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**A.T.M.F. Islam**

*Institute of Food & Radiation  
Biology, Atomic Energy  
Research Establishment,  
G.P.O.Box-3787, Dhaka-  
1000, Bangladesh*

**M.H. Islam**

*Institute of Food & Radiation  
Biology, Atomic Energy  
Research Establishment,  
G.P.O.Box-3787, Dhaka-  
1000, Bangladesh*

**A.S.M. Saifullah**

*Institute of Food & Radiation  
Biology, Atomic Energy  
Research Establishment,  
G.P.O.Box-3787, Dhaka-  
1000, Bangladesh*

**Akira Yamanaka**

*Department of Physics,  
Biology & Informatics,  
Faculty of Science;  
Yamaguchi University;  
Yamaguchi, 753-8512, Japan*

**Correspondence:**

**A.T.M.F. Islam**

*Institute of Food &  
Radiation Biology, Atomic  
Energy Research  
Establishment, G.P.O.Box-  
3787, Dhaka-1000,  
Bangladesh.*

**Email:**

[islamf1968@yahoo.com](mailto:islamf1968@yahoo.com)

**Tel:** 880-2-7788246

## A preliminary report of moth's fauna in the campus of Atomic Energy Research Establishment (AERE), Savar, Dhaka, Bangladesh

**A.T.M.F. Islam, M.H. Islam, A.S.M. Saifullah, Akira Yamanaka**

### ABSTRACT

A preliminary study of moth's fauna was carried out during May-October, 2011 in the campus of Atomic Energy Research Establishment (AERE), Savar, Dhaka. Moths were collected by using a light trap for one hour following the sunset. A total of 153 moth species belonging to 113 genera, 25 sub-families under 14 families were recorded. The recorded moth families were Noctuidae, Pyralidae, Arctiidae, Geometridae, Sphingidae, Lymantriidae, Ctenuchidae, Lymacodidae, Drepanidae, Psychidae, Nolidae, Notodontidae, Lasiocampidae and Hypsiidae. The most dominant moth families in the AERE campus were Pyralidae, Noctuidae and Arctiidae their relative abundance was 45.86, 31.09 and 13.90, respectively. Whereas, Psychidae, Nolidae and Lasiocampidae were found to be minor family and relative abundance to those families was <0.07. Among the collected specimens *Cnaphalocrocis medinalis* (Pyralidae) was found to be the most dominant species in AERE campus and their relative abundance was 26.68.

**Keywords:** Preliminary, study, moths, campus, AERE.

### 1. Introduction

Lepidoptera is one of the large order of insects that include butterflies and moths. Butterfly and moths was demonstrated to be one of suitable animal groups as an indicator of ecological studies, because of their population abundance, species richness and apparent responsiveness to the changes of vegetation's and climates [1]. Butterfly group consisting of over 28,000 species in the world [2]. However, moth group consisting of over 1,27,000 species in the world [3] and exhibit far higher diversities in species and population sizes as compared to those of butterflies. Because of their nocturnal habits, moths are among the least known creature in the insect world. The moth group may be one of the suitable animal groups to bring us useful information and smashing evolutionary successes in field studies of ecological conditions [4, 5-8]. Reported 5618 moth species in the Fauna of British India including Ceylon and Burma. Recently in India over 12000 species moth have been reported [9]. In Japan, numbers of moth species were shown to reach over 4,400 which are far larger as compared to over 300 species of butterflies [10-11]. Several reports have been published on the fauna of butterfly, their species diversities and seasonal fluctuations of their population as well as appearance of their seasonal morphs in different areas at Savar, Dhaka, Bangladesh [12-17]; but so far no reports have been published on the faunal record of moths in the same study area.

In the present study, we attempted to collect moths using a light trap during May- October, 2011 in the campus of Atomic Energy Research Establishment (AERE), Savar, Dhaka, to identify moth species, analyze their diversities and abundance as well as the compositions of moth families.

### 3. Materials and Methods

This study was carried out during May-October, 2011 in AERE campus Savar which is situated at north-west suburbs of Dhaka. The area of AERE campus is about 115 ha, the vegetations of which vary depending on fields, forests and gardens, i. e. fields of fruit plants, timber plants, ornamental plants and grasses, flower gardens and ponds in addition to buildings of offices and resident apartments.

