

## Occurrence and Species Composition of some Moths (Lepidoptera) from Monywa University Campus

Khin Than Nyo<sup>1</sup>, Thida San<sup>2</sup>, Yin Min Hlaing<sup>3</sup>

### Abstract

Moths are conspicuous insects that belong to the order Lepidoptera and suborder Ditrysia. They are regarded as one of the indicators of a healthy environment. The present study is the very first documentation on the moth species in Monywa University Campus. University exhibits an enormous diversity of habitats including bushes, and grassland having a large number of trees and shrubs. This study was carried out from October 2013 to February 2014. Moths were recorded during the late evenings and the early mornings. A total of 20 species belonging to 14 genera under five families were recorded. Moth species of five families were recorded: Uraniidae, Sphingidae, Geometridae, Arctiidae and Noctuidae. The highest species composition was found in family Noctuidae (40%) and the lowest in family Uraniidae and Geometridae (5%) each. The largest moth species recorded in this study was *Nyctipao macrops*, whereas the smallest moth was *Spilosoma multiguttata*. This study will contribute to the better understanding of moth in Monywa University Campus and can be used in environment friendly development programs.

**Keywords:** Moths, Lepidoptera, Ditrysia, indicators, environment

### Introduction

Insects comprise approximately two-thirds of known organisms in the world and are viewed a good indicators of ecosystem biodiversity because they are abundant, diverse and adapted to different environmental conditions (Samways, 1994).

Lepidoptera is one of the most diverse groups, representing 157,424 described species globally. According to the study, 127,000 species of moths have been reported globally, among which 12,000 species moths have been reported from India (Chandra and Nema, 2007).

Moths belong to order lepidoptera, characterized by drably colored scales on the body and predominantly nocturnal nature. They have four wings, six legs and a jointed body divided into three sections, head, thorax and abdomen. They are very sensitive to climate changes and vegetation alterations making them an important group for monitoring climate and habitat changes (Thomas, 2005).

The morphological structure of the adult moth resembles in many respects with that of the butterfly. Generally, in common they have soft parts of the body held inside a hard exoskeleton composed of a substance known as chitin. Moths, like butterflies, bees and other more popularly recognized pollinating insects, serve an essential role as pollinators for many flowering plants, including species that bees do not visit. Nocturnal moths fly from flower to flower to feed on nectar during the night much as their diurnal relatives do during the day (Gavin, 2000).

Moths are a group of insects belonging to the order Lepidoptera along with butterflies, which are very similar. Moths can be distinguished from butterfly by some morphological characteristics and behaviors. The shape of the antennae is the best way to distinguish moths from butterflies. Moths have simple thread-like or feathery antenna without a club. Butterflies have a thickened club or hook on the tip of the antenna, never feathery. Butterflies are primarily diurnal, flying in the daytime. Moths are mostly nocturnal, flying at night. One of the most obvious differences between butterflies and moths is their resting wing position. Moths rest with their wings open, whereas butterflies tend to rest with their wings upwards and close.

---

<sup>1</sup> Demonstrator, Department of Zoology, Sagaing University, Myanmar

<sup>2</sup> Associate Professor, Department of Zoology, Sagaing University, Myanmar

<sup>3</sup> Associate Professor, Department of Zoology, Sagaing University, Myanmar

Monywa University exhibits diversity of habitats including bushes and grassland having a large number of trees, shrubs, which are common host plant of moth species.

### Objectives

This study was conducted with the following objectives.

- to identify and record some moth species in Monywa University Campus
- to observe the characters of some moth species
- to investigate the species composition of moths

### Materials and Methods

#### Study Area

Study area which is Monywa University Campus is located between  $95^{\circ} 10' 10''$  and  $95^{\circ} 09' 50''$  Longitude E and between  $22^{\circ} 08' 40''$  and  $22^{\circ} 09' 54''$  Latitude N (Figure-1).

#### Study Periods

The study periods were conducted from October, 2013 to February, 2014.

#### Collection of Specimens

Collections were made twice a week at night and sometimes at day time. The data collection time was from 6:00 -8:00 am to 6:00-8:00 pm in the study area. A long-handled insect net was used to catch the specimens. Wide mounted glass bottle, insect pins, some cotton, chloroforms and a spreading board were also used. The size, shape and colour of the collecting was recorded.

#### Preservation of Specimens

The captured specimens were immediately anesthetized by placing them in wide mouth bottles with cotton chloroform. The anesthetized specimens were mounted into the insect spreading board using insect pins and kept for two days to dry.

