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Diversity of moths in indalwai reserve forest area, Nizamabad district, Telangana, India

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Abstract

Moths are primarily nocturnal, potentially bio-indicators, global, agricultural pests, and nighttime pollinators. For the moth fauna in the Indalwai forest, the current study will be the first to report on species diversity, species composition, abundance, and distributional pattern. In the year 2023, a comprehensive survey was carried out in the forest area of Indalwai and its environs from September to December. In the course of the investigation, we identified 36 species from 36 genera and 9 families. The Erebidae family was the most dominant of the nine moth families that have been identified. The Crambidae family came in second, followed by the Geometridae in third and Sphingidae family in fourth place. The fifth place was occupied by Saturnidae and Nolidae families. And from the Uraniidae, Cossidae, and Noctuidae families, only one species was found.

Keywords: Moths, nocturnal, lepidoptera, diversity, Indalwai, Nizamabad

Introduction

Moths belong to Order Lepidoptera, characterized by drablycolored scales on the body, epiphysis on the foreleg, phytophagous and predominantly nocturnal nature. They are very sensitive to climate changes and vegetation alterations, making them an important group for monitoring climate and habitat changes (Thomas, 2005) [1]. They are also considered vital for ecosystem services because of various roles such as agricultural pests (Sharma and Bisen, 2013) [2], food for mammals (Vaughan, 1997) [3], birds (Wilson *et al*., 1999) [4], and night pollinators (Macgregor *et al*., 2015) [5]. Moths and butterflies contribute to essential ecosystem processes such as pollination, herbivory and decomposition in many terrestrial biomes (Lomov *et al*, 2006) [6]. Moths and butterflies are strongly associated with vegetation structure and composition, which makes them a suitable indicator taxon for various ecological studies (Lomov *et al*., 2006) [6]. Because of high sensitivity to the environmental change (Luff and Woiwod, 1995) [7] and proved to be powerful indicator of forest disturbance (Kitching *et al*., 2000; Summerville *et al*., 2004) [8, 9] moth communities are receiving increasing conservation interest (Scalercio *et al*., 2009) [10].

Materials &Methods

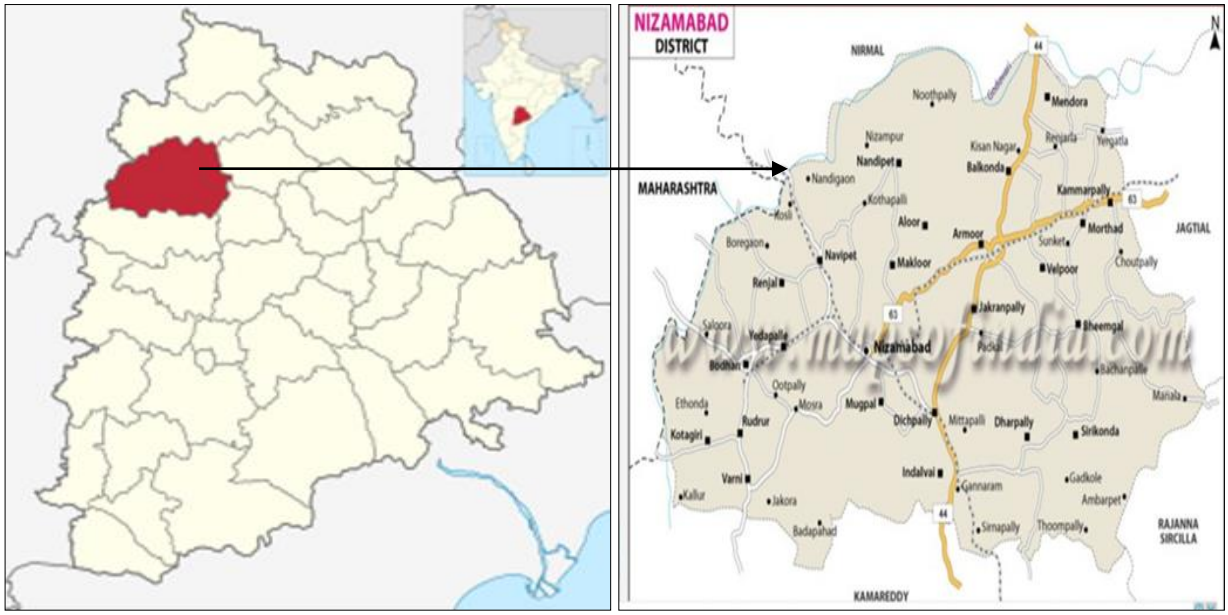

Fig 1: Indalwai Reserve Forest area in Nizamabad district

The Indalwai Reserve Forest is a protected area located in the Nizamabad district of Telangana, India.

