



Research Paper

Moth Fauna (Lepidoptera: Glossata) of Ken-Gharial Wildlife Sanctuary, Panna and Chhatarpur district of Madhya Pradesh

Sanjay Paunikar* and Akhil Nair

Zoological Survey of India, Central Zone Regional Centre, Plot No. 168/169, Scheme No. 05
SBI, Square, Vijay Nagar, Jabalpur, Madhya Pradesh, India

*Corresponding author email: sanjaypaunikarzsi@gmail.com

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Abstract: The study was conducted in order to explore moth fauna of Ken- Gharial Wildlife Sanctuary & its surrounding area in Panna and Chhatarpur district of Madhya Pradesh, Central India. The present study recorded 77 species of moths belonging to 69 genera, 11 families under 23 subfamilies and 6 Super families. The highest species richness was shown by the family Erebidæ followed by the families Crambidae, Geometridæ, Noctuidæ and Sphingidae. The families Limacodidae with 3 and Lasiocampidae with 2 species recorded. The others Bombycidae, Eupterotidae, Nolidae and Notodontidae families comprising of one species each were recorded from the study area. The results of this study are promising; it sheds light on the unknown moth biodiversity of Ken-Gharial Wildlife Sanctuary.

Keywords: Lepidoptera, Heterocera, Moths, Ken-Gharial WLS, Panna, Madhya Pradesh.

Introduction:

Moths are belonging to order lepidoptera and share with butterfly. They are nocturnal

habitat, holometabolous, phytophagous and cryptic coloration insects (Srivastava, 2002; Lees and Zilli, 2019; Paunikar, *et al.*, 2021). They occur in all kinds of habitats including natural forests, grasslands, forest nurseries, agro-horticulture fields and crop plantations (Joshi *et al.*, 2004; Kathirvelu, *et al.*, 2019; Paunikar and Sharma, 2022). The moths provide valuable ecosystem services such as pollination of crepuscular and night blooming flowering plants and their role as prey in food chain (MacGregoret *et al.*, 2015, Wagner *et al.*, 2021; Singh *et al.*, 2022a). They are also prey of numbers of predators of numbers of vetrbrates and invetrbrates animals (Wilson *et al.*, 1999; Kitching, *et al.*, 2000; Sondhi and Sondhi, 2016). These insects are often considered as bio- indicator material in biological studies because they are sensitive to habitat change (Kendrick, 2007; Sivasankaran *et al.*, 2011; Paunikar *et al.*, 2023). The economic importance of different families of moths can be attributed to the fact that it includes a significant number of major and minor pest species, and therefore their distributional knowledge is

highly for the economy of any country (Bin-Cheng 1994; Paunikar *et al.*, 2024).

The different renowned workers studied the moth fauna of India since 19th century. The numbers of moth species details are not available in India earlier. But, recently, Singh *et al.* (2024) compiled 11, 745 the number of species of the moth in India.

The history of moth diversity of Madhya Pradesh had studied in nineteenth century by various researchers (Chandra and Nema, 2003). The compilation of moth diversity from Central India including Madhya Pradesh and Chhattisgarh includes 313 species/subspecies of moths belonging to 221 genera and 25 families (Chandra and Nema, 2007). After that, further, additions done in the moth fauna of national parks, wildlife sanctuaries and biosphere reserves of Madhya Pradesh from time to time by Ramakrishna *et al.* (2006); Chandra and Nema, (2003); Chandra and Nema (2008); Chandra (2009a, 2009b), Chandra and Sambath, (2016ab); Sambath, (2017a; 2017b; 2018a; 2018b; 2020, 2022); Sambath and Nair (2023); Roshni *et al.* (2020a; 2020b); Paunikar *et al.* (2024) and Paunikar and Nair, (2025). Singh *et al.* (2022b) compiled 221 species of the moth fauna of Madhya Pradesh.

