversity.

ARTICLE INFORMATION:

*Corresponding Author: kulsroopam@gmail.com

Received 5th June, 2016

Accepted after revision 29th June, 2016

BBRC Print ISSN: 0974-6455

Online ISSN: 2321-4007



Thomson Reuters ISI SCI Indexed Journal

NAAS Journal Score : 3.48

© A Society of Science and Nature Publication, 2016. All rights reserved.

Online Contents Available at: <http://www.bbrc.in/>

(Erwin, 1982, 1983b, Ghosh, 1990, 1994, Hammond, 1992, Hammond, 1999, Chandra 2011, Patel *et.al.* (2015) and Ditchkoff, 2016).

Great insect diversity is indeed an intrinsic part of the Earth's ecosystem. They are what make the ecosystems tick, remarked (Samways, 1994). However, the insect fauna of India is vast. In the present study the largest number of species (21) identified was of order Lepidoptera. In India the researches work of Sharma *et.al.* (2012) in foothills of Itanagar, Arunachal Pradesh; Parandhaman 2012) in different habitats from Tamilnadu part of Western Ghats; Kaneria *et.al.* (2013) in Bilaspur District, Chhattisgarh; Qureshi *et.al.* (2013) in District Kupwara from Jammu and Kashmir State; Saikia (2014) in Gauhati University campus, Assam; Arya *et al.*, (2014) in and around Kumaun University, Nainital, Uttarakhand; all these workers have provided valuable information on various insects and butterflies with reference to their diversity and abundance.

A comprehensive account of insect diversity of Sikkim has been provided by Chandra (2011) where insect diversity of Sikkim, was studied. Altogether, 5892 species belonging to 2382 genera under 261 families and 22 orders of Insect have been reported from the state of Sikkim. In an intensive study made by Patel *et.al.* (2015) in Jabalpur Community Forest Reserve, a total of 774 individual of insects from 13 orders were recorded during the study. A preliminary study on abundance and diversity of insect fauna in Gulbarga District, Karnataka, India was conducted by Belamkar and Jadesh in 2012. A total of 11,318 insects from 6 orders, 26 families and 54 species were recorded.

In present investigation the insects were collected from the Post Graduate Government College campus, Jhalawar. Insects live in highly diverse habitats and could be found practically everywhere on the campus. In present study, collection of most of the insects (species) was done, between 1100 -0200 hrs and twice in the year 2012; in the month of Feb.-March and Sept-Oct. Majority of the insects were collected from all sorts of plants: grass, flowers, weeds, shrubs and trees. Some were found around and on the walls of building blocks. The main objective of this study was to collect and identify insect species, diversity and abundance of insects in the college campus, Jhalawar. Vegetation of campus was of mixed type which includes trees, climbers, grass, medicinal plants, shrubs, ornamental plants and herbs. Many groups of insects recognized were: Lepidoptera, Hymenoptera, Odonata, Hemiptera, Orthoptera, Coleoptera and Neuroptera. They are unique in their own way and have an important ecological role for survival of life on Earth.

Most of the insects in this study were collected manually i.e. by sweep netting, hand picking and beating tray

or by visual search method. Collected insects were transferred in bottles for killing that contains cotton soaked with ethyl acetate covered with lid. Later on specimens were sorted out into different taxonomic groups. All the specimens were stretched, pinned, labeled and left for 72 hrs to prevent decomposition. As some species dragonflies were sighted in very few numbers in college campus, it was difficult to catch them, but we have taken the best possible photographs of those dragonflies. Identification of insects was done at IARI New Delhi and MPUAT, Udaipur. A total of 38 individuals belonging to 07 orders were recorded from the campus of Government College Jhalawar.

Insects of 07 orders belonging to 16 families 38 species were collected and identified. Maximum species of Lepidoptera identified was 21 in number belonging to 5 families. In other parts of Rajasthan abundance of Lepidoptera individuals was observed. The extensive studies on Lepidopterous insects associated with vegetables were conducted indifferent localities of Aravalli Range of Rajasthan i.e. Mount Abu, Udaipur, Rajsamand, Pushkar, Ajmer, Jaipur, Sikar, Jhunjhunu, Sariska, Alwar, Dausa and Bharatpur during 2008-11.

