

DIVERSITY OF MOTHS IN YADGIR DISTRICT, KARNATAKA, INDIA.

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Abstract

The moth fauna of Yadgir District, Karnataka, offers a glimpse into the region's rich nocturnal biodiversity. This study documents the diversity of moths across various habitats within the district, resulting in the identification of 60 species belonging to 6 distinct families. Fieldwork was held during the months of October 2024 and September 2025 by using light-trap method, ensuring minimal disturbance to the natural environment. The recorded families include Erebidae, Sphingidae, Geometridae, Uraniidae Noctuidae, and Crambidae, showcasing a broad spectrum of ecological roles and adaptations. This paper highlights Yadgir district as a valuable zone for lepidopteron diversity, emphasizing the need for continued documentation and conservation of these ecologically significant insects. This preliminary inventory paves the way for future studies and promotes awareness of moths as key indicators of environmental health.

Keywords: Biodiversity, Conservation, Moths, Yadgir

Introduction:

Yadgir district is located in the dry sub-humid lands of Karnataka, with dry weather for most of the year. The soil types in the district are deep black, medium black, shallow soil, and lateritic soil (Roa *et al.*, 2021). Moths are classified within the order Lepidoptera, distinguished by their muted-colored scales covering the body, the presence of an epiphysis on the foreleg, and their herbivorous diet, along with a primarily nocturnal lifestyle

(Variragade 2024). Some Lepidoptera are truly aquatic (Sarikar and Vijaykumar 2023). Insects that live underwater possess an extensive record of tracking water quality that is appropriate for environmental effect assessments. (Sarikar and Vijaykumar 2022). Water quality is influenced by manmade elements like urbanisation, business sectors, and farming activities in addition to natural elements like precipitation, rock sedimentation, weathering, etc. (Sarikar and Vijaykumar 2022). This faunal group, which is particularly vulnerable to light traps, presents an intriguing opportunity for ecological investigations (Choudhury *et al.*, 2024). Moths are ecologically and economically significant in the ecosystem (Perven and Khan 2018). Moths inhabit a wide range of environments. Observation, evaluation and diversity are regarded as essential instruments for managing conservation. (Dar and Jamal 2021). Their delicate ecosystem needs to maintain harmony with their surrounds, especially in light of contamination and human growth (Sarikar *et al.*, 2023). The insects are distinct among wildlife due to their variety, biological significance, and impact on food production, human well-being, and the environment (Sarikar and Sarikar 2025). This study focuses on the diversity of moth fauna and species richness of moths in the Yadgir district.

Material and methods:

Study area

Yadgir District, located in the northeastern part of Karnataka, India, spans a geographical area of approximately 5,234 square kilometers. Bounded by the Krishna River in the north and characterized by a semi-arid climate, the district lies between latitudes 16°30' N to 17°30' N and Longitudes 76°30' E to 77°30' E. (Nautiyal *et al.*, 2013). Three different habitats have been chosen for the moth collection, as shown in Fig. 1.

