Abundance of some moths in Hinthada University Campus

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Abstract

The present study deals with some mothsspecies in Hinthada University from March 2017 to April 2019. The species were taken of coloured photographs. During period of the study, a total number of 26 species of moths belonging to 21 genera and four families have been collected from Hinthada University Campus. Diagnostic characters of moth species have been given. The number of species the *Sphingidae* were abundant in this enviroment.

Keywords: moths, abundance, Hinthada University campu

Introduction

Arthropoda, including insects, comprises approximately two-thirds of the known organisms in the world. They are suitable for indicator organisms because they are both abundant and diverse, and different species are adapted for different environmental conditions (Samways, 2005). Lepidoptera is the most familiar insects which is divided into two groups: the macrolepidoptera (large moths and butterflies) and the microlepidoptera, (small moths) (Robinson and Shaffer, 1994). Lepidoptera is the second largest order of insects to Coleoptera (beetles). It is estimated to have 10,000 species in North America (Mitchell and Herbet, 1987).

The moths and butterflies are one of the mega-diversity groups with more than 120,000 species worldwide. Moth and butterflies are noteworthy for their wings, which show vivid colors and a multiplicity of forms and provide advantages in identification. They also serve as major herbivores linking primary producers and consumers in ecosystem Scoble (1992).

Moths and butterflies are well-suited for indicators of habitat change and environmental gradients on many scales, including geographic scales across and within islands and temporal scales across seasons and years (Miller, 1997 and Dennis et *al.*, 2008). Butterflies and moths offer good opportunities for studies on population and community ecology (Pollard, 1991). Moths and butterflies have been widely used in ecological and conservation research worldwide (Kitching *et al.*, 2000, Summerville *et al.*, 2001 and Summerville and Crist, 2002).

Species diversity is important for the conservation of endangered species. To save the species from extinction, it is needed to maintain high species diversity. According to food chain and food web-mechanisms, diversity of an ecosystem may be influenced by the interactions between the populations of different species which are present in the ecosystem. No species can exist alone and they need another for their persistence; a high diversity at one tropic level, increasing the diversity of another. In general, the activities of people in urbanization and agriculture decrease diversity because of activities which decreases the physical variability of the environment and favour the specific species manipulation the population to increase productivity and so forth (Botkin and Keller, 1982).

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Material and Methods

Study site and study period

Hinthada University Campus is located between 17° 38´37" N and 95° 26´38" (Fig. 1). The total area is 0.37kmsq and situated at the northern part of Hinthada Township. Study period lasted from March 2016 to July 2018.

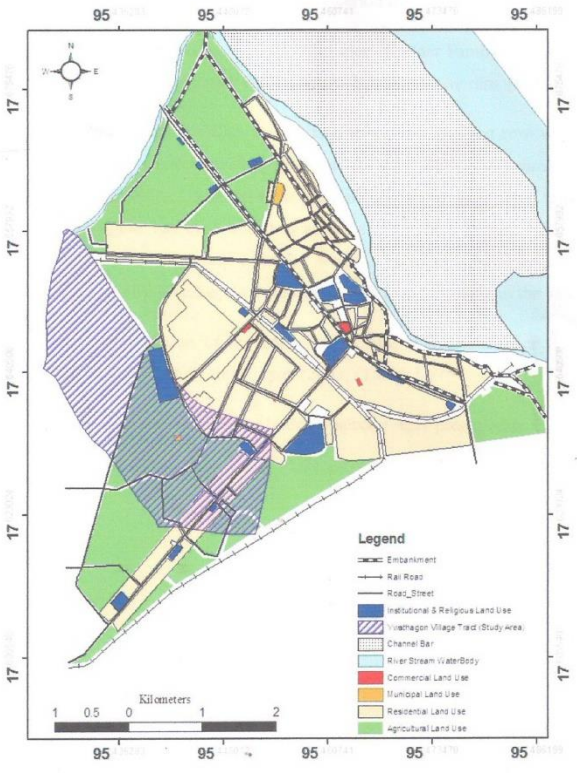


Figure (1). Location map of studied sites

Collection of the data

Moths are nocturnal and they are collected at night, during three periods: Summer (from February to May), Rainy (from June to September) and Winter (from October to January). The specimens can be found around the electric lamps, walls of the lighted building, ceilings and other lighted places. The collected materials are an insect collection hand net, a collection jar and a killing bottle contained some cotton soaked with a few drops of chloroform.

Identification of fish species

The collected specimens were identified and classified according to Hampson (1892, 1894 and 1895); Bell and Scott (1937) and Barlow (1982). The confirmed specimens were then recorded in coloured photographs for further study.

