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A hasty survey on diversity of moths (lepidoptera : heterocera) from Ahmednagar college campus, Ahmednagar (Maharashtra) India

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ABSTRACT

A hasty survey to assess diversity of moths has been conducted at Ahmednagar College campus. A total of 34 species of moths belonging to 07 families and 15 subfamilies have been presented in this report. Of the total specimens, 26 moths were identified at specific level and remaining were given morpho-species label. Family Erebidae and Geometridae dominated in the study area, followed by Sphingidae, Noctuidae, Crambidae, Eupterotidae, and minimum number of species were noted from family Notodontidae. The present work is a minor investigation, but it may serve to contribute to the database for generating larger regional inventory on moth diversity.

Figure : 01 (Plates 1-3) References : 22 Table : 01
KEY WORDS : Ahmednagar College, Diversity, Lepidoptera, Maharashtra, Moths,

Introduction

The term 'biodiversity' encompasses different ecosystems, species, genes and their relative abundance[17]. It is commonly used to describe number, variety and variability of living organisms[20]. An inventory of biodiversity is of primary importance as a part of biodiversity conservation for sustainable development, particularly in tropical and subtropical regions that harbour such great number of species[7]. Insects make an enormous contribution to tropical diversity[15], as they comprise more than half of the world's known animal species[22]. Moreover, arthropod inventories can serve as good indicators of habitat biodiversity because arthropods respond quickly to environmental changes[16].

Order Lepidoptera is the second largest insect order[2] of holometabolous, endopterygotes, scaly winged insects, which include butterflies and moths[18]. Most of the lepidopterans are moths with approximately 1,60,000 species worldwide[1]. Moths are cosmopolitan in distribution occurring in every conceivable habitat front plains to deserts, forests and valleys of hills and mountains[7]. The diversity and distribution of moth fauna may reflect the status of the ecosystem in which they live[19]. Thus, abundance or absence of moths reflects the biodiversity of vegetation of the area being sampled[3].

The year 2020 marks the end of the 'United Nations Decade on Biodiversity', which was declared for the promotion of biodiversity conservation; and one preliminary aspect of this activity is biodiversity monitoring. There have been mammoth efforts world-over in this regard but little efforts at regional and local levels also matter a lot, especially when they focus on a specific group of fauna. Thus, a need was felt to monitor the diversity of moths from an urbanised green patch like Ahmednagar College campus, which is human-dominated landscape with fragmented habitats. The College campus is spread over 52 acres, and is located in the heart of the Ahmednagar City. The objectives of the study were to record the moth species so as to prepare a preliminary checklist and to find out dominant and rare taxa.

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Table-1: Preliminary list of moth species recorded from Ahmednagar College Campus

Sr. No.	Scientific Name	Family	Subfamily
1.	*Diaphania indica*	Crambidae	Pyraustinae
2.	*Meroctena* sp.	Crambidae	Spilomelinae
3.	*Eupterote undata*	Eupterotidae	
4.	*Daphnis nerii*	Sphingidae	Macroglossinae
5.	*Hippotion celerio*	Sphingidae	Macroglossinae
6.	*Nephele hispera*	Sphingidae	Macroglossinae
7.	*Acherontia styx*	Sphingidae	Sphinginae
8.	*Agrius convolvuli*	Sphingidae	Sphinginae
9.	*Biston suppressaria*	Geometridae	Ennominae
10.	*Chiasmia eleonora*	Geometridae	Ennominae
11.	*Cleora* sp.	Geometridae	Ennominae
12.	*Isturgia bolina*	Geometridae	Ennominae
13.	*Isturgia* sp.	Geometridae	Ennominae
14.	*Chlorocoma* sp.	Geometridae	Geometrinae
15.	*Scopula addictaria*	Geometridae	Sterrhinae
16.	*Scopula* sp.	Geometridae	Sterrhinae
17.	*Phalera grotei*	Notodontidae	
18.	*Asota ficus*	Erebidae	Aganainae
19.	*Amata passalis*	Erebidae	Arctiinae
20.	*Olepa ricini*	Erebidae	Arctiinae
21.	*Eudocima homaena*	Erebidae	Calpinae
22.	*Eudocima phalonia*	Erebidae	Calpinae

