

Diversity of moths in bor wildlife sanctuary, Maharashtra, India

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Abstract

The present survey was conducted on diversity of moths in Bor wildlife sanctuary of district Wardha, Maharashtra state of India during the month of July 2024 to December 2024. Moth species were trapped and photographed on 6' x 6' white screen cloth by using LED light traps (60w-200w). Total 104 species from 18 families and 47 subfamilies were recorded out of which 23 were identified on genus level and 81 on species level. The most diverse family of moth species recorded was family Erabidae, with 29% of moth species recorded in the study belonging to this family, followed by Crambidae (22%), Geometridae (12%) and others. Here we giving a list of 104 moth species recorded from Bor Wildlife Sanctuary, which improves our insight into the lesser known Lepidopterans from the state of Maharashtra. This shall further help us to strengthen our knowledge about the importance of moth species in our environment and contribute towards its conservation. While providing valuable insights, this study acknowledges its limitations due to a limited duration and the challenge of identifying moth species without some specimen collection.

Keywords: Moths, diversity, family, lepidoptera, bor wildlife sanctuary, Maharashtra

Introduction

Insects are the only invertebrates that can fly. Their capacity to fly makes them successful and allows them to colonize in new environmental conditions. Insects are commonly observed in five orders which makes them stand out as a high species community in Invertebrates: Coleoptera (The beetles), Diptera (True flies), Hymenoptera (Wasps, ants & bees), Hemiptera (True bugs) and Lepidoptera (Butterflies and moths) among which Lepidoptera is the second largest and most diverse order of the class Insecta (Benton, 1995) [2].

Moths are soft bodied mostly nocturnal but also crepuscular and diurnal insects with 1,60,000 worldwide noted species and 12,000 species reported in India (Chandra and Nema, 2007) [3]. Their various roles in ecosystem are vital such as herbivore, agricultural pests (Sharma & Bisen, 2013) [14], night pollinators (Macgregor *et al.*, 2015) [12], detritivores and prey for migratory passerines birds. Moths are considered to be the ecological indicators which monitor the changes taking place in the surrounding environment.

Several researchers from Maharashtra state have studied the diversity of moth fauna during their research work in different regions of Maharashtra. Hampson (1891) [10] during the survey reported total 611 species of moths from Maharashtra. Gurule *et al.*, 2010 [8] recorded 70 species of moths from Nashik district of Maharashtra from family Noctuidae (including Erebiidae). Shubhalaxmi *et al.*, 2011 [15] have recorded 418 moth taxa from 28 families & 15 super families from Northern Western Ghats of Maharashtra and also reported 11 species of moths from 5 families as a new record from India. Gurule and Nikam (2013) [9] reported 245 species of moths from northern Maharashtra. Pathre *et al.*,

2019 [13] have recorded total 112 species of Moths from Marathwada region belonging to 88 genera and 15 families. Many workers have studied the diversity of moth from different regions of Maharashtra, but no data available on the richness of diversity of moth species in Bor Wildlife Sanctuary. Thus, in the present investigation preliminary attempt was made to record the diversity of the moths through regular observation and identification in the various areas of Bor Wildlife Sanctuary.

Materials and Methods

1. Study Area

Bor Wildlife Sanctuary is located near Hingani in district Wardha of Maharashtra in India. It covers an area of 138.12 Km² (53.33 Sq. miles) at 20.962314⁰ N, 78.707707⁰ E altitude.



