



## Diversity of moths (Lepidoptera) with new faunistic records from North East Jharkhand, India

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### Abstract

The information given in this research paper is based on 81 species representing 70 genera of moths collected during the survey conducted from October 05-08, 2016 by the first two authors. As many as 20 species are reported for the first time from Jharkhand as well as from Gangetic plains: *Bastilla joviana* (Stoll), *Erebus ephesperis* (Hubner), *Cretonotos interrupta* (Walker), *Leucania venalba* Moore, *Yepcalphis dilectissima* (Walker), *Ericia inangulata* (Guenee), *Chrysodeixis acuta* (Walker), *Agrotis segetum* D&S, *Entomogramma fautrix* Guenee, *Xanthodes albago* (Fab.), *Miaromima naessigi* (Kobes), *Scopelodes albipalpis* Hering, *Pseudoteleclita* sp., *Armiana longipennis* (Moore), *Tyspanodes linealis* (Moore), *Hyperythra lutea* (Stoll), *Cleora* sp., *Thalassodes veraria* Guenee, *Zeuzera coffeae* Nietner, *Bamra* sp.,. The area was surveyed for the first time to study the diversity of moths.

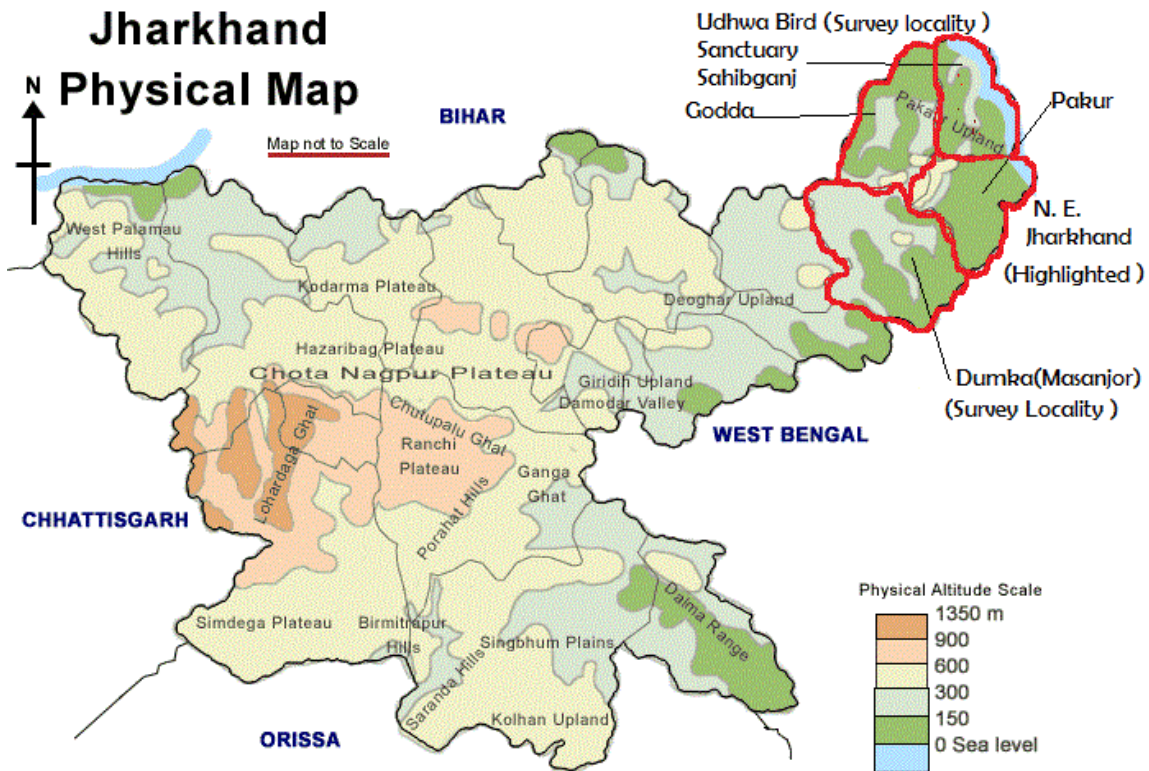
**Keywords:** Diversity, Lepidoptera, Moths, New records, North-East Jharkhand

### Introduction

Jharkhand is a state in eastern India, carved out of the southern part of Bihar on 15 November 2000. The state shares its border with the states of Bihar to the North, Uttar Pradesh and Chhattisgarh to the West, Odisha to the South, and West Bengal to the East. It is divided into 24 districts under five divisions. North-East Jharkhand comes under the Santhal Paragna division (Figure 1). Forest covers of north-east Jharkhand is 1953 km<sup>2</sup> and the vegetation varies from rich forests to sparsely covered grasslands. The main plants species of forests are Sal (*Shorea robusta*), Asan (*Terminalia tomentosa*), Dhaura (*Anogeissus latifolia*), Gamhar (*Gmelina arborea*) and Mahua (*Madhuca indica*) etc. The only protected area present in North-East Jharkhand is Udhwa Bird Sanctuary (surveyed locality) (24°58'23.02"N & 87°49'20.30"E) which also represents the only Bird

Sanctuary of the state. Udhwa bird sanctuary is situated in Sahibganj district having an area of 5.65 km<sup>2</sup>. Avian fauna of this sanctuary is Gull, Jacana, Teal, Cormorant, Dabchick, Darter, Lapwing, Plover, Wagtail, Egret, Heron, Ibis, Stork, Blue Rock Pigeon, Lark, bee-eater, Sparrow, Myna, Pipit, Brahminy, Kite, Fishing Eagle, Hawk, Vulture, Swallow, Kingfisher, Drongo, Indian Foller and Parakeet (Nigam *et al.*, 2015). Another surveyed locality is Masanjor Dam (Figure 2) which is situated in Dumka district and it is also rich in forest cover. There is hilly forest that surrounded the dam. Invertebrate fauna of this area remained unexplored so far. Therefore, a survey was undertaken to study the moth diversity of this area which reflects the presence of 81 species under 70 genera belonging to 14 different families of moths. A total of 20 species are reported for the first time from Jharkhand as well as from Gangetic plains region.

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(Courtesy: [http://deoghar.nic.in/jharkhand\\_physical\\_map.html](http://deoghar.nic.in/jharkhand_physical_map.html))  
**Figure 1.** Physical map of Jharkhand (N.E. Jharkhand Highlighted red).