Natural vegetations including small forests were covered mainly with different types of herbs, shrubs and weeds. On fine days, moths were collected by using a light trap for an hour following the sunset. The light trap was consisted of a white cloth (1m X 3m) positioned perpendicular to the ground, and four 40-W white florescent lights and a 200-W mercury light were used as the light sources. Ground of the light trap was covered with a white cloth (1m X 3m). Moths attracted by the light trap was collected by using insect nets and killed with carbon tetrachloride in the bottle. Their wings were stretched on insect stretching boards and dried properly in a dry oven at 50 °C. Collected moths were identified according to moth specimen books, "Moths of Japan" [10] and "Moths of Thailand" [18]. Relative abundances of the moth species were calculated as described in Landau and Prowell [19].

#### 4. Results and Discussions

During the study period a total of 1489 moths were collected. Collected moths were identified which consists of 153 species belonging to 113 genera in 25 sub-families under 14 families (Table-1). Among the 25 sub-families 9 belong to Noctuidae, 6 to Pyralidae, 5 to Geometridae, 3 to Arctiidae and 2 to Sphingidae family. These sub-families were consist of Catocalinae, Acontiinae, Ophiderinae, Amphipyrae, Noctuinae, Hadeninae, Hypeninae, Herminiinae and Heliiothinae under Noctuidae family; Pyraustinae, Schoenobiinae, Crambinae, Nymphulinae, Pyralinae and

Phycitiinae under Pyralidae family; Geometrinae, Ennominae, Oenochrominae, Larentinae and Sterrhinae under Geometridae family; Arctiinae, Lithosiinae and Nyctemerinae under Arctiidae family and Sphinginae, Macroglossinae under Sphingidae family (Table-1).

Among the collected 1489 moths 683 belong to the family Pyralidae, followed by Noctuidae (470), Arctiidae (207), Geometridae (41), Lymantridae (33), Hypsidae (18), Lymacodidae (17), Ctenuchidae (8), Drepanidae (7), Sphingidae (5), Notodontidae (4) Psychidae (1), Nolidae (1) and Lasiocampidae (1). The highest 58 species of moth was recorded from the family of Noctuidae followed by 44 species of Pyralidae, 16 species of Geometridae, 13 species of Arctiidae, 6 species of Lymantridae, 4 species of Sphingidae, 3 species of Ctenuchidae, 2 species of Lymacodidae, 2 species of Hypsidae and only 1 species recorded in each family of Drepanidae, Psychidae, Nolidae, Notodontidae and Lasiocampidae (Fig. 1). The above mentioned results have shown that the largest and the 2nd largest numbers of moths were recorded from the family of Pyralidae (683) and Noctuidae (470) in contrast the largest and the 2nd largest numbers of species belongs to Noctuidae (58) and Pyralidae (44). Considering these results the family Noctuidae showed highest species diversity among the recorded families in the study area.

