



A preliminary study on the moth diversity (Lepidoptera: Heterocera) of University of Science and Technology Meghalaya, India

Baishali Dhar, Golphina Ahmed*, Alika Borphukan Borah

Department of Zoology, University of Science and Technology Meghalaya, Ri-Bhoi, Meghalaya, India

Abstract

Moths are nocturnal in nature they are also phytophagous in nature, some of them are agricultural pests. This is the first study about the diversity of moth fauna in university of science and Technology Meghalaya. During the survey found 52 species with 48 genera and 9 families, Based on the number of species the family erebidae was the most dominant with 21 species and 40 %, crambidae with 21%, sphingidae with 13 % and followed by the other families geometridae 6%, noctuidae 6 %, saturnidae 4%, zygaenidae 4%, tortricidae 2% uraniidae 4%. The highest number of genera also found in the family erebidae.

Keywords: Diversity, moth, Meghalaya

Introduction

More than half of the world's known animal species are insects among which Lepidoptera is the second largest and more diverse order in the class in secta. The order Lepidoptera consists of both moth and butterfly. The word 'lepidos' means scales and 'ptera' means wings. Lepidoptera is one of the most diverse group with 1,57,424 described species globally (van Nieukerken *et al.*, 2011) [15] among them 12000 species of moth have been reported from India (Chandra and Nema, 2007) [7]. Moths are phytophagous and nocturnal in nature. They are very sensitive to climate changes and vegetation alternations, making them an important group for monitoring climate and habitat changes (Thomas, 2005) [9]. Many of them are nocturnal and feed on the plants and are almost entirely associated with plants that largely depend on animal assisted pollution (Wahlberg *et al.* 2013) [16]. This polyphyletic groups of insect represent more than 90% of all lepidopteran of the earth and a large number of moth species are still waiting to be discovered mostly in the tropical regions of the world (Heppner, 2008) [8]. Moths play a major role in pollinating night blooming flowers (Singh *et al.* 2017) [12]. Meghalaya is one of the beautiful state of north east India now it is divided into 12 districts. Ri-bhoi district is situated in this state and the district occupies an area of 2448 km². It is bounded in the north by Kamrup district of Assam east by Jayantia hills and Karbi Anglong district of Assam and on the west by West Khasi hills on the South by East Khasi Hills. The District is most popular because of the Umiam lake and dense forests. The present study were conducted in the University of Science and Technology Meghalaya Campus which coming under the Ri Bhoi District of Meghalaya. The university covers approximately 400 acres area. The campus is situated 26. 1030⁰ N and 91.8464⁰ E in the hilly area. The temperature ranges from 10⁰ C to 30⁰ C from December to July Month.

Material And Methods

Moths were surveyed primarily by the use of light trap and some were found by day time during field visits. The survey was conducted from February 2021 to December 2021. As the moths are nocturnal in nature the survey was started from evening 6 PM onwards till morning on next day by using LED bulb light trap with a white cloth screen. The moths were photographed with the Mobile Phone (Redmi Note 11 Pro) on the cloth screen four times in a month. Some specimens were collected killed by ethyl acetate and pinned in insect stretching board. Specimens were preserved in insect box. Each specimen was provided with a label indicating the locality and date of collection. After collection all specimens were deposited in the Salim ali museum of biological diversity, department of zoology USTM. The specimens were identified with help of available literature Bell and Scott (1937) [3], Kirti and Singh (2015) [10], Shubhalaxmi (2018) [13] and internet sources.

Result

During this study period, a total of 52 moth species belong to 9 families and 48 genera were found in the study area. Out of 52 species 21 species belongs to family erebidae, 11 species to the crambidae followed by sphingidae 7 species, geometridae 3 species, noctuidae 3 species, saturnidae 2 species, zygaenidae 2 species tortricidae 1 species uraniidae 2 species. Based on the number of species the family erebidae was the most dominant with 21 species and 40 %, crambidae with 21%, sphingidae with 13 % and followed by the other families geometridae 6%, noctuidae 6 %, saturnidae 4%, zygaenidae 4%, tortricidae 2% uraniidae 4%. The highest number of genera also found in the family erebidae Table 1. Showing the list of the speices found in this area with their family and Fig1: Showing the species richness of moth fauna with reference to their families. Moths are found highest in the summer season in compare to the winter.

Table 1: Showing the list of moth species found in the study area

SI No	Family	Genus	Species	Author and Year
1.	Erebidae	Nyctemera	<i>N. lactinia</i>	Grote 1873
2.		Cyana	<i>C. puella</i>	Drury, 1773