**Figure 2.** A view of collection site at Masanjhor Dam (Dumka, Jharkhand).

## Material and Methods

- (i) **Study Sites:** Collection-cum-survey tour was conducted during October 05-06, 2016 (Masanjor, Dumka) and October 07-08, 2016 (Udhwa Bird Sanctuary, Sahibganj) by the first two authors. The sites selected for collection was the watching tower along the bank of Masanjor dam in Dumka and near the lake in Udhwa Bird Sanctuary in Sahibganj.
- (ii) **Collection and Preservation:** The collection of moths was made with the help of vertical sheet light trap and the collected specimens were killed with the help of ethyl acetate vapors and processed as per standard techniques in Lepidopterology. Dry preservation is done in fumigated entomological boxes and stored in the insect cabinets in the Zoological Survey of India, GPRC, Patna.
- (iii) **Identification:** The identification was done with the help of relevant literature (Hampson, 1892-1896; Haruta, 1994; Kononenko & Pinratana, 2013; Singh & Ahmad, 2017; Singh & Ranjan, 2016; Singh *et al.*, 2017, Kirti & Singh, 2015; Kirti & Singh, 2016, Singh *et al.*, 2014). The classification followed in this manuscript is based on Nieuwerkerken *et al.* (2011).

## Systematic Account

In the systematic account, name of the family, subfamily, genus and species is given. For all the included genera, the first reference is provided whereas, for each of the included species: first reference, Material examined, and photograph of adults is provided.

Family EREBIDAE

Subfamily EREBINAE

Genus *Artena* Walker

Walker, 1858; *List Specimens lepid. Insects Colln Br. Mus.*, 14: 1388.

1. *Artena dotata* (Fabricius, 1794)

*Noctua dotata* Fabricius, 1794; *Ent. Syst.* III, 2: 55.

*Material examined:* Jharkhand, Dumka, Masanjor, 05.X.2016-01 exp.

Genus *Thyas* Hubner

Hübner, 1806; *Zuträge Samml. exot. Schmett.*, 2: 4.

2. *Thyas coronata* (Fabricius, 1775)

*Noctua coronata* Fabricius, 1775; *Syst. Ent.*, 596.

*Material examined:* Jharkhand, Dumka, Masanjor, 05.X.2016-01 exp.

Genus *Ophiusa* Ochsenheimer

Ochsenheimer, 1816; *Schmett. Eur.*, 4: 93.

3. *Ophiusa tirhaca* (Cramer, [1777])

*Phalaena tirhaca* Cramer, [1777]; *Uitl. Kapellen* 2(9-16): 116.

*Material examined:* Jharkhand, Dumka, Masanjor, 05.X.2016-01 exp.

4. *Ophiusa triphaenoides* Walker, 1858

*Ophiodes triphaenoides* Walker, 1858, *List Spec. lepid. Insects Colln Br. Mus.*, 14: 1358.

*Material examined:* Jharkhand, Dumka, Masanjor, 05.X.2016-01 exp.

Genus *Parallelia* Hübner

Hübner, 1818; *Zuträge Samml. Exot. Schmett.*, 1: 15.

5. *Parallelia stuposa* (Fabricius, 1794)

*Noctua stuposa* Fabricius, 1794; *Ent. Syst.*, 3(2): 42.

*Material examined:* Jharkhand, Dumka, Masanjor, 05.X.2016-01 exp.

6. *Bastilla joviana* (Stoll, 1782)

*Noctua joviana* Stoll, 1782, *Uitlandsche Kapellen*, 4: 237.

*Material examined:* Jharkhand, Dumka, Masanjor, 05.X.2016-01 exp.

Genus *Grammodes* Guenee

Guenee, 1852; in Boisduval & Guenee, *Hist. nat. Ins., Spec. gen. Lepid.*, 7: 275.

7. *Grammodes geometrica* (Fabricius, 1775)

*Noctua geometrica* Fabricius, 1775; *Syst. Ent.*, 599.

*Material examined:* Jharkhand, Sahibganj, Udhwa BS, 07.X.2016-02 exp.

Genus *Achaea* Hübner

Hübner, 1823; *Verz. Bekannter Schmett.*, (17): 269.

8. *Achaea janata* (Linnaeus, 1758)

*Phalaena janata* Linnaeus, 1758; *Syst. Nat. Edn.* 10(1): 527.

*Material examined:* Jharkhand, Dumka, Masanjor, 06.X.2016-01 exp.

Genus *Chalciope* Hübner

Hübner, 1823; *Verz. bek. Schmett.*, (17): 268.

9. *Chalciope mygdon* (Cramer, 1777, 1779)

*Noctua mygdon* Cramer, 1777, 1779; *Uitlandsche Kapellen*, 2(9-16): 94.

*Material examined:* Jharkhand, Sahibganj, Udhwa BS, 08.X.2016-01 exp.