The survey was carried out with the goal of gathering moth fauna from the Ranjit Sagar Dam Conservation Sites in Punjab. Moth gathering took place from use a light trap from the evening through the following morning from the month September to December 2023.

With the aid of identified specimens and existing literature, the moths were identified with the help of other published literatures included Kirti and Singh (2015, 2016) [14, 15], Shubhalaxmi (2018) [27], Kirti *et al*. (2019) [16], and Hampson (1892, 1894, 1895 and 1896) [7, 8, 9, 10].

Throughout the course of almost four months, from September 2023 to December 2023 sampling was done in the forest habitat. Two 100 m line transects, each encompassing an area of 100 m × 40 m, were created in the forest habitat to cover the vegetation communities. To collect samples of both nocturnal and diurnal moths, two days in a row were tested, along with one night in the final week of the month. For a total of 16 days, sampling was done, with the hours for diurnal moths being 8 a.m. to 11 a.m. and 3 p.m. to 6 p.m., and for nocturnal moths being 6 p.m. to 8 p.m. and 5 a.m. to 6 a.m. using moth species identification.

Result & Discussion

Indalwai reserve forest displays a remarkable diversity of ecosystems, such as gardens, lakes, farms, grasslands, and woodlands with an abundance of trees, shrubs, herbs, and climbers. There is an abundance of different vascular and Medicinal plant species include Azadirachta indica, Tectona grandis, Tamarindus indica, Cassia spp., Acacia spp., Ailanthus excelsa, Cassia spp., Cedrus deodara, Dalbergia sissoo, Mangifera indica, Quercus spp., Ziziphus glaberrima, etc.

The nutrition of adult moths differs from that of caterpillars. They can absorb liquids using large, straw-like mouthparts called a proboscis. The most popular dietary source for adult moths is flower nectar. A few mature moths will consume rotten fruit as food. Certain mature moths consume tree sap as food. Aphids and other scale insects secrete sweet liquid called honeydew, which certain adult moths will eat. As predators, several moth caterpillars will consume other insects.

During the present study we recorded 36 species belongs to 36 genera and 09 families. Out of 09 recorded families of moth, family Erebidae was the most dominated with 33.33% (12 species) which was followed by Crambidae 19.44% (7 species), Geometridae16.66%, (6 species), Sphingidae 11.11%, (4 species), Saturnidae 5.5% (2 Species) Nolidae 5.5%, (2 species) and Only one species were recorded from Uraniidae (2.25%), Cossidae (2.25%) Noctuidae (2.25%).