A total of 38 species of Lepidopterous insects associated with vegetables in Aravalli Range of Rajasthan were recorded, out of 152 species of Lepidopterous insects recorded from India (Sharma, 2011). Further in the present study, number of identified species was followed by Hymenoptera (5), Odonata (4), Hemiptera (3), Orthoptera (3), Coleoptera (1) and Neuroptera (1). The 5 species of Hymenoptera belonging to 3 families; 3 species of Hemiptera belonging to 2 families were identified.

Likewise number of species of Odonata identified was 4, belonging to 2 families which were captured and identified by Koli *et al.*, in the year 2014 in a study, of south Rajasthan, which explored the diversity and species composition of Odonata.. Odonates were sampled from 13 localities i.e., Pichola lake, Udaisagar lake, Badi lake, Ghasa lake, Menar lake, Badwai lake, Rup sagar lake, Rolitodgarh Wildlife Sanctuary, Sitamata Wildlife Sanctuary, Karmoi river stream in Sitamata WLS, College campus, Rajsmand lake and Meja dam.

In the present study, out of these insects, individuals of the order Lepidoptera: *Terias hecabe* and *Lampides boeticus*, were found to be dominant (Table:1.1), while minimum was of beetle (*Coleoptera*) *Chrysocoris chinonsis* and (*Neuroptera*) *Crolen species*; as shown in the table. In Central India a total of only 10 species of ground beetles were recorded (All the species were recorded for the first time from Melghat Tiger Reserve) Thakare *et al.*, (2013) and in our study we have recorded only one species of beetle.

Table 1: Identified Insects in College Campus, Jhalawar; Year 2011-12

S. NO.	ORDER	FAMILY	GENUS SPECIES	ABUNDANCE (Approx. no. of insects)
1.	Lepidoptera	Pieridae	<i>Ixias marianne (Linnaeus)</i>	22
2.	Lepidoptera	Pieridae	<i>Catopsilia pyranthe</i>	14
3.	Lepidoptera	Pieridae	<i>Terias hecabe (Linnaeus)</i>	152
4.	Lepidoptera	Pieridae	<i>Catopsilia pomona</i>	27
5.	Lepidoptera	Pieridae	<i>Anaphaeis aurota (Fabricius)</i>	12
6.	Lepidoptera	Pieridae	<i>Eurema laeta (Boisduval)</i>	16
7.	Lepidoptera	Pieridae	<i>Appias albina (Boisduval)</i>	22
8.	Lepidoptera	Nymphalidae	<i>Junonia lemonias</i>	25-30
9.	Lepidoptera	Nymphalidae	<i>Junonia (Precis) atlites (Linnaeus)</i>	28
10.	Lepidoptera	Nymphalidae	<i>Junonia almona</i>	18
11.	Lepidoptera	Nymphalidae	<i>Junonia orithya</i>	37
12.	Lepidoptera	Nymphalidae	<i>Danaus chrysippus (Linnaeus)</i>	45
13.	Lepidoptera	Nymphalidae	<i>Telchinia violae (Fabricius)</i>	4
14.	Lepidoptera	Nymphalidae	<i>Parantica aglea</i>	12
15.	Lepidoptera	Papilionidae	<i>Pachliopta aristolochiae</i>	8
16.	Lepidoptera	Papilionidae	<i>Papilio demoleus</i>	11
17.	Lepidoptera	Papilionidae	<i>Zetides agamemnon</i>	12
18.	Lepidoptera	Lycaenidae	<i>Lampides boeticus</i>	250
19.	Lepidoptera	Lycaenidae	<i>Catochrysops enjus</i>	68
20.	Lepidoptera	Lycaenidae	<i>Castalius rosimon</i>	5
21.	Lepidoptera	Arctiidae	<i>Utethesia pulchella</i>	3
22.	Hymenoptera	Apidae	<i>Xylocopa fenestrata</i>	9
23.	Hymenoptera	Apidae	<i>Apis florea</i>	24
24.	Hymenoptera	Apidae	<i>Apis dorsata</i>	46
25.	Hymenoptera	Vespidae	<i>Ropalidia marginata</i>	38
26.	Hymenoptera	Sphécidae	<i>Liris species</i>	9
27.	Odonata	Lebellulidae	<i>Orthetrum taeniolatum (schreides)</i>	18
28.	Odonata	Lebellulidae	<i>Neurothemis intermedia intermedia (romber)</i>	18
29.	Odonata	Lebellulidae	<i>Brachythemis cantaminata (fabricui)</i>	22
30.	Odonata	Coenagrionidae	<i>Ceriagrion coromandelianun (fabricui)</i>	21
31.	Hemiptera	Pentatomidae	<i>Halys parvus (chopra)</i>	19
32.	Hemiptera	Pentatomidae	<i>Erthesina fullo (Thunberg)</i>	45
33.	Hemiptera	Lygacidae	<i>Spilostethus pandurus</i>	55
34.	Orthoptera	Acrididae	<i>Catantops karnys / pinguis</i>	20
35.	Orthoptera	Acrididae	<i>Acrididae exalatata</i>	28
36.	Orthoptera	Tettigonidae	<i>Himertula pallisignata</i>	14
37.	Coleoptra	Buprestidae	<i>Chrysocoris chinonsis</i>	2
38.	Neuroptera	Myrmeleonidae	<i>Creoleon spc.</i>	16