- Genus *Mocis* Hübner  
Hübner, [1823]; *Verz. bek. Schmett.* (17): 267.
10. *Mocis frugalis* (Fabricius, 1775)  
*Noctua frugalis* Fabricius, 1775; *Syst. Ent.*, 601.  
*Material examined*: Jharkhand, Sahibganj, Udhwa BS, 07.X.2016-01 exp.
11. *Mocis undata* (Fabricius, 1775)  
*Noctua undata* Fabricius, 1775; *Syst. Ent.*, 600.  
*Material examined*: Jharkhand, Dumka, Masanjor, 06.X.2016-01 exp, Sahibganj, Udhwa BS, 07.X.2016-01 exp.  
Genus *Erebos* Latreille  
Latreille, 1810; *Cons. Gen. Anim. Crust. Arach. Ins.*, 365.
12. *Erebos ephesperis* (Hübner, 1827)  
*Nyctipao ephesperis* Hübner, 1827, *Verz. bekannter Schmett.*, 272.  
*Material examined*: Jharkhand, Sahibganj, Udhwa BS, 07.X.2016-01 exp.  
Genus *Hamodes* Guenee  
Guenee, 1852; in Boisduval & Guenee, *Hist. nat. Ins., Spec. gen. Lepid.* 7: 202.
13. *Hamodes propitia* (Guerin-Meneville, 1831)  
*Ophiusa propitia* Guerin-Meneville, 1831; *Voy. de la Coquille*, 1830-1832: 285.  
*Material examined*: Jharkhand, Dumka, Masanjor, 06.X.2016-01 exp.  
Subfamily ARCTIINAE  
Genus *Olepa* Watson  
Watson, 1980; *The Generic Names of Moths of the World*, 2: 133.
14. *Olepa koslandana* Orhant, 1986  
*Olepa koslandana* Orhant, 1986; *Bull. Science Nat.*, 50: 12.  
*Material examined*: Jharkhand, Dumka, Masanjor, 06.X.2016-01 exp.  
Genus *Aloa* Walker  
Walker, 1855; *List Spec. Lepid. Insects Colln Br. Mus.*, 3: 699.
15. *Aloa lactinea* (Cramer, 1777)  
*Phalaena lactinea* Cramer, 1777; *Uitl. Kapellen*, 2 (9-16): 58, 149.  
*Material examined*: Jharkhand, Dumka, Masanjor, 05.X.2016-01 exp, Sahibganj, Udhwa BS, 07.10.2016-01 exp.  
Genus *Argina* Hübner  
Hübner, 1819; *Verz. bek. Schmett.* (11): 167.
16. *Argina astrea* (Drury, 1773)  
*Phalaena astrea* Drury, 1773; *Illust. Nat. Hist. Exot. Insects*, 2: 11.  
*Material examined*: Jharkhand, Dumka, Masanjor, 05.X.2016-03 exp, Sahibganj, Udhwa BS, 07.10.2016-01 exp.  
Genus *Lemyra* Walker  
Walker, 1856; *List Spec. Lepid. Insects Colln Br. Mus.*, 7: 1690.
17. *Lemyra* sp.  
*Material examined*: Jharkhand, Sahibganj, Udhwa BS, 07.10.2016-01 exp.  
Genus *Amerila* Walker  
Walker, 1855; *List spec. Lep. Ins. Colln. Br. Mus.*, 3: 725.
18. *Amerila astreus* (Drury, 1773)  
*Spinix astreus* Drury, 1773; *III. Nat. Hist. Exot. Insect*, 2: 185.  
*Material examined*: Jharkhand, Dumka, Masanjor, 05.X.2016-03 exp.  
Genus *Rajendra* Moore  
Moore, 1879; *Descr. Indian lep. Atkinson*, (1): 43.
19. *Rajendra biguttata* (Walker, 1855)  
*Aloa biguttata* Walker, 1855; *List Spec. Lepid. Insects Colln Br. Mus.*, 3: 707.  
*Material examined*: Jharkhand, Dumka, Masanjor, 05.X.2016-01 exp.  
Genus *Creatonotos* Hübner  
Hübner, 1819; *Verz. bek. Schmett.*, (11): 170.
20. *Creatonotos transiens* (Walker, 1855)  
*Spilosoma transiens* Walker, 1855; *List Spec. Lepid. Insects Colln Br. Mus.*, 3: 675.  
*Material examined*: Jharkhand, Dumka, Masanjor, 06.X.2016-01 exp, Sahibganj, Udhwa BS, 07.X.2016-04 exp.
21. *Creatonotos interrupta* (Linnaeus, 1767)  
*Phalaena (Noctua) interrupta* Linnaeus, 1767; *Syst. Nat.*, 1 (2): 840.  
*Material examined*: Jharkhand, Dumka, Masanjor, 05.X.2016-04 exp, 06.X.2016-03 exp, Sahibganj, Udhwa BS, 08.X.2016-04 exp.  
Genus *Aemene* Walker  
Walker, 1855; *List Spec. Lepid. Insects Colln. Br. Mus.*, 2: 541.
22. *Aemene nilgirica* Hampson, 1891  
*Aemene nilgirica* Hampson, 1891, *Ill. Het.*, 8: 51.  
*Material examined*: Jharkhand, Dumka, Masanjor, 05.X.2016-01 exp.

- Genus *Syntomoides* Hampson  
Hampson, 1893 1892; *Fauna Br. India* (Moths), **1**: 209.
23. *Syntomoides imaon* (Cramer, 1779)  
*Sphinx imaon* Cramer, 1779; *Utl. Kapellen*, **3**: 94.  
*Material examined*: Jharkhand, Sahibganj, Udhwa BS, 05.X.2016-01 exp.  
Genus *Nepita* Moore  
Moore, 1860; *Cat. lep. Ins. Mus. Nat. Hist.*, **2**: 302.
24. *Nepita conferta* (Walker, 1854)  
*Pitane conferta* Walker, 1854; *List Spec. Lepid. Insects Colln Br. Mus.*, **2**: 533.  
*Material examined*: Jharkhand, Dumka, Masanjour, 05.X.2016-01 exp.  
Genus *Brunia* Moore  
Moore, 1878; *Proc. zool. Soc. Lond.*, 1878: 15.
25. *Brunia antica* (Walker, 1854)  
*Lithosia antica* Walker, 1854; *List Spec. Lepid. Insects Colln Br. Mus.*, **2**: 505.  
*Material examined*: Jharkhand, Dumka, Masanjour, 05.X.2016-01 exp.  
Subfamily LYMANTRIINAE  
Genus *Lymantria* Hübner  
Hübner 1819; *Verz. bek. Schmett.*, (**10**): 160.
26. *Lymantria marginata* Walker, 1855  
*Lymantria marginata* Walker, 1855; *List Spec. Lepid. Insects Colln Br. Mus.*, **4**: 877.  
*Material examined*: Jharkhand, Sahibganj, Udhwa BS, 07.X.2016-01 exp.  
Genus *Aroa* Walker  
Walker, 1855; *List Spec. Lepid. Insects Colln Br. Mus.*, **4**: 780.
27. *Aroa* sp.  
*Material examined*: Jharkhand, Dumka, Masanjour, 06.X.2016-01 exp.  
Subfamily SCOLIOPTERYGINAE  
Genus *Anomis* Hübner  
Hübner, 1821; *Verz. bek. Schmett.*, (**16**): 249.
28. *Anomis flava* (Fabricius, 1775)  
*Noctua flava* Fabricius, 1775; *Syst. Ent.*, **1775**: 601.  
*Material examined*: Jharkhand, Dumka, Masanjour, 05.X.2016-01 exp.  
Genus *Rusicada* (Walker)  
Hübner, 1821; *Verz. bek. Schmett.* (**16**): 249.
29. *Rusicada pindraberensis* Singh & Ranjan, 2016  
*Rusicada pindraberensis* Singh & Ranjan, 2016; *Rec. Zool. Surv. India*: **116**(4): 323-336.  
*Material examined*: Jharkhand, Dumka, Masanjour, 05.X.2016-01 exp.  
Subfamily CALPINAE  
Genus *Hypocala* Guenee  
Guenee, 1852; in Boisduval & Guenee, *Hist. nat. Ins., Spec. gen. Lepid.*, **7**: 73.
30. *Hypocala deflorata* Fabricius, 1794  
*Hypocala deflorata* Fabricius, 1794, *Ent. Syst.*, **3**(2): 127.  
*Material examined*: Jharkhand, Dumka, Masanjour, 05.X.2016-01 exp.  
Subfamily AGANAINAE  
Genus *Asota* Hübner  
Hübner, 1819; *Verz. bek. Schmett.* (**11**): 164
31. *Asota caricae* (Fabricius, 1775)  
*Noctua caricae* Fabricius, 1775; *Syst. Ent.*, 596.  
*Material examined*: Jharkhand, Dumka, Masanjour, 06.10.2016-01 exp, Udhwa BS, 07.X.2016-01 exp, 08.X.2016-01 exp.  
Subfamily PANGRAPTINAE  
Genus *Episparis* Walker  
Walker, 1857; *List Spec. Lepid. Insects Colln Br. Mus.*, **10**: 475.
32. *Episparis liturata* (Fabricius, 1787)  
*Phalaena liturata* Fabricius, 1787; *Mant. Ins.*, **2**: 197.  
*Material examined*: Jharkhand, Dumka, Masanjour, 05.X.2016-01 exp, 06.X.2016-01 exp.  
Subfamily HADENINAE  
Genus *Mythimna* Ochsenheimer  
Ochsenheimer, 1816; *Schmett. Eur.*, **4**: 78.
33. *Mythimna yu* (Guenee, 1852)  
*Leucania yu* Guenee, 1852; *Hist. nat. Insectes, Spec. gen. Lepid.*, **5**: 78.  
*Material examined*: Jharkhand, Dumka, Masanjour, 05.X.2016-02 exp, Udhwa BS, 08.X.2016-01 exp.
34. *Leucania* sp.  
*Material examined*: Jharkhand, Sahibganj, Udhwa BS, 08.X.2016-01 exp.
35. *Leucania venalba* Moore, 1867  
*Leucania venalba* Moore, 1867; *Proc. zool. Soc. Lond.*, **1867**: 48.  
*Material examined*: Jharkhand, Sahibganj, Udhwa BS, 08.X.2016-01 exp.  
Genus *Spodoptera* Guenee  
Guenee 1852; in Boisduval & Guenee, *Hist. nat. Ins., Spec. gen. Lepid.*, **5**: 153.