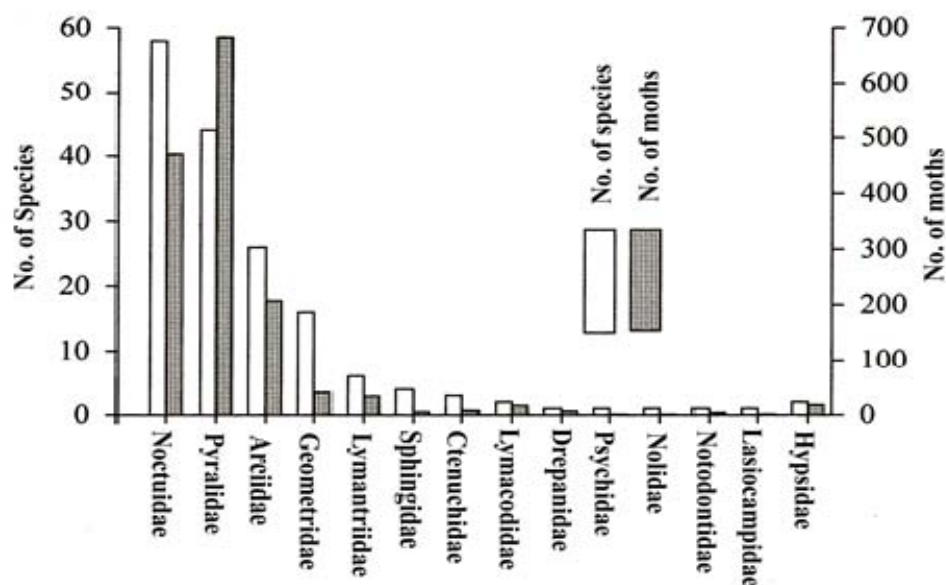


Fig 1: Numbers of moths and species of each family collected using by a light trap in the AERE campus

Among the moth families three families were dominant viz, Pyralidae, Noctuidae and Arctiidae. The relative abundance to these families was 45.89 for Pyralidae, 31.17 for Noctuidae and 13.92 for Arctiidae respectively. The relative abundance was found about 0.07 for Psychidae, Nolidae and Lasiocampidae (Table 1). Many minor species of moths was captured in the study area. Among the 153 identified moth species, 72 species was considered as minor since only 1 individual was captured per species. Similarly 16 species were recorded in which 2 to 3 individuals were captured per species. Dominant species was considered when more than 50 individuals were recorded per species. Accordingly four dominant species was found in study area, those were 62 individuals of *Spodoptera litura* (Noctuidae), 89 individuals of *Leucania compta* (Noctuidae), 397 individuals of

*Cnaphalocrocis medinalis* (Pyralidae) and 127 individuals of *Spilosoma obliqua* (Arctiidae) (Table 1&2). Results indicating that the *C. medinalis* was most dominant species in the study area, it may contribute largely to the dominance of Pyralidae family in study area. The dominance of *C. medinalis* in the study area might be due to the abundant larval food plants grown in grass fields of the AERE campus. A similar observation was reported in a moth species, *Crambus humidellu* (Crambidae) which was the most dominant moth species in Akiyoshi-dai plateau, Yamaguchi, Japan where abundant larval food plants grown in grasslands of Akiyoshi-dai plateau [20].

In the present study we have collected a good number of moths by using a light trap in the AERE campus and

succeeded to identify them up to species level. Since data of the present study are not sufficient to analyze species diversities and population sizes of moths, future studies will enrich the data for analyzing how species diversities and

population sizes of moths changes with the changes of environmental and vegetation conditions in and around the study area.