#### Identification of Specimens

The moths were identified and classified with reference to the fauna of British India series Vol I – III (Hampson, 1892,1894, 1896) and Barlow (1982), Borror, Triplehorn and Johnson (1992).

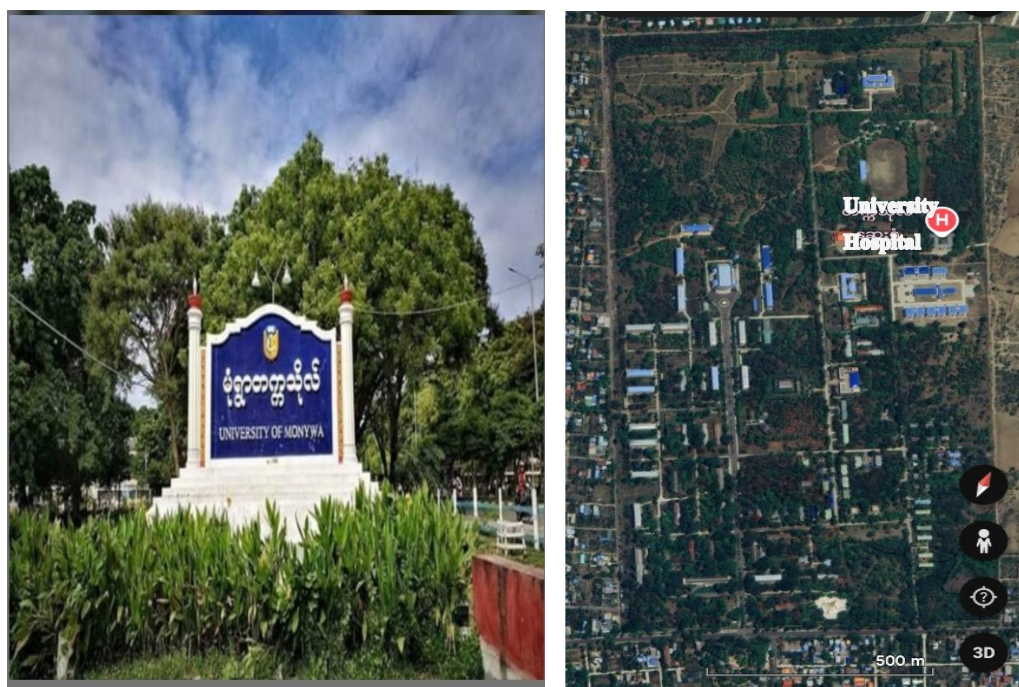


Figure 1. Location map of the Monywa University Campus, Monywa Township

### Result

In this research, a total of 20 species of moth belonging to 14 genera, five families and one order were recorded from Monywa University Campus during the study period. In case, family Uraniidae is one species, Sphingidae are seven species, Geometridae is one species, Arctiidae are three species and Noctuidae are eight species. These species were *Micronia aculeata*, *Nephele didyma*, *Daphnis hypothous*, *Hippotion Celerio*, *Theretra alecto*, *T. nessus*, *T. latreillei* and *T. lycetus*, *Semiothisa eleonora paranora*, *Spilosoma multiguttata*, *Nyctemera palgifera*, *Deiopeia pulchella*, *Nyctipao macrops*, *N. hieroglyphica*, *Oxyodes scrobiculata*, *Artena coranata*, *A. algira*, *A. arcuata*, *Sphingomorpha chlorea* and *Spirama retorta*. The highest family is Noctuidae and the lowest families are Uraniidae and Geometridae (Table 1) (Figure 2).