Fig 1: Map of Maharashtra State in India



Fig 2: Map of Wardha District showing Study area

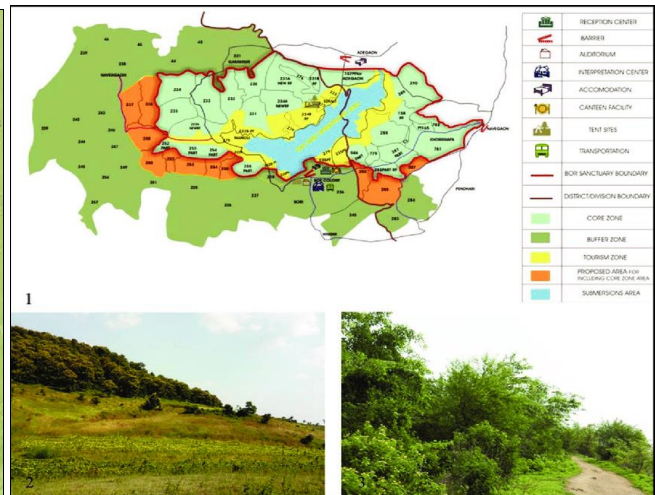


Fig 3: Bor Wildlife Sanctuary

It is declared as tiger reserve in July 2014. The elevation is 460m (1,510 ft.) MSL (Mean Sea Level). Climate is hot and dry. Average rainfall is 152.5 mm. The maximum temperature recorded in month of May i.e. 47.9°C and minimum in December i.e. 10.2°C.

Sampling, Collection and Identification

Present study and observation period was from July 2024 to December 2024. During the present study, different sites have been visited; moths were observed and photographed with AI-CAM photography system 50MP camera. Moth’s specimen were collected by using 6 ft. X 6 ft. white cloth screen with light (60 w – 200w) trap. Sample collection and photography of moths were carried out during 07:00pm to 11:00pm and also during morning hours and with the help of pertinent literature moths has been identified up to species level.

Result and Discussion

Bor Wildlife Sanctuary, the undiscovered and diversified area showed rich moth fauna. In the present study 104 moths species were recorded belonging to 18 families viz. Crambidae, Erebidae, Pyralidae, Lasiocampidae, Noctuidae, Cossidae, Sphingidae, Notodontidae, Geometridae, Gelechiidae, Bombycidae, Lecithoceridae, Pterophoridae, Limacodidae, Nolidae, Depressariidae, Eupterotidae,

Uraniidae (Table 1, Photoplate 1). From the above findings, it is revealed that family Erebidae was the most dominating family contributing 29% of the moth species recorded in the study belonging to this family, followed by family Crambidae as the second most dominating family by contributing 22%. Family Geometridae is the third most dominating family by contributing 12%. Family Noctuidae is the fourth dominating family by contributing 11% and other families constituting of the rest. (Fig.4). Gurule & Nikam (2013) [10], Gadhikar *et al.*, (2015) [7], Kalawate and Sharma (2017) [11], Ahire and Khobragade (2021) [1], in their research work also reported about the dominance of moth species from family Erebidae from different regions such as North Maharashtra region, Amravati city Maharashtra, Pench National Park and Ahmednagar college campus, Ahmednagar, Maharashtra respectively. Chandrakar *et al* (2022) [5] recorded 184, identified 163 moth species belonging to 10 families from Hinganghat taluka of district Wardha. Fernandes (2024) [6] recorded 193 moth species with 61 species dominance of Erebidae family followed by Crambidae with 42 species from Verna village of Goa. Chandra (2007) (4) recorded 142 moth species from 90 genera and 16 families of which Family Noctuidae, Erebidae and Crambidae are dominant families in Madhya Pradesh and Chhattisgarh.

Table 1: List of Moth species documented during the research

Sr. No.	Family	Subfamily	Species
1	Bombycidae	Bombycinae	<i>Trilocha varians</i> (Walker, 1855)
2	Cossidae	Zeuzerinae	<i>Azygophleps pusilla</i> (Walker, 1856)
3	Crambidae	Acentropinae	<i>Elophila scitalis</i> (Swinhoe, 1885)
4	Crambidae	Acentropinae	<i>Eoophyla</i> spp. (Swinhoe, 1900)
5	Crambidae	Acentropinae	<i>Nymphicula blandialis</i> (Walker, 1859)
6	Crambidae	Glaphyriinae	<i>Noorda</i> spp. (Walker, 1859)
7	Crambidae	Odontiinae	<i>Autocharis fessalis</i> (Swinhoe, 1886)
8	Crambidae	Pyraustinae	<i>Ecpyrrhorrhoes</i> spp. (Moore, 1886)
9	Crambidae	Pyraustinae	<i>Euclasta defamatalis</i> (Walker, 1859)
10	Crambidae	Pyraustinae	<i>Pyrausta salvialis</i> (Walker, 1859)
11	Crambidae	Pyraustinae	<i>Pyrausta phoenicealis</i> (Hübner, 1818)
12	Crambidae	Pyraustinae	<i>Pyrausta</i> spp. (Schrank, 1802)
13	Crambidae	Spilomelinae	<i>Antigastra catalaunalis</i> (Duponchel, 1833)
14	Crambidae	Spilomelinae	<i>Chabulina onychinalis</i> (Guenée, 1854)