It is concluded that a small compact area like a segregated college campus supports a diverse butterfly community. Similar type of study on insect biodiversity has been carried out by Grampurohit and Karkhanis (2013). However, the results which are being presented in this

paper might be the first comprehensive list of insects in the Jhalawar district. Hopefully, there will be a further research study on the insect biodiversity of this area, in order to get better and comprehensive information on those aspects to be documented for future reference.

ACKNOWLEDGEMENTS

We would like to express our heartiest gratitude to Dr. Swamynathan (ICAR Network Project on Insect Biosystematics, Department of Entomology, Rajasthan College of Agriculture, MPUAT), Udaipur and Dr. V. V. Ramamurthy (Insect Identification Service Division of Entomology, Indian Agricultural Research Institute, New Delhi-110012) for helping us in identifying insects up to species level.

REFERENCES

- Amala S. , Rajkumar M. and Anuradha V.(2011) Species Richness of Butterflies in the Selected Areas of Siimalai Hills. *Int. J. Pure Appl. Sci. Technol.*, 6(2), Pages. 89-93
- Arya M. K., Dayakrishna and Chaudhary R.(2014) Species richness and diversity of Butterflies in and around Kumaun University, Nainital, Uttarakhand, India. *Journal of Entomology and Zoology Studies*; 2(3) Pages: 153-159
- Belamkar N. V. and Jadesh M. (2014) A Preliminary Study on Abundance and Diversity of Insect Fauna in Gulbarga District, Karnataka, India. *International Journal of Science and Research*. Volume 3 No.12 Pages:1670-1675
- Chandra K. (2011) *Insect Diversity Of Sikkim, India* Pages 181-206
- Ditchkoff S.(2016) *Biodiversity and Ecosystem Management*, Oklahoma State University.12:1.
- Grampurohit B. and Karkhanis H. (2013) *Insect Biodiversity At Mangrove Ecosystem*. National Conference on Biodiversity : Status and Challenges in Conservation - 'FAVEO' Pages:108-115
- Koli V.K. ,Bhatnagar C. and Shekhawat D.S. (2014) Diversity and Species Composition of Odonates in Southern Rajasthan, India. *Proc Zool Soc.Springer*
- Muhammad A. (2009) Diversity, Species Richness And Evenness Of Moth Fauna Of Peshawar. *Pak. Entomol.*31: 2.
- Parandhaman D. (2012) Diversity of butterflies in different habitats from Tamilnadu part of Western Ghats (Lepidoptera: Rhopalocera). Savarimuthu Ignacimuthu et al./ *Elixir Appl. Biology* 51.Pages: 10861-10865.
- Patel D.R. (2015) Diversity and abundance of insect species at Madhya Pradesh forest. *International Journal of Multidisciplinary Research and Development*; 2(3): Pages: 304-307
- Qureshi A.A Bhagat and R.C. and P.C. Pathania (2013) Rhopalocera Diversity (Lepidoptera) of District Kupwara from Jammu and Kashmir State (India). *Biological Forum – An International Journal* 5(1):Pages:100-106
- Samways M.J. (1994) *Insect Conservation*. EOLSS Publications
- Sharma G.(2011) Studies on Lepidopterous Insects Associated with Vegetables in Aravali Range, Rajasthan, India. *Biological Forum -An International Journal*, 3(1) Pages: 21-26
- Singh M.P.; Dey S; Singh S. B.(2004) *Conservation of biodiversity and natural resources*. Daya Publishing House, Delhi.
- Thakare V.G.,Zade V.S. and Hegde V.D. (2013) Ground beetles (Coleoptera: Carabidae) of Melghat Tiger Reserve, Central India. *New Biological Reports* 2(2) Pages: 173-176