**Table 1:** A species list with relative abundance of moth's fauna captured at AERE campus

Name of families and sub-families	Name and number of species	Number of moths	Relative abundance
<b>Noctuidae</b>	<b>58 species</b>	<b>470</b>	<b>31.4</b>
<b>Catocalinae</b>	<b>15 species</b>	<b>77</b>	
	1. <i>Ophiusa coronate</i>	6	0.40
	2. <i>Pindara illibata</i>	1	0.07
	3. <i>Artena dotala</i>	2	0.13
	4. <i>Mocis undata</i>	12	0.81
	5. <i>Mocis</i> sp.	1	0.07
	6. <i>Parallelia mandschurica</i>	14	0.94
	7. <i>Parallelia arctotaemia</i>	1	0.07
	8. <i>Grammodes geometrica</i>	4	0.27
	9. <i>Chalciope mygdon</i>	3	0.20
	10. <i>Achae janata</i>	8	0.54
	11. <i>Remigia frugalis</i>	19	1.28
	12. <i>Spirama helicina</i>	1	0.07
	13. <i>Eupatula macrops</i>	1	0.07
	14. <i>Erebus hieroglyphica</i>	3	0.20
	15. <i>Hulodes drylla</i>	1	0.07
	<b>11 species</b>	<b>49</b>	
<b>Acontiinae</b>	16. <i>Xanthodes intersepta</i>	1	0.07
	17. <i>Acanthoplusia aganta</i>	15	1.01
	18. <i>Chrysodeixis acuta</i>	3	0.20
	19. <i>Chrysodeixis minutus</i>	1	0.07
	20. <i>Oruza divisa</i>	1	0.07
	21. <i>Oruza</i> sp.	1	0.07
	22. <i>Corgatha pygmaea</i>	1	0.07
	23. <i>Naranga aenescens</i>	17	1.14
	24. <i>Maliattha signifera</i>	7	0.47
	25. <i>Lithacidia elaeostygia</i>	1	0.07
	26. <i>Trichoplusia orichalcea</i>	1	0.07
	<b>8 species</b>	<b>22</b>	
<b>Ophiderinae</b>	27. <i>Othreis fullonia</i>	6	0.40
	28. <i>Pandytia metaspila</i>	3	0.20
	29. <i>Ericeia</i> sp.	1	0.07
	30. <i>Polydesma boarmoides</i>	4	0.27
	31. <i>Anticarsia irrorata</i>	1	0.07
	32. <i>Othreis homaena</i>	2	0.13
	33. <i>Anomis flava flava</i>	1	0.07
	34. <i>Anticarsia</i> sp.	4	0.27
	<b>12 species</b>	<b>165</b>	
<b>Amphipyriinae</b>	35. <i>Spodoptera litura</i>	62	4.17
	36. <i>Spodoptera mauritia aconyctoides</i>	13	0.87
	37. <i>Spodoptera depravata</i>	31	2.08
	38. <i>Spodoptera exigue</i>	4	0.27
	39. <i>Spodoptera cilium</i>	13	0.87
	40. <i>Platysenta illecta</i>	4	0.27
	41. <i>Athetis placida</i>	3	0.20
	42. <i>Athetis lapidea</i>	7	0.47
	43. <i>Athetis striolata</i>	3	0.20
	44. <i>Athetis furvula lentina</i>	5	0.34
	45. <i>Sesamia inferens</i>	12	0.81
	46. <i>Chasminodes japonica</i>	1	0.07
<b>Noctuinae</b>	<b>1 species</b>	<b>7</b>	
	47. <i>Anapamea minor</i>	7	0.47
<b>Hadeninae</b>	<b>2 species</b>	<b>28</b>	