Table 1. List of some moth species in Monywa University Campus

Phylum	Class	Order	Family	Genus	Species	Common name
Arthropoda	Insecta	Lepidoptera	Uraniidae	<i>Micronia</i>	<i>Micronia aculeata</i>	Uraniid moth
			Sphingidae	<i>Nephele</i>	<i>Nephele didyma</i>	Hawk moth
				<i>Daphnis</i>	<i>Daphnis hypothous</i>	Hawk moth
				<i>Hippotion</i>	<i>Hippotion celerio</i>	Hawk moth
				<i>Theretra</i>	<i>Theretra alecto</i>	Hawk moth
				<i>Theretra nessus</i>	Hawk moth	
				<i>Theretra latreillei</i>	Hawk moth	
				<i>Theretra lycetus</i>	Hawk moth	
				Geometridae	<i>Semiothisa</i>	<i>Semiothisa eleonora paranora</i>
			Arctiidae	<i>Spilosoma</i>	<i>Spilosoma multiguttata</i>	Tiger moth
				<i>Nyctemera</i>	<i>Nyctemera plagifera</i>	Tiger moth
				<i>Deiopeia</i>	<i>Deiopeia pulchella</i>	White tiger moth
			Noctuidae	<i>Nyctipao</i>	<i>Nyctipao macrops</i>	Owlet moth
					<i>Nyctipao hieroglyphica</i>	Owlet moth
				<i>Oxyodes</i>	<i>Oxyodes scrobicualata</i>	Owlet moth
				<i>Artena</i>	<i>Artena coronata</i>	Owlet moth
					<i>Artena algira</i>	Owlet moth
					<i>Artena arcuata</i>	Owlet moth
				<i>Sphingomorpha</i>	<i>Sphingomorpha chlorea</i>	Owlet moth
			<i>Spirama</i>	<i>Spirama retorta</i>	Owlet moth	