Sr. No.	Scientific Name	Family	Subfamily
23.	*Acantholipes trajecta*	Erebidae	Erebinae
24.	*Achaea janata*	Erebidae	Erebinae
25.	*Bastilla torrida*	Erebidae	Erebinae
26.	*Spirama retorta*	Erebidae	Erebinae
27.	*Erebus hieroglyphica*	Erebidae	Erebinae
28.	*Olene mendosa*	Erebidae	Lymantriinae
29.	*Ischyja manlia*	Erebidae	*Incertae sedis*
30.	*Agrotis* sp.	Noctuidae	Noctuinae
31.	*Chrysodeixis acuta*	Noctuidae	Plusiinae
32.	*Spodoptera litura*	Noctuidae	Xyleninae
33.	*Spodoptera* sp.	Noctuidae	Xyleninae
34.	Unknown species	Noctuidae	-

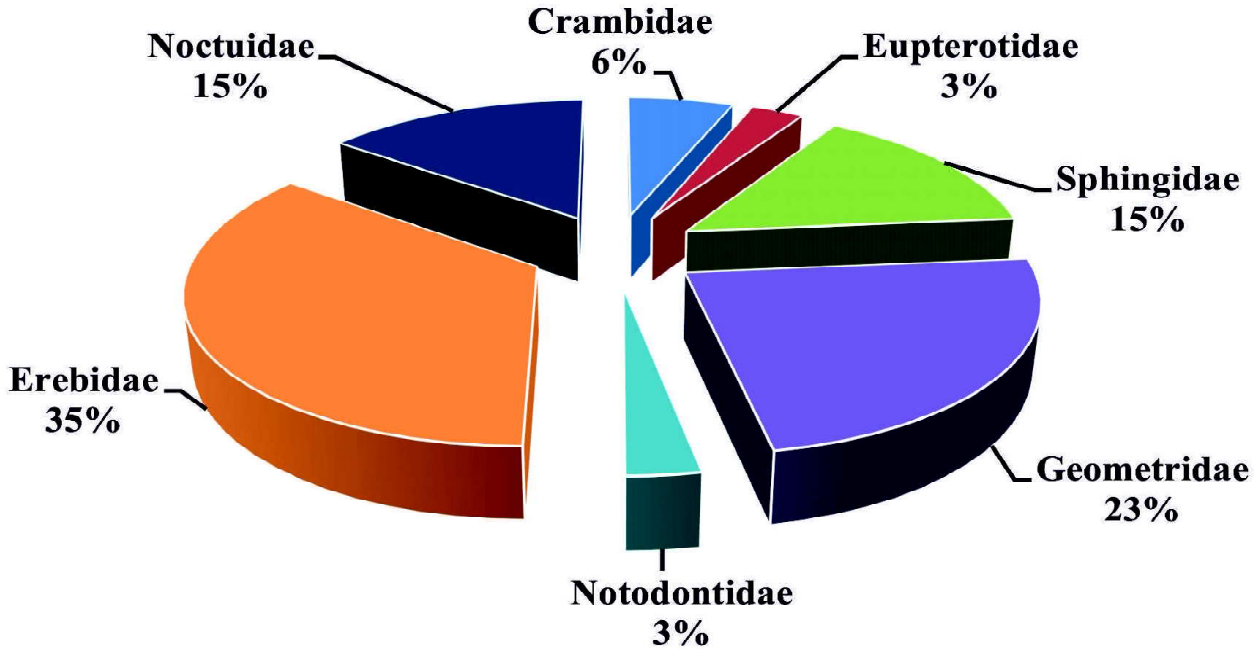


Fig. 1: Family-wise Distribution of Moth Species

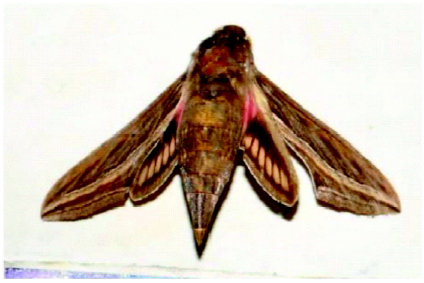
Plate 1. Lepidopteran insects belonging to the families Crambidae, Eupterotidae, Sphingidae, Geometridae

1. *Diaphania indica*

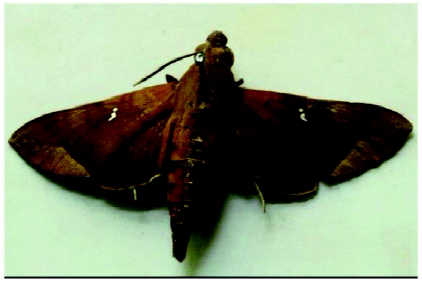
2. *Meroctena* sp.