	48. <i>Agrotis ipsilon</i>	27	1.81
	49. <i>Euxoa nigrata</i>	1	0.07
<b>Hypeninae</b>	<b>3 species</b>	<b>101</b>	
	50. <i>Leucania compta</i>	89	5.98
	51. <i>Leucania</i> sp.	7	0.47
	52. <i>Acantholeucania loreyimima</i>	5	0.34
<b>Hermiinae</b>	<b>2 species</b>	<b>6</b>	
	53. <i>Hypena indicatalis</i>	5	0.34
	54. <i>Hypena longipennis</i>	1	0.07
<b>Heliiothinae</b>	<b>4 species</b>	<b>15</b>	
	55. <i>Simplicia ryukyuensis</i>	1	0.07
	56. <i>Paracolax biquincta</i>	5	0.34
	57. <i>Helicoverpa armigera armigera</i>	8	0.54
	58. <i>Helicoverpa assulta assulta</i>	1	0.07
<b>Pyalidae</b>	<b>44 species</b>	<b>683</b>	<b>45.7</b>
<b>Pyraustinae</b>	<b>26 species</b>	<b>556</b>	
	1. <i>Aethaloessa calidalis</i>	1	0.07
	2. <i>Maruca testulalis</i>	4	0.27
	3. <i>Diaphania indica</i>	1	0.07
	4. <i>Omphisa anastomosalis</i>	1	0.07
	5. <i>Glyphodes formosanus</i>	9	0.61
	6. <i>Hymenia recurvalis</i>	17	1.14
	7. <i>Eurrhyarodes accessalis</i>	6	0.40
	8. <i>Paraponyx fluctuosalis</i>	17	1.14
	9. <i>Herpetogramma stultalis</i>	18	1.21
	10. <i>Herpetogramma licarsisalis</i>	4	0.27
	11. <i>Herpetogramma okamoto</i>	17	1.14
	12. <i>Herpetogramma phaeopteralis</i>	15	1.01
	13. <i>Cnaphaocrocis medinalis</i>	397	26.68
	14. <i>Hedylepta misera</i>	1	0.07
	15. <i>Botyodes asialis</i>	1	0.07
	16. <i>Ostrinia scapularis subpacifica</i>	6	0.40
	17. <i>Ostrinia orientalis orientalis</i>	1	0.07
	18. <i>Pygospila tyres</i>	19	1.28
	19. <i>Tyspanodes gracilis</i>	1	0.07
	20. <i>Udea testacea</i>	8	0.54
	21. <i>Pycnarmon cribrata</i>	5	0.34
	22. <i>Marasmia limbalis</i>	1	0.07
	23. <i>Piletocera sodalis</i>	1	0.07
	24. <i>Leucinodes orbonalis</i>	1	0.07
	25. <i>Goniorhynchus butyroza</i>	1	0.07
26. <i>Glyphodes pyloalis</i>	2	0.13	
<b>Schoenobiinae</b>	<b>8 species</b>	<b>80</b>	
	27. <i>Scirpophaga excerptalis</i>	12	0.81
	28. <i>Scirpophaga praelata</i>	1	0.07
	29. <i>Scirpophaga xantho</i>	1	0.07
	30. <i>Scirpophaga virginia</i>	4	0.27
	31. <i>Scirpophaga goto</i>	3	0.20
	32. <i>Scirpophaga nivella</i>	1	0.07
	33. <i>Scirpophaga incertulas</i>	42	2.82
	34. <i>Scirpophaga parvalis</i>	16	1.08
<b>Crambinae</b>	<b>5 species</b>	<b>6</b>	
	35. <i>Microchilo inouei</i>	1	0.07
	36. <i>Parapediasia teterrella</i>	1	0.07
	37. <i>Pareromene vermeeri</i>	2	0.13
	38. <i>Neopediasia mixtalis</i>	1	0.07
	39. <i>Calamotropha yamanakai owadai</i>	1	0.07
<b>Nymphulinae</b>	<b>2 species</b>	<b>38</b>	
	40. <i>Nymphula enixalis</i>	34	2.28
	41. <i>Paraponyx vittalis</i>	4	0.27
<b>Pyalinae</b>	<b>2 species</b>	<b>2</b>	