36. ***Spodoptera litura*** (Fabricius, 1775)  
*Noctua litura* Fabricius, 1775; *Syst. Ent.*, 601.  
 Material examined: Jharkhand, Dumka, Masanjor, 05.X.2016-01 exp, Udhwa BS, 07.X.2016-01 exp.
37. ***Spodoptera mauritia*** (Boisduval, 1833)  
*Hadena mauritia* Boisduval, 1833, *Nouv. Annl. Mus. Hist. nat.*, 2: 240.  
 Material examined: Jharkhand, Dumka, Masanjor, 06.X.2016-01 exp.  
 Genus ***Yepcalphis*** Nye  
 Nye, 1975; *Gen. Names Moths World*, 1: 508.
38. ***Yepcalphis dilectissima*** (Walker, 1858)  
*Ariola dilectissima* Walker, 1858; *List Spec. Lepid. Insects Colln Br. Mus.*, 15: 1751.  
 Material examined: Jharkhand, Sahibganj, Udhwa BS, 07.X.2016-01 exp.  
 Family LASIOCAMPIDAE  
 Subfamily GASTROPACHINAE  
 Genus ***Gastropacha*** Ochseneheimer  
 Ochseneheimer, 1810; *schmett. Eur.*, 3: 239.
39. ***Gastropacha pardale*** (Walker, 1855)  
*Megasoma pardale* Walker, 1855; *List Spec. Lep. Insec. Br. Mus.*, 6: 1453.  
 Material examined: Jharkhand, Sahibganj, Udhwa BS, 08.X.2016-01 exp.  
 Family NOCTUIDAE  
 Subfamily HELIOTHINAE  
 Genus ***Helicoverpa*** Hardwick  
 Hardwick, 1965; *Mem. ent. Soc. Canada*, 40: 9.
40. ***Helicoverpa assulta*** (Guenee, 1852)  
*Heliolithis assulta* Guenee, 1852; *Hist. nat. Ins., Spec. gen. Lepid.*, 6(2): 178.  
 Material examined: Jharkhand, Dumka, Masanjor, 05.X.2016-01 exp.  
 Subfamily BAGISARINAE  
 Genus ***Chasmina*** Walker  
 Walker, 1856; *List Spec. Lepid. Insects Colln Br. Mus.*, 9: 69.
41. ***Chasmina* sp.**  
 Material examined: Jharkhand, Dumka, Masanjor, 05.X.2016-01 exp, 06.X.2016-01 exp.  
 Subfamily CALPINAE  
 Genus ***Ericcia*** Walker  
 Walker, 1858; *List Spec. Lepid. Insects Colln Br. Mus.*, 13: 1078.
42. ***Ericcia inangulata*** (Guenee, 1852)  
*Hulodes inangulata* Guenee, 1852, *Hist. Nat. Insectes, Spec. gen. Lepid.*, 7: 210.  
 Material examined: Jharkhand, Dumka, Masanjor, 05.X.2016-02 exp.  
 Subfamily PLUSIINAE  
 Genus ***Chrysodeixis*** Hübner  
 Hübner, 1821; *Verz. bek. Schmett.*, (16): 252.
43. ***Chrysodeixis acuta*** (Walker, 1858)  
*Plusia acuta* Walker, 1858; *List Spec. Lepid. Insects Colln Br. Mus.*, 12: 922.  
 Material examined: Jharkhand, Sahibganj, Udhwa BS, 08.X.2016-01 exp.  
 Genus ***Thysanoplusia*** Ichinose  
 Ichinose, 1973; *Kontyu*, 41 (2): 137.
44. ***Thysanoplusia (Daubeiplusia) lectula*** (Walker, 1858)  
*Prodenia lectula* Walker, 1858; *List Spec. Lepid. Insects Colln Br. Mus.*, 15: 1679.  
 Material examined: Jharkhand, Sahibganj, Udhwa BS, 08.X.2016-01 exp.  
 Subfamily NOCTUINAE  
 Genus ***Agrotis*** Ochseneheimer  
 Ochseneheimer, 1816; *Schmett. Eur.*, 4: 66.
45. ***Agrotis segetum*** (Denis & Schiffermüller, 1775)  
*Noctua segetum* Denis & Schiffermüller, 1775; *Ank. syst. Schmett. Wienergegend*, 81.  
 Material examined: Jharkhand, Sahibganj, Udhwa BS, 07.X.2016-01 exp.  
 Subfamily CATOCALINAE  
 Genus ***Entomogramma*** Guenee  
 Guenee, 1852; *Hist. nat. Ins., Spec. gen. Lepid.*, 7(3): 203.
46. ***Entomogramma faultrix*** Guenee, 1852  
*Entomogramma faultrix* Guenee, 1852; *Hist. nat. Ins., Spec. gen. Lepid.*, 7(3): 204.  
 Material examined: Jharkhand, Dumka, Masanjor, 05.X.2016-01 exp.  
 Genus ***Bamra*** Moore  
 Moore, 1882; *Descr. Indian lep. Atkinson*, (2): 159.
47. ***Bamra* sp.**  
 Material examined: Jharkhand, Dumka, Masanjor, 05.X.2016-01 exp.  
 Family NOLIDAE  
 Subfamily EARIADINAE  
 Genus ***Earias*** Hübner  
 Hübner, 1825; *Verz. Bekannt. Schmett*, 395.
48. ***Earias luteolaria*** Hampson, 1891  
*Earias luteolaria* Hampson, 1891; *Illust. typical Spec. Lepid. Het. Br. Mus.*, 8:46.