Preservation

After catching the moths, date, location, time, species, numbers of individuals and weather condition were recorded. As soon as the moths were caught, they were killed in the killing bottle with a few drops of chloroform. The moths were removed from the killing bottle and displayed on a spreading board by inserting insect pin into the middle of the thorax from the dorsal part of the body and spreading the wings of the moth. After 24 hours, the

fixed moths were transferred to the insect collection box. The insect boxes were applied with creosote and naphthalene balls to prevent fungus infection.

Results

Moth specimens collected from Hinthada University Campus comprises 26 species 21genera and four families under order- Lepidoptera were recorded during the study period from March 2016 to July 2018.

Recorded moth species under different families and percentage of moth species were shown in figure (2). According to the following graph, species under family- Sphingidae was found abundant and the species under family- Saturniidae rare.

In family Saturniidae, *Attacus atlas* and *Saturnia anna* were in June, Julyand August 2016.In family Arctiidae, the tiger moths*Angnia orbicularis*,*Nyctemera plagrifera*, *Creatonotus lactineus* and*Macrobrochis gigas*werefound frequently in August, September and October 2017. Daphnis nerii, *D.andamanus*,*Theretra clotho* ,*T. oldenlandiae, T. pinastrina* and *T. nessus* belong to family- Sphingidae were found frequently in July, August, September and November.

The recorded moth species during this investigation period was presented in table (1) and figure (2).

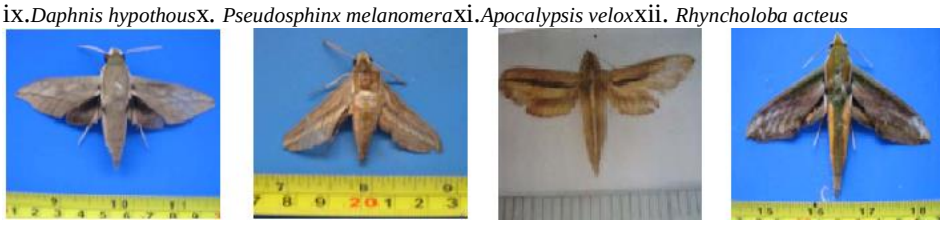
Table (1). Recorded moth species in Hinthada University campus

No	Scientific name	Common Name	Family	Order
1	*Attacus atlas*	Royal moth or Atlas moth	Saturniidae	Lepidoptera
2	*Saturniaanna*	Emperor moth		
3	*Acherontiastyxstyx*	Death's– head Hawk moth	Sphingidae	
4	*Herse convolvuli convolvuli*	Sweet potato moth		
5	*Psilogrammamenephron*	Hawk moth		
6	*Clanisphalaris*	Hawk moth		
7	*Daphnis nerii*	Hawk moth		
8	*Daphnis andamanus*	Hawk moth		
9	*Daphnis hypothous*	Hawk moth		
10	*Pseudosphinxmelanomera*	Sphinx moth		
11	*Apocalypsisvelox*	Hawk moth		
12	*Rhyncholobaacteus*	Hawk moth		
13	*Theretraclotho*	Hawk moth		
14	*Theretraoldenlandiaeoldenlandiae*	Hawk moth		
15	*Theretrapinastrina*	Hawk moth		
16	*Theretranessus*	Hawk moth		
17	*Angnia orbicularis*	Tiger and Footman moth	Arctiidae	
18	*Nyctemeraplagrifera*	Tiger and Footman moth		
19	*Asotaproducta*	Tiger and Footman moth		
20	*Phissamatransiens*	Tiger and Footman moth		
21	*Creatonotuslactineus*	Tiger and Footman moth		
22	*Macrobrochisgigas*	Tiger and Footman moth		
23	*Nyctipaomacrops*	Owlet moth	Noctuidae	
24	*Artenaindiscriminans*	Owlet moth		
25	*Ischyjaschlegelli*	Owlet moth		
26	*Othreismaterna*	Owlet moth		

i.*Attacus atlas* ii.*Saturnia anna* iii.*Acherontia styx styx* iv.*Herse convolvuli convolvuli*

v.*Psilogramma menephron*vi.*Clanis phalaris*vii.*Daphnis nerii*viii.*Daphnis andamanus*

ix.*Daphnis hypothous*x. *Pseudosphinx melanomera*xi.*Apocalypsis velox*xii. *Rhyncholoba acteus*



xiii.*Theretra clotho* xiv.*Theretraoldenlandiae* xv.*Theretra pinastrina*xvi.*Theretra nessus Oldenlandia*

xvii.*Angnia orbicularis*xviii.*Nyctemera plagrifera*xix.*Asota producta*xx.*Phissama transiens*

xxi.*Creatonotus lactineus*xxii.*Macrobrochis gigas*xxiii.*Nyctipao macrops*xxvi.*Nyctipao macrops*

xxv.*Ischyja schlegelli*xxvi.*Othreis materna*

Figure (2). Some recorded moth species of Family Sphingidae, Arctiidae and Noctuidae