Study Area:

The state Madhya Pradesh is famous for its unique and versatile forest covers, faunal

and floral biodiversity. The state has several worlds recognized and National parks, Wildlife sanctuaries, Biosphere Reserves and Tiger Reserves. Among the wild life sanctuaries, Ken-Gharial wildlife sanctuary (24°53'26" N, 80°04'36" E) is one of the most important and famous for gharial conservation. It is situated in Khajuraho district of Madhya Pradesh and established in 1981 along a 45 km stretch of the Ken River and Khudar River, primarily for the protection of gharials. It is located in north-east of Khajuraho temples and North of Panna Biosphere Reserve. It lies in Chhatarpur district of Madhya Pradesh and lies in north of state in Central India. The WLS is most famous for its varied floral and faunal diversity and the tourists from Khajuraho and Panna national park visits this gharial sanctuary. Their landscapes are almost of similar type with features like green forests, rocky outcrops, deep gorges, long canyons, waterfalls etc. These types of landscapes are very photogenic and also adventurous too. Raneh fall is deep canyon, natural rocky structures. And colorful rocky shades like pink, yellow rocks of Sand-stone and granite-stones are unique attraction. It offers good chance to see innumerable gharials sun basking. In this sanctuary some sighting of wild animals is also very common like Spotted Deers, Wild boar, Nilgai etc.



Google Source-Map of Ken-Gharial Wildlife Sanctuary



Ken-Ghariyal Wildlife Sanctuary

Material and Methods:

In order to collect moth specimens to prepare the partial checklist of moths, various localities of Ken-Gharial Wildlife Sanctuary and surrounding localities were systematically surveyed during 2022 to 2024. Moth collection was collected monthly with the help of light traps and light sheet traps from 19:00 to 23:00. The light sheet trap (3 x 2 m) was operated using a 20W UV fluorescent light bulb with a length of 50 cm and the power source of a portable 12 Volt lead battery. The specimens resting on the wall under the wall lights were collected using small plastic containers and vials which were then administered with cotton soaked in ethyl acetate that was used as the insect killing poison. The identification of moths was confirmed using various literatures like the fauna of British India (Hampson, 1892- 1894), other published literatures Kirti and Singh (2015, 2016); Shubhalaxmi (2018), Kirti *et al.* (2019); Kalawate *et al.* (2024) and other publications. The moth samples were also

identified by comparing the specimen with the specimen available at Zoological Survey of India (ZSI), Jabalpur, few specimens are also identified through photographs that have been previously identified by lepidopterists..Web resources dedicated to lepidopteran diversity were also utilized to confirm or check the species names.

Results and Discussion:

The present study recorded 77 species of moths belonging to 69 genera, 6 Super families, 11 families and 23 Sub families. All the moths in the checklist are illustrated in the (Table 1; Fig:1). From this study, it was noted that family Erebidæ, had the highest species richness with 37.66% of the total species that was followed by Crambidae, Geometridæ, Noctuidæ and Sphingidae with 16.88%, 16.88%, 9.09% and 7.79% of the total species respectively. These five families composition with 68 species with 88.31% and the rest of the

families composition about 11.68% of the total species, only. The families, Erebiidae (29 species, 24 genera) showed the highest compared to Crambidae (13 species and genera) followed by Geometridae (13 species and 12 genera), Noctuidae (7 species and 6 genera) and Sphingidae (6 species and 5 genera). The other families Limacodidae (3 species and genera), Lasiocampidae (2 species and genera each), Bombycidae (1 species and genera), Eupterotidae (1 species and genera), Nolidae (1 species and genera) and Notodontidae (1 species and genera) showed lower species and genera in the study area.

The highest richness of family Erebiidae, Crambidae, Geometridae and Noctuidae in the study could be attributed to the various forest and agro- ecosystems and grassy vegetation types surrounding the wildlife sanctuary. The higher species richness within the families Crambidae, Erebiidae, Geometridae, and Noctuidae has also been reported from similar observations from other parts of India (Alex *et al.*, 2021 and Biswas *et al.*, 2016).

Several studies indicated that the Erebiidae was the most dominant families in the forest as well as agro ecosystem in India (Swafvan and Sureshan, 2022; Paunikar and Nair, 2025). The reports on moth diversity are available of different national parks, wildlife sanctuaries, tigers and biosphere reserves of Madhya Pradesh.