3. *Eupterote undata*

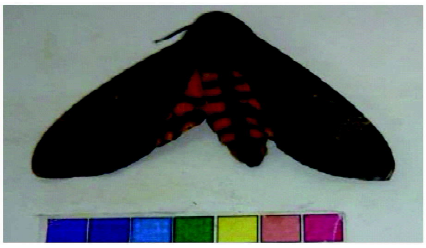
4. *Daphnis nerii*



5. *Hippotion celerio*

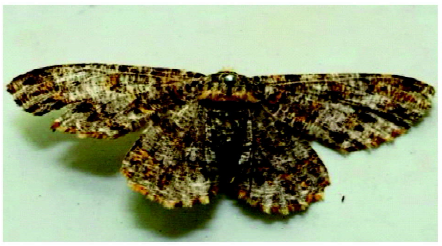


6. *Nephele hispera*

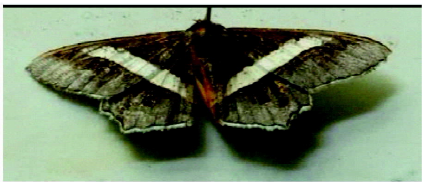


7. *Acherontia styx*

8. *Agrius convolvuli*



9. *Biston suppressaria*



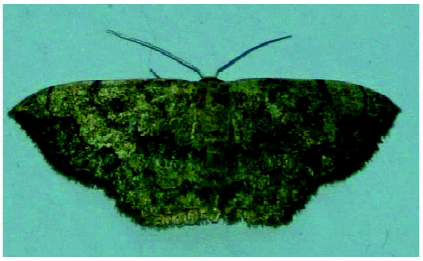
10. *Chiasmia eleonora*

11. *Cleora* sp.

12. *Isturgia bolina*

13. *Isturgia* sp.

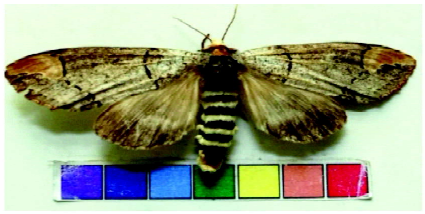
14. *Chlorocoma* sp.



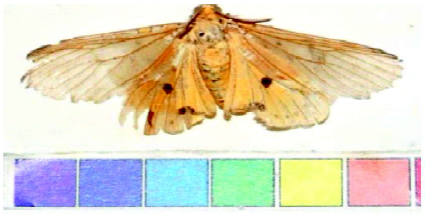
15. *Scopula addictaria*

Plate 2 : Lepidopteran insects belonging to the families Geometridae, Notodontidae, Erebidae, Noctuidae

16. *Scopula* sp.



17. *Phalera grotei*

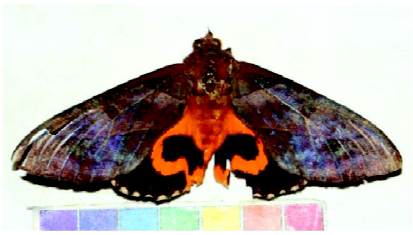


18. *Asota ficus*

19. Amata passalis

20. *Olepa ricini*

21. *Eudocima homaena*

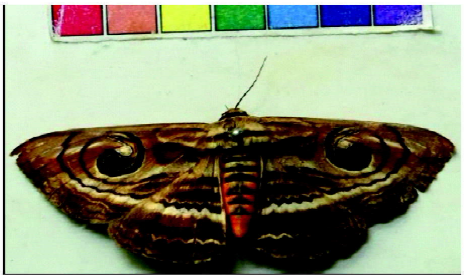


22. *Eudocima phalonia*

23. *Acantholipes trajecta*

24. *Achaea janata*

25. *Bastilla torrida*

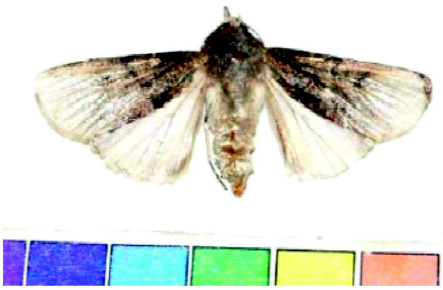


26. *Spirama retorta*

27. *Erebus hieroglyphica*

28. *Olene mendosa*

29. *Ischyja manlia*

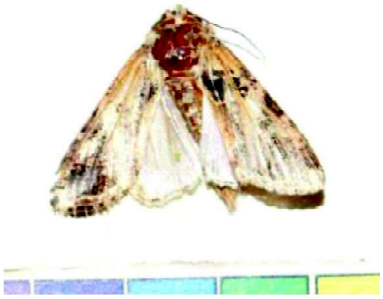


30. *Agrotis* sp.

