

**SPECIES DIVERSITY AND SEASONAL ABUNDANCES OF LIGHT  
ATTRACTED HAWKMOTHS (LEPIDOPTERA: SPHINGIDAE) IN  
DAKSHINKALI FOREST, PHARPING, KATHMANDU**



**A DISSERTATION  
SUBMITTED FOR THE PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR  
MASTERS DEGREE OF SCIENCE  
IN  
ZOOLOGY**

**BY  
MADAN KRISHNA SHRESTHA**

**Roll No. :- 1344**

**Batch No. :- 2059/060**

**T. U. Regd. :- 7977-95**

**TO  
Central Department of Zoology  
Institute of Science & Technology  
Tribhuvan University, Kirtipur,  
Kathmandu, Nepal**

**APRIL 2009**

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## DECLARATION

I here by declare that the dissertation entitled “**Species diversity and Seasonal abundances of light attracted hawkmoths (Lepidoptera: Sphingidae) in Dakshinkali forest, Pharping, Kathmandu**” submitted to Tribhuvan University, Faculty of science, Department of Zoology, under supervision of Prof. Dr. Anand Shova Tamrakar and co-supervision of Associate Prof. Bhaiya Khanal.

The following thesis has not been submitted to any University other than Tribhuvan University, Kirtipur, Nepal. The work presented here is that of the researcher.

Date: 2009 April

.....

Madan Krishna Shrestha

## RECOMMENDATION

It is my pleasure to mention that Mr. Madan Krishna Shrestha has completed his dissertation entitled “**Species diversity and Seasonal abundances of light attracted hawkmoths (Lepidoptera: Sphingidae) in Dakshinkali forest, Pharping, Kathmandu**” under our supervision and guidance.

We recommend that the dissertation be accepted for the partial fulfillment of the requirements of Degree of Master of Science in Zoology (Specialization: Entomology).

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## APPROVAL

On the recommendation of supervisor Prof. Dr. Anand Shova Tamrakar and co-supervisor Associate Prof. Bhaiya Khanal this dissertation, work of Mr. Madan Krishna Shrestha is approved for the Examination and submitted to the Trivhuban University in the partial fulfillment of the requirements for the Master's Degree of Science in Zoology (Specialization: Entomology)

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On the recommendation of supervisor Prof. Dr. Anand Shova Tamrakar and co-supervisor Associate Prof. Bhaiya Khanal, this dissertation work of Mr. Madan Krishna Shrestha entitled **“Species diversity and Seasonal abundances of light attracted hawk moths (Lepidoptera: Sphingidae) in Dakshinkali forest, Pharping, Kathmandu”** is approved for the examination and is submitted to Trivhuban University in partial fulfillment of the requirements for the Degree of Master of Science in Zoology (Specialization: Entomology).

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Madan Krishna Shrestha

## ABSTRACTS

A study of the hawkmoths (Lepidoptera: Sphingidae) was conducted in the Daksinkali forest area located in the southern portion of Kathmandu from May 2006 to October 2006. Hawkmoths were attracted using two 125-watt mercury-vapour bulbs. They were collected on a white cotton sheet affixed to the wall of a house with the lights suspended in front of it. Altogether, during the whole study period, a total of 117 specimens of hawkmoths representing 22 species within 15 genera were collected. The collected hawkmoths were classified into three subfamilies and 6 tribes. Smerinthinae was the most abundant and richest subfamily in study area, being followed by Macroglossinae, and Sphinginae. Among the tribes, the richest tribe was Macroglossini (8 species) followed by Ambulycini (5 species), Smerinthini (4 species), Sphingini and Acherontiini (2/2 species) and Sphingulini with only one species.

The peak month for hawkmoth collection was August with 29 individuals were captured; belonging to 15 species and the lowest record was in October with 10 individuals belonging to 4 species. The species diversity was determined in terms of Shannon Diversity ( $H'$ ) and its value was 2.73.

Among 22 species collected 7 species was ranked as 'Rare', 14 species were 'Common' and 1 species was 'Abundant'. *Dolbina inexacta* was the only abundant hawkmoth species in Daksinkali forest area as indicated by total catch of 26 individuals and the value of Berger-Parker Dominance index is 0.222.

Hence, from value of diversity indices, it shows that site A is more diverse than site B and reduction in dominance of one species.

The relation between average monthly temperature and monthly number of species captured showed the general trend of increase of number of species with the increase in temperature, except for the month July. The Correlation coefficient (Pearson  $r$ ) between the monthly Rainfall and monthly collected number of species was 0.4802, showed poor co-relationship.

Key words: Hawk moths, Dakshinkali forest, species diversity, Shannon diversity index,



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## ACRONYMS

HMG	:	His Majesty Government
NARC	:	National Agricultural Research Council
NHM	:	Natural History Museum
spp.	:	species