- Material examined:* Jharkhand, Sahibganj, Udhwa BS, 08.X.2016-01 exp.  
Subfamily CHLOEPHORINAE  
Genus *Xanthodes* Guenee  
Guenee, 1852; in Boisduval & Guenee, *Hist. nat. Ins., Spec. gen. Lepid.*, **6**: 209.
49. *Xanthodes transversa* Guenee, 1852  
*Xanthodes transversa* Guenee, 1852; Boisduval & Guenee, *Hist. nat. Ins., Spec. gen. Lepid.*, **6**: 209.  
*Material examined:* Jharkhand, Dumka, Masanjanor, 05.X.2016-01 exp.
50. *Xanthodes albago* (Fabricius, 1794)  
*Noctua albago* Fabricius, 1794; *Ento. Syst.*, **3**(2): 74.  
*Material examined:* Jharkhand, Dumka, Masanjanor, 06.X.2016-01 exp.  
Genus *Carea* Walker  
Walker, 1857; *List Spec. Lepid. Insects Colln. Br. Mus.*, **10**: 474.
51. *Carea angulata* (Fabricius, 1793)  
*Bombyx angulata* Fabricius, 1793; *Ent. Syst.*, **3**(1): 481.  
*Material examined:* Jharkhand, Dumka, Masanjanor, 05.X.2016-01 exp.  
Subfamily WESTERMANNIINAE  
Genus *Miaromima* Meyrick  
Meyrick, 1889; *Trans. R. ent. Soc. Lond.*, **1889**: 471.
52. *Miaromima naessigi* (Kobes, 1989)  
*Westermannia naessigi* Kobes, 1989; *Heterocera Sumatrana*, **2**(7): 156.  
*Material examined:* Jharkhand, Dumka, Masanjanor, 05.X.2016-01 exp.  
Family SPHINGIDAE  
Subfamily MACROGLOSSINAE  
Genus *Theretra* Hübner  
Hübner, 1819; *Verz. Bek. Schmett.*, (9): 135.
53. *Theretra nessus* (Drury, 1773)  
*Sphinx nessus* Drury, 1773; *Illustr. Ex. Ins.*, **2**: 46.  
*Material examined:* Jharkhand, Sahibganj, Udhwa BS, 07.X.2016-01 exp.
54. *Theretra oldenlandiae* (Fabricius, 1775)  
*Sphinx oldenlandiae* Fabricius, 1775; *Syst. Ent.*, 542.  
*Material examined:* Jharkhand, Sahibganj, Udhwa BS, 07.X.2016-02 exp, Dumka, Masanjanor, 05.X.2016-01 exp.
55. *Theretra alecto* (Linnaeus, 1758)  
*Sphinx alecto* Linnaeus, 1758, *Syst. Nat.*, **10**: 492.  
*Material examined:* Jharkhand, Dumka, Masanjanor, 06.X.2016-01 exp, Sahibganj, Udhwa BS, 05.X.2016-01 exp.
56. *Theretra clotho* (Drury, 1773)  
*Sphinx clotho* Drury, 1773, *Illustr. Ex. Ins.*, **2**: 48.  
*Material examined:* Jharkhand, Sahibganj, Udhwa BS, 07.X.2016-01 exp, Dumka, Masanjanor, 05.X.2016-02 exp.  
Genus *Acosmeryx* Boisduval  
Boisduval, [1875]; *Hist. nat. Ins., Spec. gen. Lepid. Het.*, **1**: 214.
57. *Acomeryx* sp.  
*Material examined:* Jharkhand, Sahibganj, Udhwa BS, 07.X.2016-01 exp.  
Genus *Pergesa* Walker  
Walker, 1856; *List Spec. Lepid. Insects Colln. Br. Mus.*, **8**: 149.
58. *Pergesa acteus* (Cramer, 1779)  
*Sphinx acteus* Cramer, 1779; *Uitl. Kapellen*, **3** (17-21): 93.  
*Material examined:* Jharkhand, Dumka, Masanjanor, 06.X.2016-01 exp.  
Subfamily SPHINGINAE  
Genus *Agrius* Hubner  
Hübner, 1819; *Verz. bek. Schmett.*, (9): 140.
59. *Agrius convolvuli* (Linnaeus, 1758)  
*Sphinx convolvuli* Linnaeus, 1758; *Syst. Nat.*, **1**: 435.  
*Material examined:* Jharkhand, Dumka, Masanjanor, 05.X.2016-01 exp.  
Family LIMACODIDAE  
Subfamily LIMACODINAE  
Genus *Cheromettia* Moore  
Moore, 1883; *Lepid. Ceylon*, **2**: 133.
60. *Cheromettia laleana* (Moore, 1859)  
*Parasa laleana* Moore, 1859; *Ann. Mag. Nat. Hist.*, **20**(4):417.  
*Material examined:* Jharkhand, Dumka, Masanjanor, 05.X.2016-01 exp.  
Genus *Scopelodes* Westwood  
Westwood, 1841; in Jardine, *Naturalist's Libr.*, **33**(7): 222.
61. *Scopelodes albipalpalis* Hering 1931  
*Scopelodes albipalpalis* Hering, 1931; In A. Seitz (ed.), *Die Gross-Sch.der Erde.*, **10**: 689.  
*Material examined:* Jharkhand, Dumka, Masanjanor, 05.X.2016-01 exp.  
Family EUPTEROTIDAE  
Subfamily EUPTEROTINAE  
Genus *Eupterote* Hübner  
Hübner 1820; *Verz. bek. Schmett.* (12): 187.