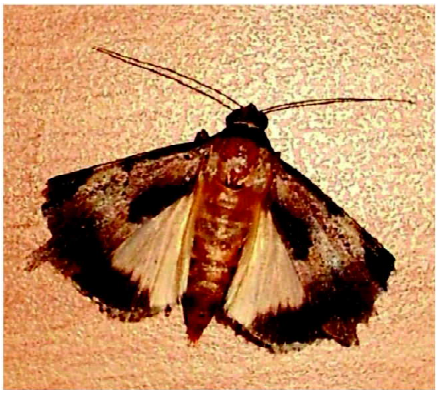
Plate 3 : Lepidopteran insects belonging to the family Noctuidae

31. *Chrysodeixis acuta*

32. *Spodoptera litura*



33. *Spodoptera* sp.



34. Noctuidae sp.

Material and Methods

Moths were collected from various study sites within the campus on thick vegetation, shrubs, grasses, playgrounds, open spaces, college buildings and residential areas. The moth specimens were collected by thorough observation on field by hand picking. Most sampling was carried out mainly during late hours after sunset (18.30 to 23.00 hrs.) and just before sunrise (5.00 to 6.00 hrs.). Light traps were employed to attract moth species during night, while some moth species were recorded during daytime.

Collected moth specimens were pinned using entomological pins and spread using spreading board and dried in oven at about 55-60°C for 24-36 hours. Preserved specimens were labelled and stored in insect boxes. The preserved specimens of moth were identified with reference to the relevant literature[5-9, 10-14]. The order of the superfamilies and families (Table-1 and Plates 1,2) is based on previous work[21]. The subfamilies, genera and species are listed alphabetically within their respective families.

Results and Discussion

A preliminary list of moth species recorded from Ahmednagar College campus has been presented in Table 1 and Plates 1–3**.** A total 34 species of moths belonging to 07 families and 15 subfamilies have been presented in this report. Of the 34 species, 26 moths were identified at specific level and remaining were given morpho-species label. Total 07 families were recorded in the present study *viz.,* Crambidae, Eupterotidae, Sphingidae, Geometridae, Notodontidae, Erebidae, and Noctuidae. Of these, maximum number of species belonged to family Erebidae (12 species) and other families included Geometridae (08 species), Sphingidae (05 species), Noctuidae (05 species), Crambidae (02 species) and single species recorded from families Eupterotidae and Notodontidae each. Family-wise species distribution is depicted (Fig.-1).

The present study is a rapid survey which resulted in the preparation of a preliminary checklist of moths from Ahmednagar College campus. The study area is an urbanised space with scattered patches of moderately thick vegetation, grasses, shrubs, trees, and open space. It shows a moderate diversity of moths in its various habitats. The present work does not claim to have recorded the entire moth assemblage from the study area, as extensive surveys are needed to get better idea of moth diversity therein. There is a large scope for further studies on biodiversity assessment of moths from the study area considering the possibility of much more species diversity of moths.

Workers[5-9] reported 405 moth species from North Maharashtra representing a checklist of moths from Maharashtra. They got significant results in terms of number of species due to extensive survey and use of all possible scientific methods to attract and record moth species. Their results also reveal the dominance of family

Erebidae species which are indicators of assemblages showing mixed vegetation of agriculture and forest species. A study by workers[4] revealed a total of 41 species from 12 families identified from in and around Amravati city of which, the members of the family Erebidae outnumbered the other moth families like Noctuidae, Crambidae, Arctiidae, Sphingidae, Lasiocampidae, Lymantridae, Saturniidae, Nolidae and Uranidae. Similar dominance of family Erebidae was also found in the present study, although further detailed survey will be necessary to explore exact species composition and diversity of moths.

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