15	Crambidae	Spilomelinae	<i>Cnaphalocrocis rutilalis</i> (Walker, 1859)
16	Crambidae	Spilomelinae	<i>Cydalima laticostalis</i> (Guenée, 1854)
17	Crambidae	Spilomelinae	<i>Eurrhparodes bracteolalis</i> (Zeller, 1852)
18	Crambidae	Spilomelinae	<i>Glyphodes bicolor</i> (Swainson, 1821)
19	Crambidae	Spilomelinae	<i>Haritalodes derogate</i> (Fabricius, 1775)
20	Crambidae	Spilomelinae	<i>Herpatogramma</i> spp. (Lederer, 1863)
21	Crambidae	Spilomelinae	<i>Omiodes milvinalis</i> (Swinhoe, 1886)
22	Crambidae	Spilomelinae	<i>Patania ruralis</i> (Scopoli, 1763)
23	Crambidae	Spilomelinae	<i>Pygospila tyres</i> (Cramer, 1780)
24	Crambidae	Spilomelinae	<i>Rehimena phrynealis</i> (Walker, 1859)
25	Crambidae	Spilomelinae	<i>Spoladea recurvalis</i> (Fabricius, 1775)
26	Depressariidae	Ethmiinae	<i>Ethmia oculigera</i> (Hübner, 1819)
27	Erebidae	Arctiinae	<i>Aloa lactinea</i> (Cramer, 1777)
28	Erebidae	Arctiinae	<i>Amata passalis</i> (Fabricius, 1781)
29	Erebidae	Arctiinae	<i>Argina astrea</i> (Drury, 1773)
30	Erebidae	Arctiinae	<i>Cretonotos transiens</i> (Walker, 1855)
31	Erebidae	Arctiinae	<i>Cyana puella</i> (Drury, 1773)
32	Erebidae	Arctiinae	<i>Micraloa</i> spp. (Dubatolov, 2004)
33	Erebidae	Arctiinae	<i>Mitochrista obsoleta</i> (Moore, 1878)
34	Erebidae	Arctiinae	<i>Olepa ricini</i> (Fabricius, 1775)
35	Erebidae	Arctiinae	<i>Rajendra biguttata</i> (Walker, 1855)
36	Erebidae	Boletobiinae	<i>Ataboruza divisa</i> (Walker, 1862)
37	Erebidae	Calpinae	<i>Culasta indecisa</i> (Moore, 1881)
38	Erebidae	Erebinae	<i>Acantholipes trajecta</i> (Walker, 1865)
39	Erebidae	Erebinae	<i>Dysgonia renalis</i> (Hampson, 1894)
40	Erebidae	Erebinae	<i>Epidromia</i> spp. (Guenée, 1852)
41	Erebidae	Erebinae	<i>Erebus hieroglyphica</i> (Drury, 1773)
42	Erebidae	Erebinae	<i>Ereceias</i> pp. (Walker, 1858)
43	Erebidae	Erebinae	<i>Hypocala deflorata</i> (Fabricius, 1775)
44	Erebidae	Erebinae	<i>Mocis undata</i> (Fabricius, 1775)
45	Erebidae	Erebinae	<i>Ophiusa tirhaca</i> (Cramer, 1777)
46	Erebidae	Erebinae	<i>Pandesma</i> spp. (Guenée, 1852)
47	Erebidae	Erebinae	<i>Trigonodes hyppasia</i> (Cramer, 1779)
48	Erebidae	Herminiinae	<i>Herminiinae</i> spp. (Leach, 1815)
49	Erebidae	Herminiinae	<i>Nodaria nodosalis</i> (Schäffer, 1851)
50	Erebidae	Hypeninae	<i>Hypena laceratalis</i> (Walker, 1859)
51	Erebidae	Hypeninae	<i>Hypena</i> spp. (Linnaeus, 1758)
52	Erebidae	Lymantriinae	<i>Euproctis leithiana</i> (Moore, 1879)
53	Erebidae	Lymantriinae	<i>Euproctis lunata</i> (Walker, 1855)
54	Erebidae	Lymantriinae	<i>Olene mendosa</i> (Hübner, 1823)
55	Erebidae	Lymantriinae	<i>Sphrageidus similensis</i> (Fuessly, 1775)
56	Erebidae	Rivulinae	<i>Rivula sericealis</i> (Scopoli, 1763)
57	Eupterotidae	Eupterotinae	<i>Eupterote</i> spp. (Hübner, 1820)
58	Gelechiidae	Dichomeridinae	<i>Helcystogramma melanocarpa</i> (Meyrick, 1929)
59	Geometridae	Ennominae	<i>Boarmiini</i> spp. (Duponchel, 1845)
60	Geometridae	Ennominae	<i>Gellonia pannularia</i> (Guenée, 1868)
61	Geometridae	Ennominae	<i>Hyperythra lutea</i> (Stoll, 1781)
62	Geometridae	Ennominae	<i>Hyposidra talaca</i> (Walker, 1860)
63	Geometridae	Geometrinae	<i>Comibaena striataria</i> (Leech, 1897)
64	Geometridae	Geometrinae	<i>Comostola laesaria</i> (Walker, 1861)
65	Geometridae	Larentiinae	<i>Eupithecia</i> spp. (Curtis, 1825)
66	Geometridae	Larentiinae	<i>Eupitheciini</i> spp. (Tutt, 1986)
67	Geometridae	Sterrhinae	<i>Scopula pulchellata</i> (Fabricius, 1794)
68	Geometridae	Sterrhinae	<i>Scopula</i> spp. (Schrank, 1802)
69	Geometridae	Sterrhinae	<i>Scopula adictaria</i> (Schrank, 1802)
70	Geometridae	Sterrhinae	<i>Traminda mundissima</i> (Walker, 1861)
71	Lasiocampidae	Lasiocampinae	<i>Gastropacha quercifolia</i> (Linnaeus, 1758)
72	Lecithoceridae	Lecithocerinae	<i>Lecithocerids</i> spp. (Merchand, 1947)
73	Lecithoceridae	Schoenobiinae	<i>Scirpophaga</i> spp. (Treitschke, 1832)