Olepa ricini

Nygmiini

Spirama retorta

Orgyia definita

Cyana peregrina

Asota caricae

Orvasca subnotata

Aemene taprobanis

Syntomoides imaon

Arachnis picta

Eudocima phalinia

Plecoptera quadrilineata

Hyles hippophaes

Pandora sphinx

Agrius convolvuli

Daphnis nerii

Micronia aculeate

Actias luna

Antheraea polyphemus

Spilomelinae

Cnaphalocrocis medinalis

Spoladea recurvalis

Metoeca foedalis

Pyrausta signatalis

Diaphania indica

Parapoynx fluctuosalis

Racheospila

Scopula immutata

Hypomecis transcissa

Pleuroprucha insulsaria

Iridopsis defectaria

Idaea aversata

Ceanothus nola moth

Aquita* horridella** ***Xyleutes persona ***Amyna axis Guenée***

Fig 2: Identified Moth Species

Table 1

S.No	Scientific name	Common name	Family
1	*Olepa ricini*	Hairy caterpiller	Erebidae
2	*Nygmiini*	Tussock moths	Erebidae
3	*Spirama retorta*	The Indian Owlet-moth	Erebidae
4	*Orgyia definita*	Definite tussock moth	Erebidae
5	*Cyana* peregrina	--	Erebidae
6	*Asota caricae*	Tropical tiger moth	Erebidae
7	*Orvasca subnotata*	Nygmiine tussock moth	Erebidae
8	*Aemene taprobanis*	--	Erebidae
9	*Syntomoides imaon*	Hand maiden moth	Erebidae
10	*Arachnis picta*	Painted tiger moth	Erebidae
11	*Eudocima phalinia*	Fruit piercing moth	Erebidae
12	*Plecoptera quadrilineata*	---	Erebidae
13	*Hyles hippophaes*	Seathorn hawk-moth	Sphingidae
14	*Pandora sphinx*	Pandora sphinx moth	Sphingidae
15	*Agrius convolvuli*	convolvulus hawk-moth	Sphingidae
16	*Daphnis nerii*	Oleander hawk-moth or Army green moth	Sphingidae
17	*Micronia aculeate*	Spotted swallowtail-moth	Uraniidae
18	*Actias luna*	Giant silk moths	Saturniidae
19	*Antheraea polyphemus*	*Polyphemus moth*	Saturniidae
20	*Spilomelinae*	Pearl moth	Crambidae
21	*Cnaphalocrocis medinalis*	The rice leaf roller	Crambidae
22	*Spoladea recurvalis*	The beet webworm moth	Crambidae
23	*Metoeca foedalis*	--	Crambidae
24	*Pyrausta signatalis*	Snout moth	Crambidae
25	*Diaphania indica*	Cucumber moth	Crambidae
26	*Parapoynx fluctuosalis*	Waved China-mark	Crambidae
27	*Racheospila astraeoides*		Geometridae
28	*Scopula immutata*	The lesser cream wave	Geometridae
29	*Hypomecis transcissa*	Looper moth	Geometridae
30	*Pleuroprucha insulsaria*	Common tan wave moth	Geometridae
31	*Iridopsis defectaria*	Brown –shaded grey moth	Geometridae
32	*Idaea aversata*	Riband wave moth	Geometridae
33	*Ceanothus nola*	Nola minna moth	Nolidae
34	*Aquita tactalis*	---	Nolidae
35	*Xyleutes persona*	Wood moth	Cossidae
36	*Amyna axis Guenée*	Oriental eight -spot	Noctuidae

Table 2: Number of Moth Species Recorded from Different Families

S.No	Family	No. of Species
1	Erebidae	12
2	Crambidae	7
3	Geometridae	6
4	Sphingidae	4
5	Saturnidae	2
6	Nolidae	2
7	Uraniidae	1
8	Cossidae	1
9	Noctiuide	1

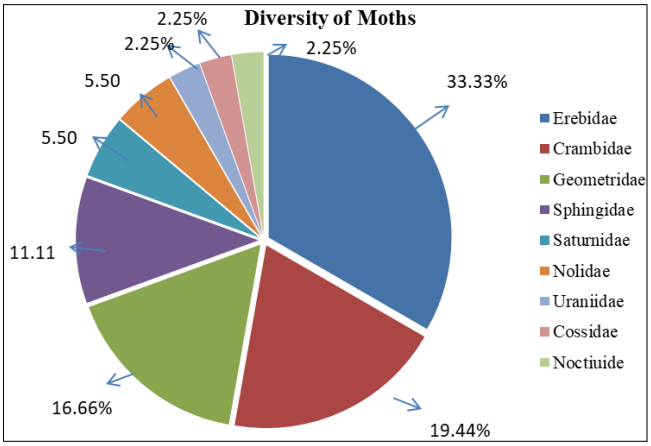

Fig 3: Family wise Percentages of Identified Moths

Conclusion

For many moth species, the habitats—which range from wetlands to agricultural plains to dry deciduous forests—offer ideal breeding and feeding grounds. These are but a handful of the numerous moth species that can be found in the Reserve Forest of Indalwai. These amazing animals depend on the vast biodiversity of the area as their home, thus it's critical to preserve their natural habitats. Protecting moths and other pollinators can be achieved by avoiding the use of toxic herbicides and insecticides. Moths and other species depend on woods and other natural areas for their home, which can only be preserved. Gaining public support for conservation initiatives can be achieved by educating people about the significance of moths. We can contribute to ensuring that moths in the Indalwai Reserve Forest have a good future by doing these actions.

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