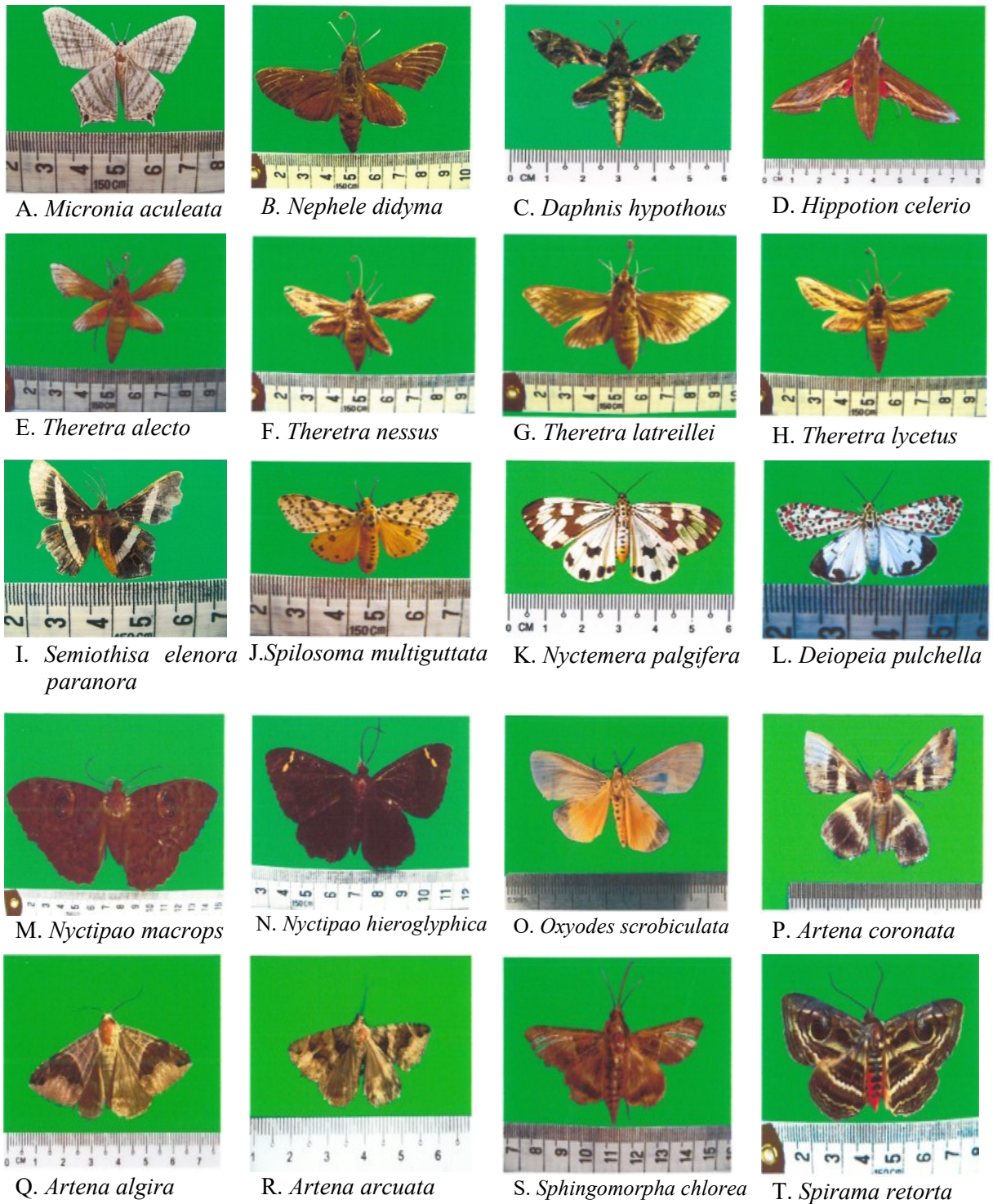


Figure 2. Studied species record in Monywa University Campus

Table 2. Percentage of species composition in different families from the study

Family	Number of species	Percentage (%)
Uraniidae	1	5%
Sphingidae	7	35%
Geometridae	1	5%
Arctiidae	3	15%
Noctuidae	8	40%
Total	20	100%

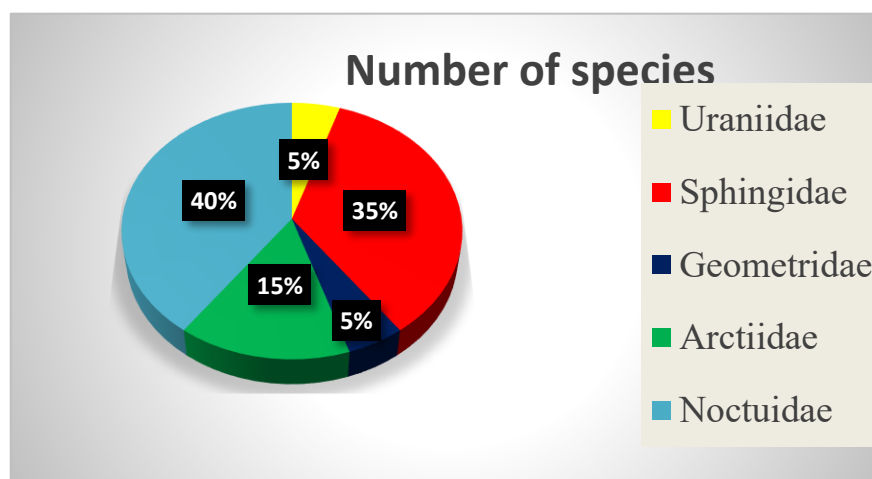


Figure 3. Percentage of species composition in different families from the study

### Discussion

A total of 20 species confined to 14 genera were recorded from Monywa University Campus during the study period. These moths belonged to five families of them 40% of the species were recorded from the family Noctuidae (eight species), Sphingidae (seven species), Arctiidae (three species), Uraniidae and Geometridae (one species each).

Family Noctuidae was the dominant group with eight species in the assemblage composition in which (*Nyctipao macrops*, *N. hieroglyphica*, *Oxyodes scrobiculata*, *Artena coranata*, *A. algira*, *A. arcuata*, *Sphingomorpha chlorea* and *Spirama retorta*) were recorded. Followed by Sphingidae in which (*Nephele didyma*, *Daphnis hypothous*, *Hippotion Celerio*, *Theretra alecto*, *T. nessus*, *T. latreillei* and *T. lycetus*) were found. Followed by family Arctiidae in which (*Spilosoma multiguttata*, *Nyctemera palgifera* and *Deiopeia pulchella*) were observed. Followed by family Uraniidae (*Micronia aculeata*) and Geometridae (*Semiothisa eleonora paranora*) were recorded.

The present study showed a total of 20 species belonging to five families recorded in the study area, under family Noctuidae (eight species). Kyaw Min Thu (2007) was recorded 37 species of moths including 11 species under family Noctuidae in National Kan Daw Gyi Gardens, Pyin Oo Lwin Township. The results, a little like with above author because of location and weather conditions are different.

From the present study, five families were recorded: Uraniidae, Sphingidae, Geometridae, Arctiidae and Noctuidae. Kyi Kyi Soe (2009) observed ten families, Saturniidae, Brahmaeidae, Lymantriidae, Eupterotidae, Sphingidae, Noctodontidae, Cossidae, Lasiocampidae, Arctiidae and Noctuidae in Kalay environs. The results, family Sphingidae, Arctiidae and Noctuidae are similar to the families of above author.

The present study, under family Uraniidae (one species), Sphingidae (seven species), Geometridae (one species), Arctiidae (three species), and Noctuidae (eight species).