	42. <i>Hypsopygia kawabei</i>	1	0.07
	43. <i>Quasipuer infamella</i>	1	0.07
<b>Phycitinae</b>	<b>1 species</b>	<b>1</b>	
	44. <i>Homoeosoma matsumyrellum</i>	1	0.07
<b>Arctiidae</b>	<b>13 species</b>	<b>207</b>	<b>13.8</b>
<b>Arctiinae</b>	<b>9 species</b>	<b>190</b>	
	1. <i>Cretonotos gangis</i>	1	0.07
	2. <i>Cretonotos transiens diasetuzana</i>	19	1.28
	3. <i>Utetheisa pulchelloides</i>	17	1.14
	4. <i>Utetheisa lotrix lotrix</i>	6	0.40
	5. <i>Spilosoma obliqua</i>	127	8.53
	6. <i>Spilosoma seriatopunctata ozumai</i>	1	0.07
	7. <i>Spilosoma inaequalis sakasuchii</i>	4	0.27
	8. <i>Spilosoma inaequalis inaequalis</i>	1	0.07
	9. <i>Rhyparioides nebulosus</i>	14	0.94
<b>Lithosiinae</b>	<b>3 species</b>	<b>16</b>	
	10. <i>Eilema laevis</i>	1	0.07
	11. <i>Mitochrista</i> sp.	4	0.27
	12. <i>Stigmatophora bipuncta</i>	11	0.74
<b>Nyctemerinae</b>	<b>1 species</b>	<b>1</b>	
	13. <i>Nyctemer</i> sp.	1	0.07
<b>Geometridae</b>	<b>16 species</b>	<b>41</b>	<b>2.7</b>
<b>Geometrinae</b>	<b>8 species</b>	<b>10</b>	
	1. <i>Comibaena diluta</i>	1	0.07
	2. <i>Comibaena amoenaria</i>	1	0.07
	3. <i>Thalassodes subquadrodoris</i>	2	0.13
	4. <i>Thalassodes proquadraria</i>	1	0.07
	5. <i>Thalassodes inmissaria inmissaria</i>	1	0.07
	6. <i>Pamphlebia rubrolimbraria</i>	1	0.07
	7. <i>Chlorissa anadema</i>	1	0.07
	8. <i>Comostola subtiliaria kawazoei</i>	2	0.13
<b>Ennominae</b>	<b>2 species</b>	<b>25</b>	
	9. <i>Hyposidra talaca</i>	22	1.48
	10. <i>Heterolocha aristonaria</i>	3	0.20
<b>Oenochrominae</b>	<b>2 species</b>	<b>2</b>	
	11. <i>Eumelea biflavata insulate</i>	1	0.07
	12. <i>Derambila saponaria fragilis</i>	1	0.07
<b>Larentinae</b>	<b>1 species</b>	<b>1</b>	
	1. <i>Gymnoscelis ishigakinsis</i>	1	0.07
<b>Sterrhinae</b>	<b>3 species</b>	<b>3</b>	
	1. <i>Scopula superciliata</i>	1	0.07
	2. <i>Scopula subpunctata</i>	1	0.07
	3. <i>Idaea neovalida</i>	1	0.07
<b>Lymantriidae</b>	<b>6 species</b>	<b>33</b>	<b>2.2</b>
	1. <i>Parocneria furva</i>	1	0.07
	2. <i>Euproctis pulvereana</i>	1	0.07
	3. <i>Arctornis album</i>	1	0.07
	4. <i>Calliteara</i> sp.	7	0.47
	5. <i>Euproctis</i> sp1.	22	1.48
	6. <i>Euproctis</i> sp2.	1	0.07
<b>Sphingidae</b>	<b>4 species</b>	<b>5</b>	<b>0.3</b>
<b>Sphinginae</b>	<b>1 species</b>	<b>1</b>	
	1. <i>Agrius convolvuli</i>	1	0.07
<b>Macroglossinae</b>	<b>3 species</b>	<b>4</b>	
	2. <i>Thereta clotho clotho</i>	1	0.07
	3. <i>Thereta pinastrina pinastrina</i>	2	0.13
	4. <i>Rhyncholaba acteus</i>	1	0.07
<b>Ctenuchidae</b>	<b>3 species</b>	<b>8</b>	<b>0.54</b>
	1. <i>Amata</i> sp.	1	0.07
	2. <i>Amata</i> sp.	5	0.34
	3. <i>Amata</i> sp.	2	0.13

<b>Lymacodidae</b>	<b>2 species</b>	<b>17</b>	<b>1.14</b>
	1. <i>Latoia sinica</i>	1	0.07
	2. <i>Susica fusca</i>	16	1.07
<b>Drepanidae</b>	<b>1 species</b>	<b>7</b>	<b>0.47</b>
	1. <i>Agnidra scabiosa scabiosa</i>	7	
<b>Psychidae</b>	<b>1 species</b>	<b>1</b>	<b>0.07</b>
	1. <i>Bambalina</i> sp.	1	
<b>Nolidae</b>	<b>1 species</b>	<b>1</b>	<b>0.07</b>
	1. <i>Meganola pseudohypena</i>	1	
<b>Notodontidae</b>	<b>1 species</b>	<b>4</b>	<b>0.27</b>
	1. <i>Zaranga permagna</i>	4	
<b>Lasiocampidae</b>	<b>1 species</b>	<b>1</b>	<b>0.07</b>
	1. <i>Odonestis pruni japonensis</i>	1	
<b>Hypsidae</b>	<b>2 species</b>	<b>18</b>	<b>1.21</b>
	1. <i>Asota caricae</i>	15	1.01
	2. <i>Asota paphos</i>	3	0.20

**Table 2:** Species abundance of moths captured in the AERE campus from May to October, 2011

Number of moths captured per species	Number of species
1	72
2-3	16
4-7	30
8-15	14
16-31	15
32-50	2
50-127	3
>127	1

## 5. Acknowledgements

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