Chandra and Sambath (2016ab) studied reveals that the moths of two conservation areas viz., Singori and Veerangana

Durgawati Wildlife Sanctuaries of Madhya Pradesh wherein reported 65 species and 90 species respectively. Sambath (2022) studied and documented moth fauna of Nauradehi Wildlife Sanctuary wherein reported 89 species, 80 genera under 13 families. However, perusal of literature shows that Ramakrishna *et al.* (2006) compiled and documented 54 species of moths in National Parks of Madhya Pradesh. Singh *et al.* (2022) documented 226 species of moth from Madhya Pradesh. Sambath and Nair (2023) reported 110 species under 16 families and seven superfamilies of moth from Sanjay-Dubri National Park and Tiger reserves of Sidhi district of Madhya Pradesh. Paunikar *et al.* (2024) reported 102 moth species, 87 genera under 25 subfamilies, 13 families, and 07 superfamilies from different localities Ratapani Wildlife Sanctuary and Tiger Reserve, Sehore and Raisen district of Madhya Pradesh. Recently, Paunikar and Nair (2025) recorded 148 species, 121 genera, 44 subfamilies under 17 families and 10 superfamilies from Gandhisagar Wildlife Sanctuary, Mandsaur and Neemach district of Madhya Pradesh.

This study was an attempt to describe some aspects of biodiversity of moth fauna of Ken-Gharial Wildlife Sanctuary of Panna and Chhatarpur district of Madhya Pradesh.

Table 1: Moth fauna of Ken- Gharial Wildlife Sanctuary, Panna and Chhatarpur districts, Madhya Pradesh

Species	Family	Subfamily
Superfamily: Pyraloidea Latreille, 1809		
1. <i>Agroteris scissalis</i> (Walker, 1866)	Crambidae	Spilomelinae
2. <i>Cnaphalocrocis medinalis</i> Guenee, 1854	Crambidae	Spilomelinae
3. <i>Conogethes punctiferalis</i> (Guenee, 1854)	Crambidae	Spilomelinae
4. <i>Cydalima laticostalis</i> Guenee, 1854	Crambidae	Spilomelinae
5. <i>Diaphania indica</i> Saunders, 1851	Crambidae	Spilomelinae
6. <i>Synclera traducalis</i> (Zeller, 1852)	Crambidae	Spilomelinae
7. <i>Glyphodes bicolor</i> (Swainson, 1821)	Crambidae	Spilomelinae
8. <i>Maruca vitrata</i> (Fabricius, 1787)	Crambidae	Spilomelinae
9. <i>Sameodes cancellalis</i> (Zeller, 1852)	Crambidae	Spilomelinae
10. <i>Spoladea recurralis</i> Fabricius, 1787	Crambidae	Spilomelinae
11. <i>Haritalodes derogate</i> (Fabricius, 1775)	Crambidae	Spilomelinae
12. <i>Eoophyla peribocalis</i> (Walker, 1859)	Crambidae	Acentropinae
13. <i>Pyrausta panopealis</i> (Walker, 1859)	Crambidae	Pyraustinae
Superfamily: Noctuoidea Latreille, 1809		
14. <i>Antheua servula</i> Drury, 1773	Notodontidae	Spataliinae
15. <i>Asota ficus</i> Fabricius, 1775	Erebidae	Aganainae
16. <i>Asota caricae</i> Fabricius, 1775	Erebidae	Aganainae
17. <i>Aloa lactinea</i> (Cramer, 1777)	Erebidae	Arctiinae
18. <i>Amata cyssea</i> Stoll, 1782	Erebidae	Arctiinae
19. <i>Argina astrea</i> Drury, 1773	Erebidae	Arctiinae
20. <i>Brunia antica</i> Walker, 1854	Erebidae	Arctiinae
21. <i>Cretonotos gangis</i> Linnaeus, 1758	Erebidae	Arctiinae
22. <i>Cretonotos transiens</i> (Walker, 1855)	Erebidae	Arctiinae
23. <i>Eressa confinis</i> Walker, 1854	Erebidae	Arctiinae
24. <i>Rajendra biguttata</i> (Walker, 1855)	Erebidae	Arctiinae
25. <i>Spilarctia oblique</i> Walker, 1855	Erebidae	Arctiinae
26. <i>Syntomoides imaon</i> (Cramer, 1779)	Erebidae	Arctiinae
27. <i>Utetheisa lotrix</i> (Cramer, 1779)	Erebidae	Arctiinae
28. <i>Utetheisa pulchelloides</i> Hampson, 1907	Erebidae	Arctiinae
29. <i>Hypocala restrata</i> (Fabricius, 1794)	Erebidae	Calpinae
30. <i>Trigonodes hyppasia</i> Cramer, (1779)	Erebidae	Erebinae
31. <i>Cyana puella</i> Drury, 1773	Erebidae	Erebinae
32. <i>Chalciope mygdon</i> Cramer, 1777	Erebidae	Erebinae
33. <i>Mocis frugalis</i> Fabricius, 1775	Erebidae	Erebinae
34. <i>Mocis undata</i> Fabricius, 1775	Erebidae	Erebinae
35. <i>Erebus hieroglyphica</i> (Drury, 1773)	Erebidae	Erebinae
36. <i>Hypena abysinialis</i> Guenee, 1854	Erebidae	Lymantriinae
37. <i>Euproctis lunata</i> Walker, 1855	Erebidae	Lymantriinae
38. <i>Lymantria incerta</i> Walker, 1855	Erebidae	Lymantriinae
39. <i>Lymantria serva</i> Fabricius, 1793	Erebidae	Lymantriinae