Table(2) Recorded of moth species under different families

Sr.No	Family	No.of species	%
1	Saturniidae	2	8
4	Sphingidae	14	54
7	Arctiidae	6	23
8	Noctuidae	4	15
	Total	**26**	**100**

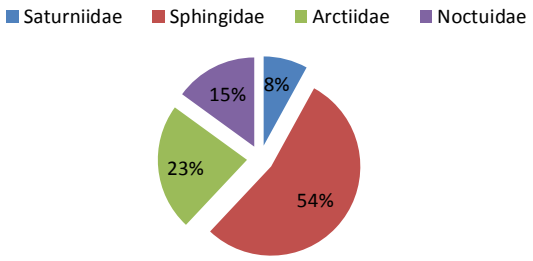


Figure (3). Percentage of moth species in the study area

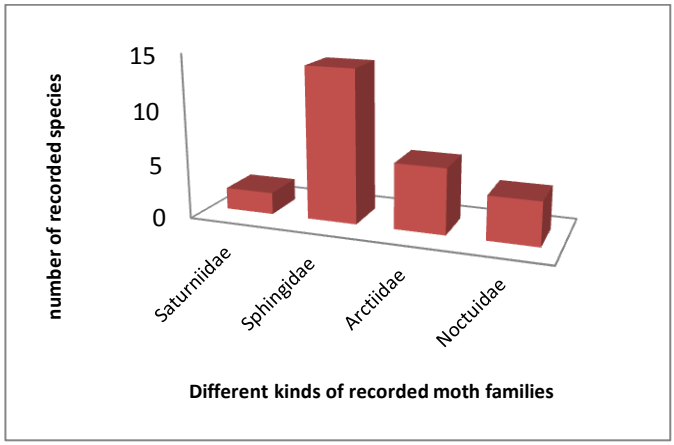


Figure (4). Recorded moth species under different families

Discussion and Conclusion

There are more than 120,000 species of butterflies and moths, representing a very conspicuous group of insects- Lepidoptera. They are found from the tropics to polar regions and in high mountains and deserts. Their excellent capacity for flight has enabled them to occupy all potential habitats. Because moths depend almost exclusively on plants for food and their existence is limited by conditions governing the life of plants. The brightest colours and the greatest diversity of species occur among tropical Lepidoptera (Novak, 1990).

In this research, 26 species, 21 genera and 4 families under order- Lepidoptera were recorded. Some moth species were described in colour photographs. The species richness was found under family- Sphingidae in the present study. Richards and Davies (1977) revealed that this family includes a large number of described species than any other group of Lepidoptrea. The mothspecies under family- Noctuidae are mostly median- sized and rather dull – coloured moths. Some of the larvae are leaf eaters, some are cut worms, some are army worms, stem borers and fruit borers and some adults are fruitpiercers. In present study, the species richness was highest in rainy season with heavy rain and this period coincides with foliating period of the host plants. In hot and cool seasons species. The cut worms are more or less abundant every year. Pathak (1977) mentioned that the caterpillars of the rice army worms occur as a pest of paddy seedling especially in seed beds. They suddenly appear in masses and move like an army destroying the crops from field to field. *Heliothis armigear* injurious to cotton bolls and the fruit of other economic plants. *Sesamia inferens* is one of the

major pests of rice and sugarcane. The larvae is born in the stem of the various crops, weakening the stem mechanically and reducing the crop yield.

In the present investigation, 14 species of family-Sphingidae were recorded. They are moderate-sized to very large moths. They are easily recognizable by the elongate forewings and their very oblique outer margin.They are strong fliers and fly with a very rapid wing beat.

In *Daphnis nerii*, the upperside of head and thorax as well as the median area of forewings are duller green and the broad costal portion is much shaded with olive-black at double line which bounds the green area distally. *Daphnis hypothous* is brown over-all with a pattern of dark brown and lighter brown resembling the camouflage pattern of world war II air craft. However, in *Theretra oldenlandiae*, *T. clotho, T. pinastrina* and *T.Nessus* forewings are brown with at least one dark line from apex to inner margin, hind wings are dusky or red.

In family-Arctiidae, 6 species of tiger moths are recorded in the present study. They are small to medium-sized moths. Moths of which are conspicuously and brightly spotted or banded.

In family-Saturniidae, only one species *Attacus atlas* was found during the study period. It is the largest moth among the collected specimens. It is conspicuously and brightly coloured. The wings have transparent eye spots. The larvae are leaf-eaters.

In the present study, 26 moth species were observed and known that their caterpillars are the pests of rice, maize sesamum, beans, grasses and various vegetations. Host plants are essential for the survival of the butterfly and moth species (Gullan and Cranston, 2000). It seem that these paddy fields were infected with the moth species and the infection maybe remarkably low. Therefore the insects that invade to the paddy fields need to be studied and recorded.

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