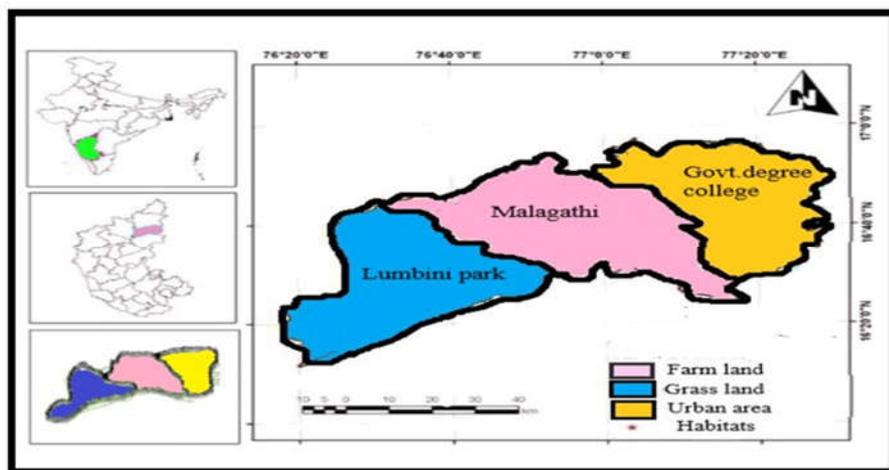


Figure 1. Map of India showing Yadgir District in Karnataka state

Methodology

Sampling and identification of moth insect species

Moths were collected using light traps equipped with UV lamps. Traps were activated at dusk and monitored until dawn to capture nocturnal specimens (Nirmal *et al.*, 2017). Each captured moth was carefully removed using forceps and placed in labelled containers for transport. Collected specimens were identified based on wing patterns, size, and taxonomic keys (Schachat and Brown 2017). Specimens that required detailed examination were preserved in 70% ethanol or pinned for drying, depending on the method suitable for later analysis.

Data analysis

Diversity indices

Diversity indices carried like Shannon index, Simpson index, Reciprocal Simpson index and Margalef richness index were calculated by using past 4.03 software

Result and Discussion:

The present study was carried out on the diversity of the moth population in the Yadgir district from October 2024 to September 2025. Insect sampling was done by the light-trap method, identified and documentation as taxonomy wise. The current study reveals a total of 8261 individuals were found in which comprised 6 families, and 60 different species. The most species richness family was the Erebidae family, with 34 of the richness. Meanwhile, Families like Sphingidae, Crambidae, and Geometridae share 6, 9, and 6, with moderately richness families and Families like Uraniidae and Noctuidae share 2, and 3 with the least number of moth families richness. Sarikar *et al.*, recorded Erebidae family with highest moth family containing 44 moth insect species in Kalaburagi district. In farmland habitat moth species highly recorded compared to other two habitats. Simpson's reciprocal index value was 2.805, and Shannon-Weiner index value was 1.1919; hence, the values are found to be greater than 1, indicating good diversity of moth insect fauna in Yadgir district.

Table No:1 List of moth collected from Yadgir district

Sl.No	Family	Species	Farmland area	Grassland area	Urban area
1.	Erebidae	<i>Amata cyssea</i>	91	81	73
2.		<i>Amata passalis</i>	99	89	79
3.		<i>Pericyma umbrina</i>	64	56	46
4.		<i>Cyana peregrine</i>	28	18	14
5.		<i>Spirama helicina</i>	18	14	11
6.		<i>Digama hearseyana</i>	44	35	29
7.		<i>Mangina argus</i>	51	42	29
8.		<i>Cretonotos interrupta</i>	26	18	14
9.		<i>Achaea janata</i>	68	58	51
10.		<i>Bastilla torrid</i>	32	27	15
11.		<i>Hypena sp</i>	65	55	43
12.		<i>Eudocima homaena</i>	30	24	18
13.		<i>Pyrrharcia isabella</i>	22	15	8
14.		<i>Erebus hieroglyphica</i>	45	37	30
15.		<i>Spirama retorta</i>	58	50	41
16.		<i>Erebus macrops</i>	44	34	25