40. <i>Perina nuda</i> Fabricius, 1787 41. <i>Orvasca subnotata</i> Walker, 1865 42. <i>Episparis liturata</i> Fabricius, 1787 43. <i>Anomis flava</i> Fabricius, 1775 44. <i>Carea angulate</i> Fabricius, 1793 45. <i>Helicoverpa armigera</i> Hubner, 1805 46. <i>Mythimna separata</i> Walker, 1865 47. <i>Spodoptera litura</i> Fabricius, 1775 48. <i>Agrotis biconica</i> Kollar, 1844 49. <i>Agrotis segetum</i> (Denis & Schiffermuller, 1775) 50. <i>Chrysodeixis acuta</i> (Walker, 1858) 51. <i>Thysanoplusia orichalcea</i> Fabricius, 1775	Erebidae Erebidae Erebidae Erebidae Nolidae Noctuidae Noctuidae Noctuidae Noctuidae Noctuidae Noctuidae Noctuidae	Lymantriinae Lymantriinae Pangraptinae Scoliopteryginae Chloephorinae Heliothinae Noctuinae Noctuinae Noctuinae Noctuinae Noctuinae Plusiinae Plusiinae
Superfamily: Geometroidea Leach, 1815 52. <i>Ascotis selenaria</i> (Denis-Schiffermüller, [1865]) 53. <i>Biston suppressana</i> Guenee, 1854 54. <i>Chiasmia fidoniata</i> Guenee, 1858 55. <i>Chiasmia emersaria</i> Walker, 1861 56. <i>Zamarada excisa</i> Hampson, 1891 57. <i>Hyperythra lutea</i> Stoll, 1781 58. <i>Isturgia disputaria</i> Guenee, (1858) 59. <i>Hyposidra talaca</i> (Walker, 1860) 60. <i>Peteliamedardaria</i> Herrich-Schäffer, [1865] 61. <i>Scopulaemissaria</i> Walker, 1861 62. <i>Timandra mundissima</i> (Walker, 1861) 63. <i>Pelagodes falsaria</i> Prout, 1912 64. <i>Thalassodes quadraria</i> Guenee, (1857)	Geometridae Geometridae Geometridae Geometridae Geometridae Geometridae Geometridae Geometridae Geometridae Geometridae Geometridae Geometridae Geometridae	Ennominae Ennominae Ennominae Ennominae Ennominae Ennominae Ennominae Ennominae Ennominae Ennominae Sterrhinae Sterrhinae Geometrinae Geometrinae
Superfamily: Lasiocampoidea Harris, 1841 65. <i>Metanastria hyrtaea</i> (Cramer, 1782) 66. <i>Trabalavishnou</i> Lefebvre, 1827	Lasiocampidae Lasiocampidae	Lasiocampinae Lasiocampinae
Superfamily: Bombycoidea Latreille, 1802 67. <i>Eupterote undata</i> Blanchard, 1844 68. <i>Trilocha varians</i> Walker, 1854 69. <i>Cephonodes hylas</i> (Linnaeus, 1771) 70. <i>Hippotion celerio</i> (Linnaeus, 1758) 71. <i>Hippotion boerhaviae</i> (Fabricius, 1775) 72. <i>Nephele hespera</i> (Fabricius, 1775) 73. <i>Agrius convolvuli</i> (Linnaeus, 1758) 74. <i>Theretra alecto</i> Linnaeus, 1758	Eupterotidae Bombycidae Sphingidae Sphingidae Sphingidae Sphingidae Sphingidae	Eupterotinae Bombycinae Macroglossinae Macroglossinae Macroglossinae Macroglossinae Macroglossinae
Superfamily: Zygaenoidea Latreille, 1809 75. <i>Birhamoides junctura</i> (Walker, 1865) 76. <i>Miresa albipuncta</i> Herrich-Schäffer, 1854 77. <i>Thosea tripartita</i> Moore, 1884	Limacodidae Limacodidae Limacodidae	Limacodinae Limacodinae Limacodinae