74	Limacodidae	Limacodinae	<i>Aergina hilaris</i> (Westwood, 1848)
75	Limacodidae	Limacodinae	<i>Altha subnotota</i> (Walker, 1865)
76	Limacodidae	Limacodinae	<i>Narosa conspersa</i> (Walker, 1855)
77	Noctuidae	Acontiinae	<i>Acontia marmoralis</i> (Fabricius, 1794)
78	Noctuidae	Acronictinae	<i>Tydracona obliqua</i> (Moore, 1882)
79	Noctuidae	Aediinae	<i>Aedia leucomelas complex</i> (Linnaeus, 1758)
80	Noctuidae	Agaristinae	<i>Aegocera bimacula</i> (Walker, 1854)
81	Noctuidae	Bagisarinae	<i>Chasmina spp.</i> (Walker, 1856)
82	Noctuidae	Eustrotiinae	<i>Ozarba spp.</i> (Walker, 1865)
83	Noctuidae	Hadeninae	<i>Mythimna traminea</i> (Treitschke, 1825)
84	Noctuidae	Heliothinae	<i>Helicoverpa armigera</i> (Hübner, 1808)
85	Noctuidae	Noctuinae	<i>Leucania spp.</i> (Ochsenheimer, 1816)
86	Noctuidae	Noctuinae	<i>Spodoptera litura</i> (Fabricius, 1775)
87	Noctuidae	Plusiinae	<i>Chrysodeixis eriosoma</i> (Doubleday, 1843)
88	Nolidae	Chloephorinae	<i>Nycteola revayana</i> (Scopoli, 1772)
89	Nolidae	Eriadinae	<i>Earias cupreoviridis</i> (Walker, 1862)
90	Nolidae	Nolinae	<i>Nolathripa spp.</i> (Leech, 1815)
91	Nolidae	Nolinae	<i>Nora internella</i> (Walker, 1864)
92	Notodontidae	Phalerinae	<i>Antheua servula</i> (Drury, 1773)
93	Notodontidae	Phalerinae	<i>Phalera grotei</i> (Moore, 1859)
94	Pterophoridae	Pterophorinae	<i>Lantanophaga pusillidactylus</i> (Walker, 1864)
95	Pterophoridae	Pterophorinae	<i>Pterophorides spp.</i> (Latreille, 1802)
96	Pyralidae	Galleriinae	<i>Galleria mellenolla</i> (Linnaeus, 1758)
97	Pyralidae	Phycitinae	<i>Ephestia kuehniella</i> (Zeller, 1879)
98	Pyralidae	Phycitinae	<i>Epicrocis oegnusalis</i> (Walker, 1859)
99	Pyralidae	Phycitinae	<i>Zophodia grossulariella</i> (Hübner, 1809)
100	Pyralidae	Pyralinae	<i>Pyralis pictalis</i> (Curtis, 1834)
101	Sphingidae	Macroglassinae	<i>Daphnis nerii</i> (Linnaeus, 1758)
102	Sphingidae	Sphinginae	<i>Acherontia styx</i> (Westwood, 1847)
103	Sphingidae	Sphinginae	<i>Agrius convolvuli</i> (Linnaeus, 1758)
104	Uraniidae	Microniinae	<i>Micronia aculeata</i> (Guenée, 1857)