17.		<i>Ataboruza divisa</i>	42	35	24
18.		<i>Olene mendosa</i>	57	46	37
19.		<i>Artaxa spp</i>	62	54	46
20.		<i>Aloa lactinea</i>	49	41	34
21.		<i>Ercheia cyllaria</i>	23	16	12
22.		<i>Eudocima materna</i>	110	100	91
23.		<i>Euproctis lunata</i>	88	80	71
24.		<i>Miltochrista obsoleta</i>	74	66	58
25.		<i>Asota caricae</i>	84	74	60
26.		<i>Eudocima homaena</i>	56	49	38
27.		<i>Eudocima phalonia</i>	59	53	42
28.		<i>Dichromia sagitta</i>	48	38	31
29.		<i>Orgyia postica</i>	53	44	36
30.		<i>Artena dotata</i>	43	31	24
31.		<i>Asota ficus</i>	55	60	51
32.		<i>Olepa ricini</i>	113	105	95
33.		<i>Plecoptera sp</i>	77	53	44
34.		<i>Mocis frugalis</i>	63	51	46
35.	Uraniidae	<i>Phazaca theclata</i>	20	10	5
36.		<i>Micronia aculeata</i>	64	55	47
37.	Crambidae	<i>Maruca vitrata</i>	73	66	51
38.		<i>Poliobotys ablactalis</i>	62	53	43
39.		<i>Spoladea recurvalis</i>	112	105	98
40.		<i>Paliga machoeralis</i>	57	48	41
41.		<i>Cnaphalocrocis medinalis</i>	93	86	80
42.		<i>Rivula sericealis</i>	71	64	57
43.		<i>Nausinoe geometralis</i>	55	42	34
44.		<i>Parapoynx diminutalis</i>	53	40	34
45.		<i>Haritalodes sp</i>	42	36	30
46.	Geometridae	<i>Chiasmia emersaria</i>	66	60	52
47.		<i>Scopula pulchellata</i>	49	41	36
48.		<i>Scopula spp</i>	62	56	50
49.		<i>Thalassodes dissita</i>	49	42	37
50.		<i>Traminda mundissima</i>	59	52	45
51.		<i>Hypomecis sp</i>	45	35	29
52.	Sphingidae	<i>Daphnis nerii</i>	30	23	17
53.		<i>Acherontia styx</i>	22	17	13
54.		<i>Theretra nessus</i>	14	8	7
55.		<i>Agrius convolvuli</i>	5	4	4
56.		<i>Hippotion celerio</i>	6	5	3
57.		<i>Psilogamma increta</i>	11	9	8
58.	Noctuidae	<i>Aegocera venulia</i>	60	50	41
59.		<i>Spodoptera litura</i>	82	73	65
60.		<i>Helicoverpa armigera</i>	18	11	7
Total	6	60	3221	2740	2300

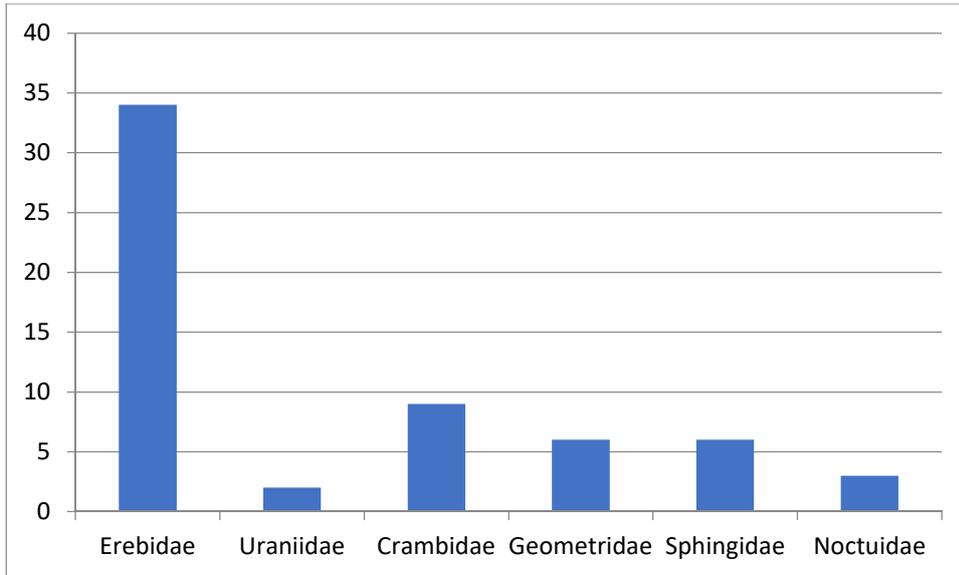


Figure 2. Showing the number of moth families

Table 2: Diversity indices of moth species

Shannon index	1.1919
Simpson index	0.3565
Reciprocal Simpson index	2.805
Margalef richness index	1.221

Conclusion

There were deemed to be a good number of moth species in the study area. The study reported 60 species of moths in Yadgir district, meanwhile the Erebidae family having the highest family. Therefore, the current study will act as a basis for further research. To completely comprehend the ecology of the local moth, however, more studies on a broader range of moth varieties are required.

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