- 62. *Eupterote geminata*** (Walker, 1855)  
*Dreata geminata* Walker, 1855; *List Spec. Lepid. Insects Colln Br. Mus.*, **4**: 907.  
 Material examined: Jharkhand, Sahibganj, Udhwa BS, 07.X.2016-01 exp.  
 Family NOTODONTIDAE  
 Subfamily Unassigned  
 Genus *Pseudoteleclita* Kiriakoff  
 Kiriakoff, 1968; in Wytzman, *Genera Insectorum*, **217** (C): 219.
- 63. *Pseudoteleclita* sp.**  
 Material examined: Jharkhand, Dumka, Masanjor, 06.X.2016-01 exp.  
 Subfamily PYGAERINAE  
 Genus *Allata*  
 Walker, 1862, *J. Linn. Soc. Lond. Zool.* **6**: 140.
- 64. *Allata argentifera*** Walker, 1862  
*Allata argentifera* Walker, 1862; *J. Proc. Linn. Soc. Zool.*, **6**: 140.  
 Material examined: Jharkhand, Sahibganj, Udhwa BS, 07.X.2016-01 exp.  
 Subfamily BIRETINAE  
 Genus *Armiana* Walker  
 Walker, 1862; *J. Proc. Linn. Soc. Zool.*, **6**: 141.
- 65. *Armiana longipennis*** (Moore, 1881)  
*Norraca longipennis* Moore, 1881; *Proc. Zool. Soc. Lond.*, **1881**: 340.  
 Material examined: Jharkhand, Sahibganj, Udhwa BS, 08.X.2016-01 exp.  
 Subfamily CERURINAE  
 Genus *Paracerura* Schintlmeister  
 Schintlmeister, 2002; *Nachr. Ent. Ver. Apollo*, **23** (3).
- 66. *Paracerura* sp.**  
 Material examined: Jharkhand, Dumka, Masanjor, 05.X.2016-02 exp, 06.X.2016-01 exp.  
 Subfamily PHALERINAE  
 Genus *Antheua* Walker  
 Walker, 1855; *List Spec. Lepid. Insects Colln Br. Mus.*, **3**: 687.
- 67. *Antheua servula*** (Drury, 1773)  
*Noctua servula* Drury, 1773; *Illust. Exot. Ento.*, **2**: 23.  
 Material examined: Jharkhand, Dumka, Masanjor, 05.X.2016-01 exp, Sahibganj, Udhwa BS, 07.X.2016-01 exp.  
 Subfamily PTILODONINAE  
 Genus *Hexafrenum* Matsumura  
 Matsumura, 1925; *Zool. Mag. Tokyo*, **37**: 400.
- 68. *Hexafrenum* sp.**  
 Material examined: Jharkhand, Dumka, Masanjor, 05.X.2016-01 exp.  
 Family SATURNIIDAE  
 Subfamily SATURNIINAE  
 Genus *Antheraea* Hübner  
 Hübner, 1819; *Verz. bek. Schmett.*, **10**: 152.
- 69. *Antheraea mylitta*** (Drury, 1773)  
*Phalaena mylitta* Drury, 1773; *Illust. Nat. Hist. Exot. Insects*, **2**: 8.  
 Material examined: Jharkhand, Sahibganj, Udhwa BS, 07.X.2016-01 exp.  
 Family BOMBYCIDAE  
 Subfamily BOMBYCINAE  
 Genus *Bombyx* Linnaeus  
 Linnaeus, 1758; *Syst. Nat.*, **1**: 495.
- 70. *Bombyx incomposita*** (van Eecke, 1929)  
*Theophila incomposita* van Eecke, 1929, *Zool. Meded. Leiden*, **12**: 65.  
 Material examined: Jharkhand, Sahibganj, Udhwa BS, 07.X.2016-01 exp.  
 Family CRAMBIDAE  
 Subfamily PYRAUSTINAE  
 Genus *Botyodes* Guenee  
 Guenee, 1854; in Boisduval & Guenee, *Hist. Nat. Ins. Spec. Gen. Lepid.*, **8**: 320.
- 71. *Botyodes caldusalis*** (Walker, 1859)  
*Botys caldusalis* Walker, 1859; *List Spec. Lepid. Insects Colln Br. Mus.*, **18**: 650.  
 Material examined: Jharkhand, Dumka, Masanjor, 05.X.2016-01 exp.  
 Genus *Cydalima* Lederer  
 Lederer, 1863; *Beitr. Kenn. Der Pyral.*, 397.
- 72. *Cydalima laticostalis*** (Guenee, 1854)  
*Margarodes laticostalis* Guenee, 1854; in Boisd. & Guenee, *Hist. Nat. Ins. Sp. Gen. Lep.*, **8**: 303.  
 Material examined: Jharkhand, Dumka, Masanjor, 06.X.2016-01 exp.  
 Genus *Tyspanodes* Warren  
 Warren, 1891; *Ann. Mag. Nat. Hist.*, **7**: 425.
- 73. *Tyspanodes linealis*** (Moore, 1868)  
*Propachys linealis* Moore, [1868]; *Proc. zool. Soc. Lond.*, **1867**: 665.  
 Material examined: Jharkhand, Sahibganj, Udhwa BS, 08.X.2016-01 exp.  
 Family GEOMETRIDAE  
 Subfamily ENNOMINAE