Tabassum and Bisen (2012) reported, family Saturniidae (two species), Sphingidae (two species), Erebididae (14 species), Noctuidae (12 species), Notodontidae (one species), Geometridae (nine species), Lasiocampidae (two species), Tineidae (two species), Prodoxidae (one species), Petrophoridae (one species), Limacocidae (three species), Nolidae (one species), Crambidae (18 species) and pyralidae (one species). Therefore, the present study similar three families but different species finding above authors because of culturing and harvesting of the crop is different.

The present study, under family Uraniidae (5%), Sphingidae (35%), Geometridae (5%), Arctiidae (15%), and Noctuidae (40%) (Table-2 and Figure-2). Chandra *et al.*, (2012) stated that, family Noctuidae (40%), Sphingidae (80%), Crambidae(13%), Arctiidae(11%), Geometridae(5%), Notodontidae(5%), Saturniidae, Lymantriidae, Lasiocampidae and Uraniidae each present by (2%). Therefore, the present study similar five families but different percentage of species finding above authors because of differences other environmental conditions.

This research forms the most rudimental baseline for moth morphology and occurrence of species composition in Monywa University Campus.

### Conclusion

The study conducted in the Monywa University Campus has recorded 20 moth species belongs to five families. Among the recorded species, the species of *Nyctipao macrops* under family Noctuidae is the largest and the species of *Spilosoma multiguttata* under family Arctiidae is the smallest in size. Moths are regarded as one of the indicators of a healthy environment. Monywa University is a place with great biodiversity. University environment provides opportunities for the research students and this study may help to nourish emerging researchers.

### Acknowledgements

I would like to express my deep gratitude to Rector Dr. Soe Myint Aye, Pro-rector Dr. Phyu Phyu Myint, University of Sagaing for their encouragement to carry out this research paper. And then I would like to give my special thanks to Professor (Head) Dr. San San Win, Associate Professors Dr. Thida San and Dr. Yin Min Hlaing, all my teachers of Department of Zoology, Sagaing University, for their encouragement, guidance and reading of manuscript for the present work.

### References

- Barlow**, H.S., 1982. *An Introduction to the Moths of South East Asia* Printed in Kuala Lumpur, India. 305 pp.
- Borror**, D. J., Triplehorn C.A. and Johnson (1992) N.F. *An Introduction to the study of Insects*. 6<sup>th</sup> Edition. Saunders College Publishing New York.
- Chandra**, K. and Nema, D.K.,2007. *Insecta: Lepidoptera: Heterocera (Moths)*. In: *Director ZSI, India*. (Eds.), *fauna of Madhya Pradesh (including Chhattisgarh)*, *State Fauna series*, 15 (Part-1), Rec.Zool. Surv.India, PP 47-418.
- Chandra**. K., Sharma, R.M. and Sambath S. (2012) *A preliminary study on the Lepidoptera fauna of singhori wildlife Sanctuary, raisen district, Madhya Pradesh*.
- Gavin**, G.M., 2000. *Insects*. Dorling Kindersely Ltd., London. 158pp.
- Hampson**, G.F., 1892. *The Fauna of British India including Ceylon and Burma*, Vol.I, Red Lion Court, Fleet st. London.
- Hampson**, G.F., 1894. *The Fauna of British India including Ceylon and Burma*, Vol.II, Red Lion Court, Fleet st. London 608pp.
- Hampson**, G.F., 1895. *The Fauna of British India including Ceylon and Burma*, Vol.III, Red Lion Court, Fleet st. London 546pp.
- Kyaw Min Thu**, (2007). Taxonomic study on some moths in National Kan Daw Gyi Gardens, Pyin Oo Lwin Township. *MRes (Thesis)*. Department of Zoology, Mandalay University. 237 pp.
- Kyi Kyi Soe**, (2009). Species diversity and seasonal occurrence of some moths from Kalay environs. *PhD (Dissertation)*, University of Mandalay
- Samways**, M.J. (1994) *Insect Conservation biology*. Chapman and Hall, London, xv+358pp.
- Tabassum S.** and Bisen P. (2012). *A preliminary report on the biodiversity of moths (Insecta: Lepidoptera: Heterocera) of Balaghat city from southern Madhya Pradesh, India*
- Thomas**, 2005 J.A. *Thomas Monitoring change in the abundance and distribution of insects using butterflies and other indicator groups*, pp. 339 - 357