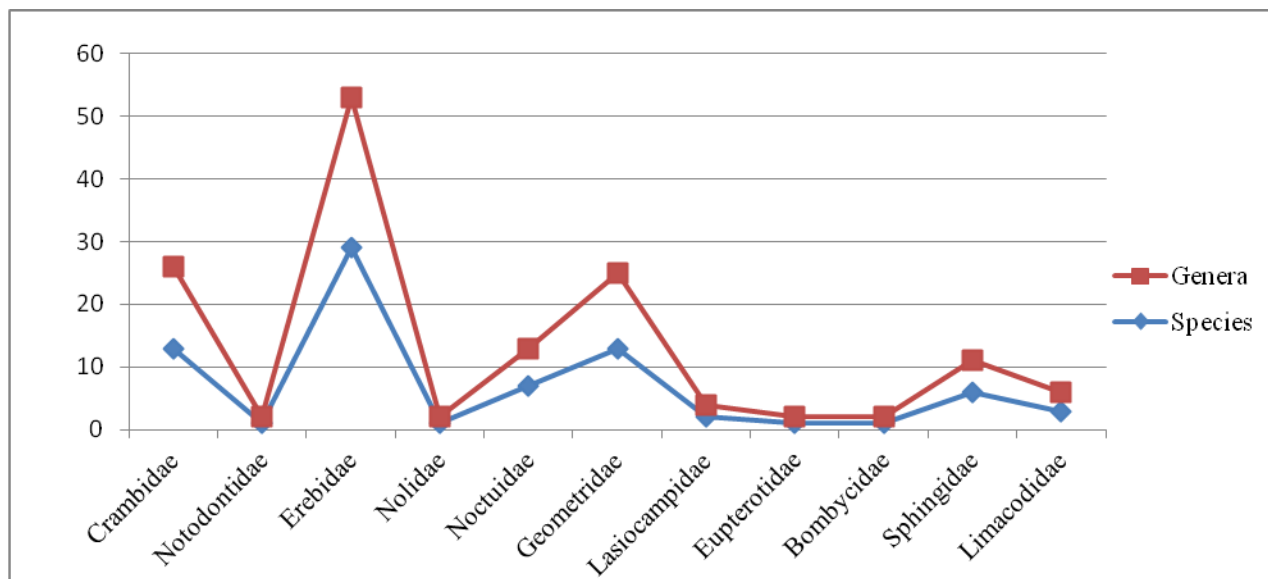


Fig 1: The graph showing the dominance of different Moths families, genera and species

Conclusion:

The biodiversity of moth fauna in Ken-Gharial Wildlife Sanctuary is mostly because of rich vegetation in this area. Vegetation plays a significant role that provides the main food source to insect fauna and abiotic factors plays important role in habitat structure. The results of this study are promising; it sheds light on the unknown moth biodiversity of Ken-Gharial Wildlife Sanctuary. The abundance of moth diversity found during this preliminary study assures that the diversity of moths in this area is huge.

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