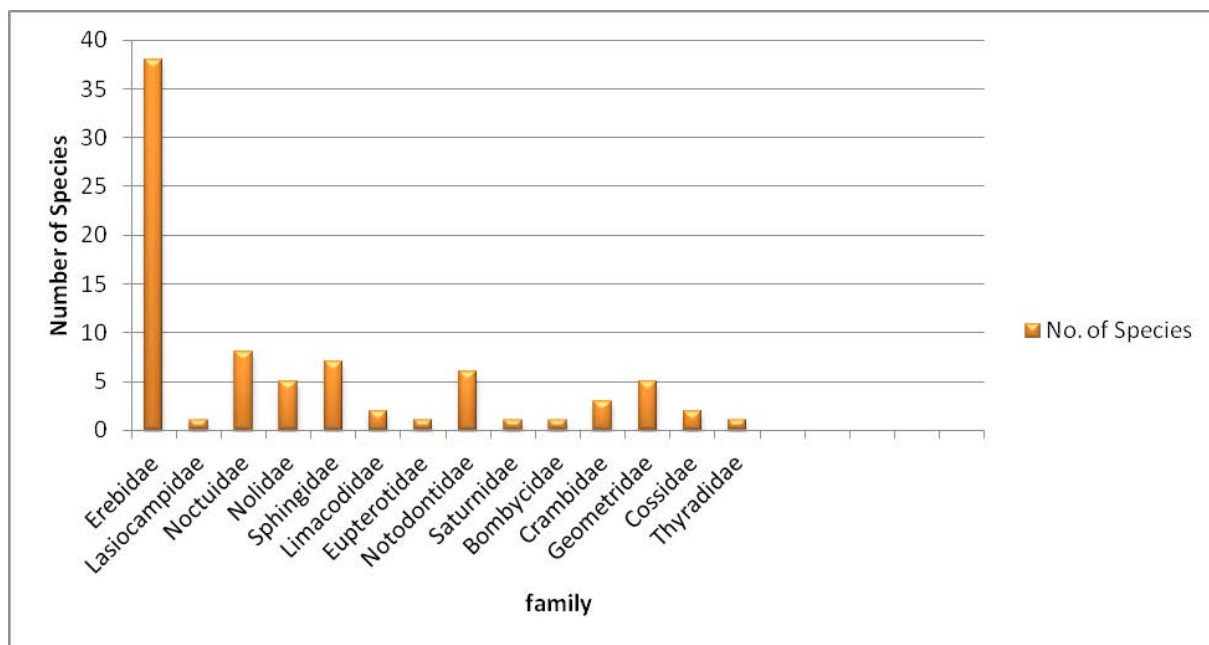
- Genus *Hyperythra* Guenee  
Guenee, 1857; *Hist. nat. Ins., Spec. gen. Lepid.*, **9**: 99.
74. *Hyperythra lutea* (Stoll, [1781])  
*Phalaena lutea* Stoll, 1781; in Cramer, *Uitl. Kapellen*, **4** (29-31): 157.  
*Material examined*: Jharkhand, Dumka, Masanjor, 06.X.2016-01 exp.  
Genus *Hyposidra* Guenee  
Guenee, 1857; *Hist. nat. Ins., Spec. gen. Lepid.*, **10**: 150.
75. *Hyposidra talaca* (Walker, 1860)  
*Lagryra talaca* Walker, 1860; *List Spec. Lepid. Insects Colln Br. Mus.*, **20**: 59.  
*Material examined*: Jharkhand, Sahibganj, Udhwa BS, 07.X.2016-01 exp.  
Genus *Chiasmia* Hübner  
Hübner 1823; *Verz. Bek. Schmett.*, **19**: 295.
76. *Chiasmia xanthonora* (Walker, 1861)  
*Macaria xanthonora* Walker, 1861; *List Spec. Lepid. Insects Colln Br. Mus.*, **23**: 935.  
*Material examined*: Jharkhand, Dumka, Masanjor, 06.X.2016-01 exp.  
Genus *Cleora* Curtis  
Curtis, 1825; *British Entomology*, **2**: 88.
77. *Cleora* sp.  
*Material examined*: Jharkhand, Sahibganj, Udhwa BS, 08.X.2016-01 exp.  
Subfamily GEOMETRINAE  
Genus *Thalassodes* Guenee, 1857  
Guenee, 1857; in Boisduval & Guenee, *Hist. nat. Ins.*, **9**: 359.
78. *Thalassodes veraria* Guenee, 1857  
*Thalassodes veraria* Guenee, 1857; *Hist. Nat. Ins.*, **9** (9): 360-361.  
*Material examined*: Jharkhand, Sahibganj, Udhwa BS, 07.X.2016-01 exp.  
Family COSSIDAE  
Subfamily ZEUZERINAE  
Genus *Xyleutes* Hübner  
Hübner, 1820; *Verz. bek. Schmett.*, (13): 195.
79. *Xyleutes persona* (Le Guillou, 1841)  
*Cossus persona* le Guillou, 1841, *Rev. Zool.*, **4**: 257.  
*Material examined*: Jharkhand, Dumka, Masanjor, 06.X.2016-01 exp.  
Genus *Zeuzera* Latreille  
Latreille, 1804; *Nouv. Dict. Hist. Nat.*, **24**: 186.
80. *Zeuzera coffeae* Nietner, 1861  
*Zeuzera coffeae* Nietner, 1861, *Enemies of Coffee Tree*, 21.  
*Material examined*: Jharkhand, Sahibganj, Udhwa BS, 07.X.2016-01 exp.  
Family THYRADIDAE  
Subfamily STRIGLININAE  
Genus *Striglina* Guenee  
Guenee, 1877, *Ann. Soc. Ent. Fr.*, **1877**: 283.
81. *Striglina scitaria* (Walker, 1862)  
*Drepanodes scitaria* Walker, 1862; *List Spec. Lepid. Insects Colln Br. Mus.*, **26**: 1488-1489.  
*Material examined*: Jharkhand, Sahibganj, Udhwa BS, 08.X.2016-01 exp. (Photograph of adult not provided here)