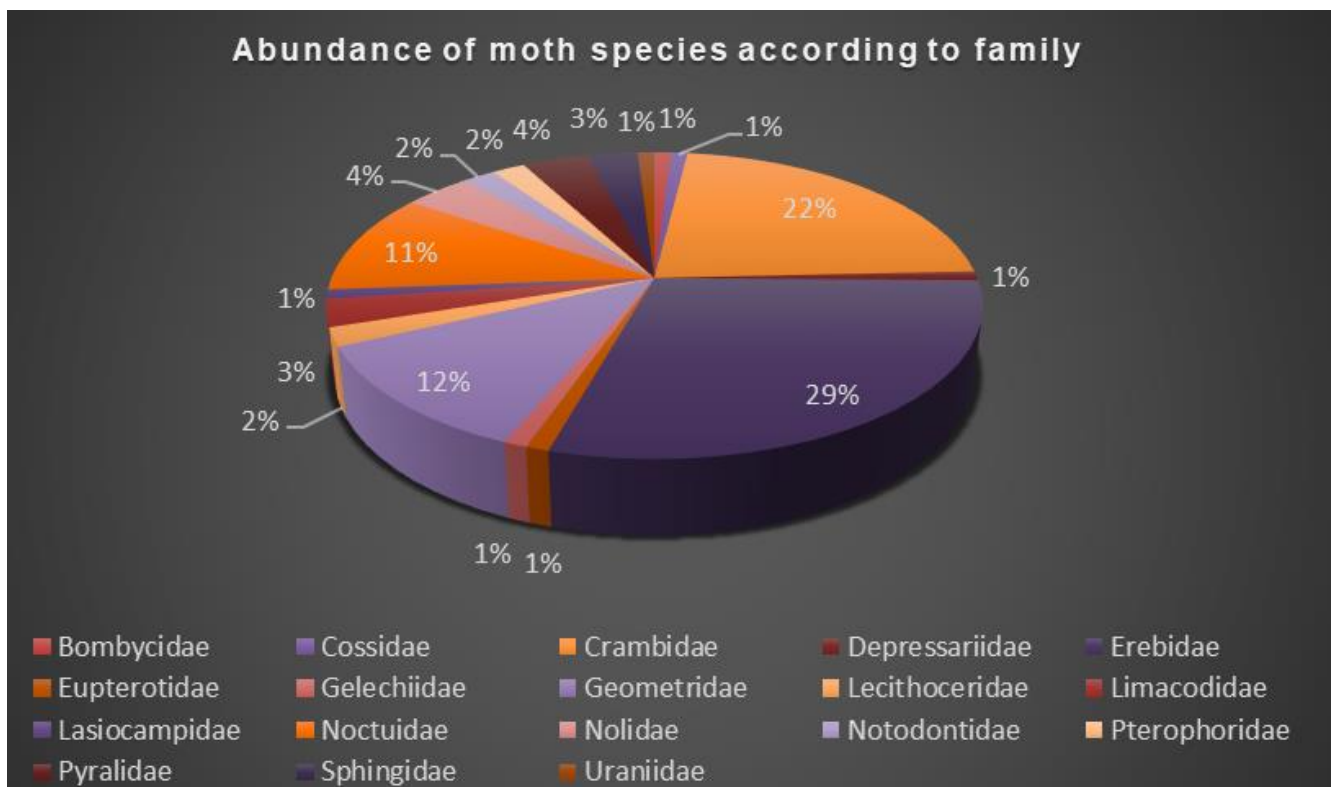
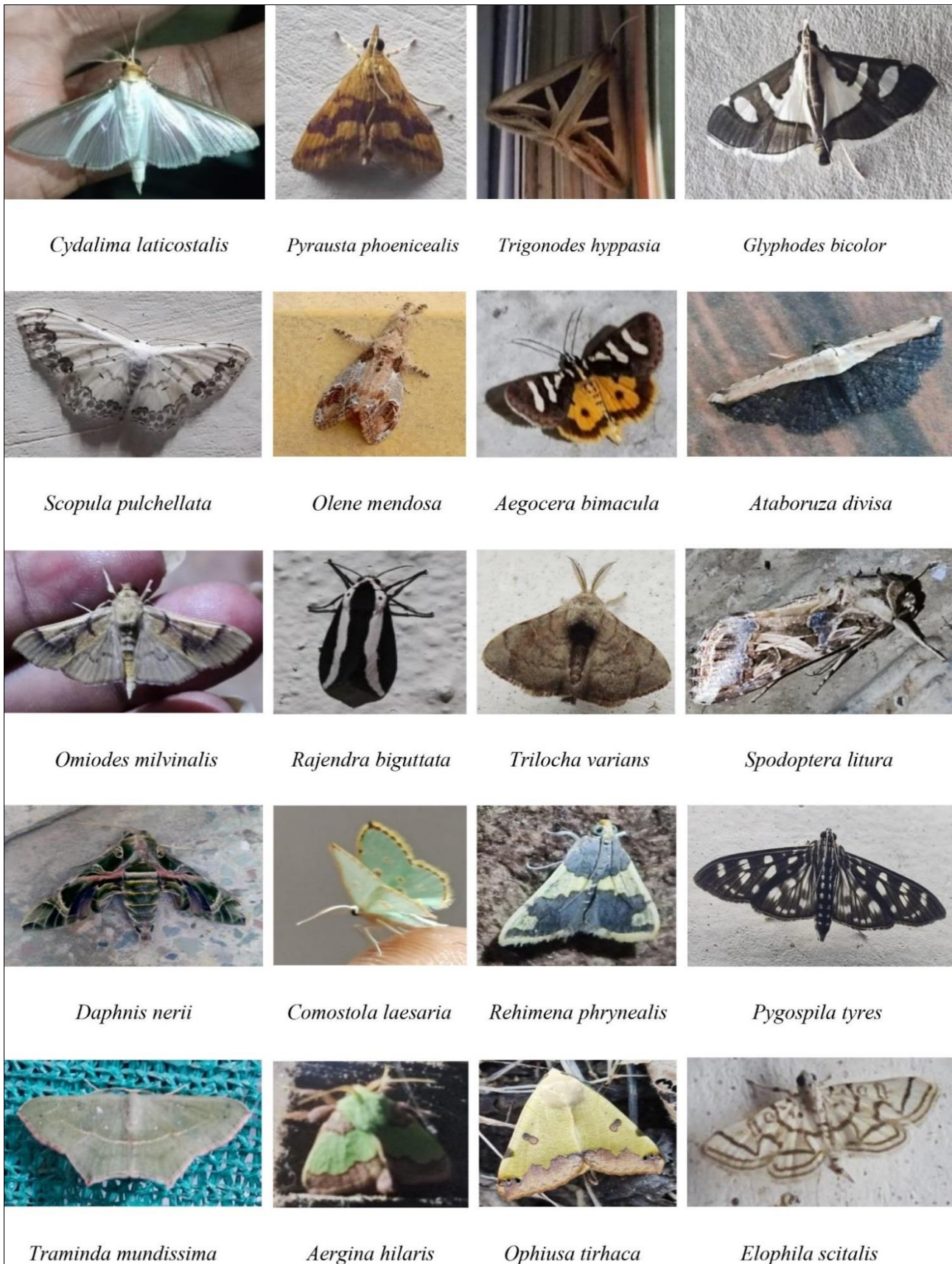


Fig 4: Percentage occurrence of different family members during study period



Photoplate 1

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