3.			<i>C. perornata</i>	Walker, 1854
4.		Arna	<i>A. bipunctapex</i>	Hampson, 1891
5.		Arctornis	<i>A. submarginata</i>	Walker, 1855
6.		Hypena	<i>H. laceratalis</i>	Walker, 1859
7.		Spilosoma	<i>S. oblique</i>	Walker, 1855
8.		Eressa	<i>E. confinis</i>	Walker, 1854
9.		Pseudoblabes	<i>P. oophora</i>	Zeller, 1853
10.		Dasychira	<i>Dasychira spp</i>	Walker, 1855
11.		Cretonotus	<i>C. transiens</i>	Walker, 1855
12.		Amata	<i>Amata Spp</i>	Rego Barros, 1956
13.		Pareuchaetes	<i>P. pseudoinsulata</i>	Hampson, 1893
14.		Tussock	<i>Tussock spp</i>	Fabricius, 1775
15.		Euproctis	<i>E. lutea</i>	Fabricius, 1775
16.		Anomis	<i>A. flava</i>	Linnaeus, 1763
17.		Cretonotus	<i>C. gangis</i>	Cramer, 1779
18.		Trigonodes	<i>T. hyppasia</i>	Schaller, 1788
19.		Erebus	<i>E. terminitincta</i>	Gaede, 1938
20.		Miltochrista	<i>M. gratiosa</i>	Walker, 1854
21.		Barsine	<i>B. rufumdefecta</i>	Walker, 1855
22.	Geometridae	Hyposidra	<i>H. infixaria</i>	Walker, 1860
23.		Cosmostola	<i>C. laesaria</i>	Walker, 1861
24.		Agathia	<i>A. lycaenaria</i>	Kollar, 1848
25.	Noctuidae	Acontia	<i>A. lucida</i>	J.S. Hufnagel 1766
26.		Bastilla	<i>B. crameri</i>	Moore, 1855
27.		Dysgonia	<i>D. algia</i>	Linnaeus, 1767
28.	Saturniidae	Antheraea	<i>A. paphia</i>	Linnaeus, 1758
29.		Attacus	<i>A. atlas</i>	Linnaeus, 1758
30.		Maruca	<i>M. vitrata</i>	Fabricius, 1787
31.	Crambidae	Diaphania	<i>D. indica</i>	Saunders, 1851
32.		Botyodes	<i>B. diniasalis</i>	Walker, 1859
33.		Heortia	<i>H. vitessoides</i>	Moore, 1855
34.		Omiodes	<i>O. tristrialis</i>	Bremer, 1864
35.		Isocentris	<i>I. filialis</i>	Guenee, 1854
36.		Spoladea	<i>S. recurvalis</i>	Fabricius, 1775
37.		Cydalima	<i>C. laticostalis</i>	Guenee, 1854
38.		Patania	<i>P. balteata</i>	Fabricius, 1798
39.		Cnaphalocrocis	<i>C. poeyalis</i>	Boisduval, 1833
40.		Pleuroptya	<i>P. iopasalis</i>	Walker, 1859
41.	Sphingidae	Elibia	<i>E. dolichus</i>	Westwood, 1847
42.		Daphnis	<i>D. nerii</i>	Linnaeus, 1758
43.		Macroglossum	<i>M. corthus</i>	Walker, 1856
44.		Pergesa	<i>P. acteus</i>	Walker, 1856
45.		Acherontia	<i>A. styx</i>	Westwood, 1847
46.		Theretra	<i>T. nessus</i>	Drury, 1773
47.			<i>T. oldenlandidae</i>	Fabricius, 1775
48.	Zygaenidae	Cyclosia	<i>C. panthona</i>	Stoll, 1780
49.			<i>C. papilionaris</i>	Drury, 1773
50.	Tortricidae	Epiphya	<i>E. spostbittana</i>	Walker, 1863
51.	Uraniidae	Micronia	<i>M. eculeata</i>	Guenee, 1857
52.			Lyssa	<i>L. zampa</i>

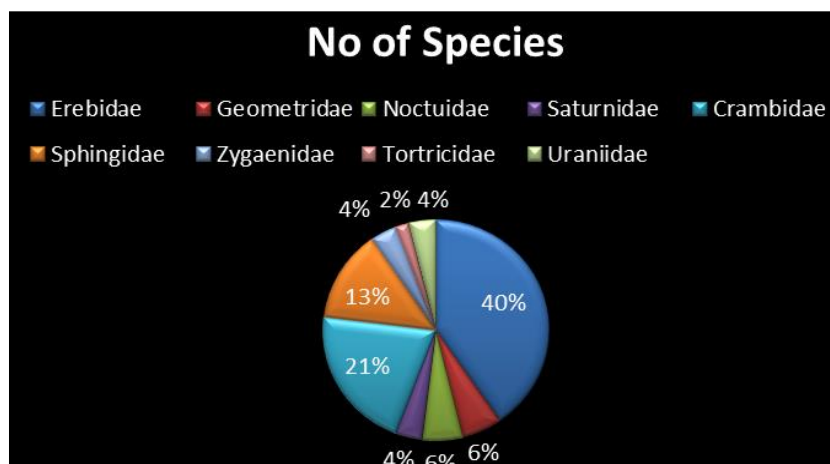


Fig 1: Species Richness of moth fauna with reference to their families

Conclusion

In the present study found 52 species of moth, only 3 species were identified upto genera level rest of them are identified upto species level. In this study we found some agricultural pest moths like *Diaphania indica* is a serious pest of cucurbit crops, *Maruca vitrata* is a pest of laguminous crops, *Cretonotus gangis* is a minor pest sweet potato, groundnuts etc on the other hand found silk moths like *Antheraea paphia* which produces tasar silk. *Attacus atlas* is the worlds largest moth also found in the campus, *Lyssa Zampa* found rarely in this area. Moths are found highest in the summer season. Some moths belonging to the family erebidae, crambidae, noctuidae are the major and minor pests of different agricultural crops but saturnidae sphingidae are beneficial for the environment because saturnidae family moths produce silk and sphingidae work as a good pollinators in the environment. In 2017 ^[2] Arandhara *et al.*, reports 333 macro moth species for the Tinsukia district of Assam, India. The moth fauna of the family Arctiidae of Arunachal Pradesh was studied by Arora & Chaudhury (1982), Kirti *et al.* (2005) ^[11] inventoried 105 species of the family Arctiidae from northeastern India. But, the information on moth fauna of Ri bhoi District has been very poorly studied and very few species are reported. This study will help to know more about the moth fauna of this area.

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