## Results and Discussion

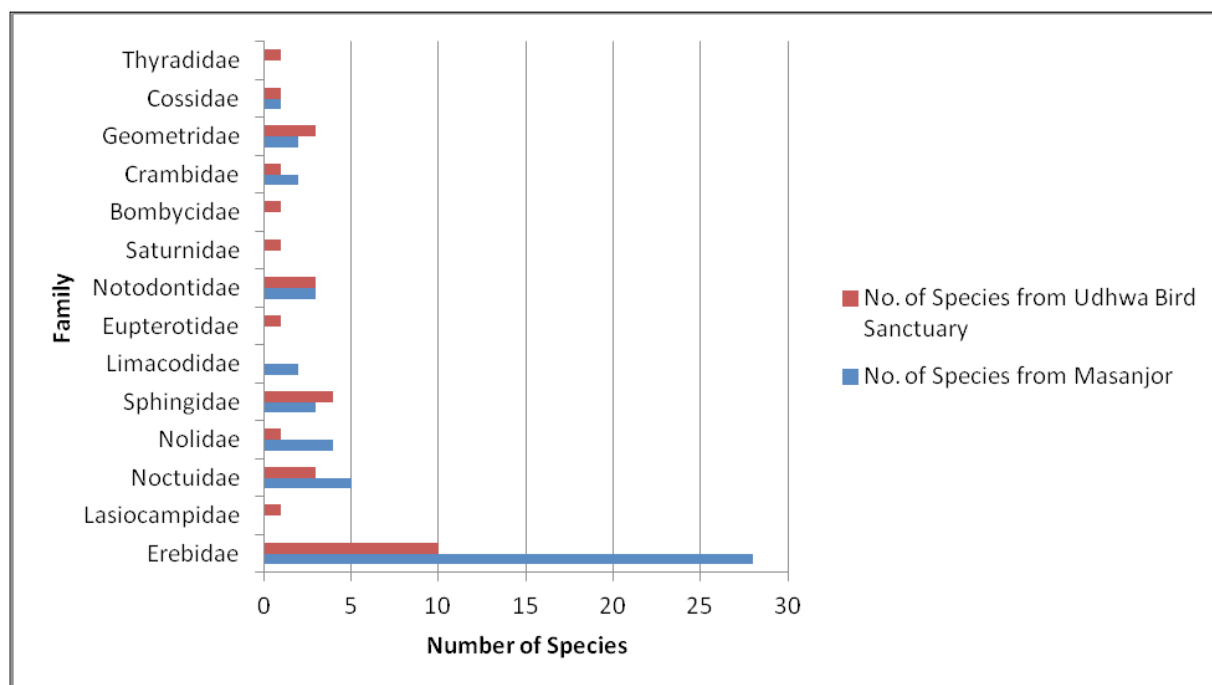
In the present study, an Inventory of moths from North-East Jharkhand is given on the basis of data collected during the survey tour conducted in this region. A total number of 119 examples of adult moths were collected and identified under 81 different species and 70 genera representing 14 families. Maximum diversity of species within the area is of family Erebidae which accounts for about 46% of the total collected species whereas family Lasiocampidae, Eupterotidae, Bombycidae, Saturniidae and Thyradidae are represented by single species and represents the least diversity from the study area (Graph 1). Moreover, out of the two collection sites, Masanjor has more diversity than Udhwa bird sanctuary (Graph 2). The major outcome of this work is the reporting of 20 species: *Bastilla joviana* (Stoll), *Erebus ephesperis* (Hubner), *Cretonotos interrupta* (Walker), *Leucania venalba* Moore, *Yepcalphis dilectissima* (Walker), *Ericeia inangulata* (Guenee), *Chrysodeixis acuta* (Walker), *Agrotis segetum* D&S, *Entomogramma faultrix* Guenee, *Xanthodes albago* (Fab.), *Miaromima naessigi* (Kobes), *Scopelodes albipalpis* Hering, *Pseudoteleclita* sp., *Armiana longipennis* (Moore), *Tyspanodes linealis* (Moore), *Hyperythra lutea* (Stoll), *Cleora* sp., *Thalassodes veraria* Guenee, *Zeuzera coffeae* Nietner, *Bamra* sp., for the first time from Jharkhand state as well as from the Gangetic Plains. Out of the six districts, only two were covered in this survey. More faunistic surveys are needed in the area so that a complete moth fauna from North-East Jharkhand can be compiled. The present data will provide a baseline to study diversity of moths from North-East Jharkhand. These new records as well as the reporting of other moth species will help to plan

conservation strategies and management plans for the North-East Jharkhand. Many of the species documented above act as severe pests of different crops and these

findings will help the agricultural scientist to suggest suitable pest control measures for associated crops of this region.



Graph 1. Diversity of families from NE Jharkhand.



Graph 2. Comparative distribution of Species from both collection sites.

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## References

- Hampson, G.F. 1892. *The Fauna of British India including Ceylon and Burma*. Moths, Vol. I. Taylor and Francis Ltd., London, 527 pp.
- Hampson, G.F. 1894. *The Fauna of British India including Ceylon and Burma*. Moths, Vol. II. Taylor and Francis Ltd., London, 609 pp.
- Hampson, G.F. 1895. *The Fauna of British India including Ceylon and Burma*. Moths, Vol. III. Taylor and Francis Ltd., London, 546 pp.
- Hampson, G.F. 1896. *The Fauna of British India including Ceylon and Burma*. Moths, Vol. IV. Taylor and Francis Ltd., London, 594 pp.
- Haruta, T. (ed.) 1994. *Noctuidae: Catocalinae and Ophiderinae*. In, Haruta, T. (ed.) Moths of Nepal, part 3 Tinea, **14**(Suppl. 2): 140-153
- Kononenko, V.S. and Pinratana, A. 2013. Moth of Thailand Vol. 3, Part 2. Noctuoidea. An illustrated Catalogue of Erebidae, Nolidae, Euteliidae and Noctuidae (Insecta, Lepidoptera) in Thailand. Brothers of St. Gabriel in Thailand. Bangkok. 2013. 625 pp.
- Kirti, J.S., and Singh, N., 2015. *Arctiid Moths of India* Vol. I: 1-205 (Published by: Nature Books India, 6 Gandhi Market, Minto Raod, New Delhi-110002).
- Kirti, J.S., and Singh, N., 2016. *Arctiid Moths of India*, Vol. II: 1-214 (Published by: Nature Books India, 6 Gandhi Market, Minto Raod, New Delhi-110002).
- Nieukerken EJV, Kaila L, Kitching IJ, Kristensen NP, Lees DC, Minet J *et al.* 2011. *Order Lepidoptera Linnaeus, (1758)*. In: Zhang, Z.-Q. (Ed.), *Animal Biodiversity: An Outline of Higher-Level Classification and Survey of Taxonomic Richness*, *Zootaxa*, **3148**: 212-221.
- Nigam, B.C., Kumar, D. and Kumar, S. 2016. A Window to the Biodiversity of Jharkhand. Department of Forests Environment & Climate Change, Government of Jharkhand. 171 pp.
- Singh, N. and Ahmad, J. 2017. A preliminary list of Lepidopteran insects from Palkot Wildlife Sanctuary, Jharkhand (India). *Journal of Entomology and Zoology Studies*, **5**(3): 654-661.
- Singh, N and Ranjan, R. 2016. Additions to the moth fauna of Dalma Wildlife Sanctuary, Jharkhand (India). *Rec. Zool. Surv. India*, **116**(4): 323-336.
- Singh, N, Ahmad, J. and Joshi, R. 2017. An Inventory of Moths (Lepidoptera) from Topchanchi WLS, Jharkhand (India). *Journal of Entomology and Zoology Studies*, **5**(4): 1456-1466.
- Singh, J., Singh, N., and Joshi, R. 2014. A Checklist of Subfamily Arctiinae (Erebidae : Noctuoidea : Lepidoptera) from India. *Rec. zool. Surv. India*, Occ. Paper No., 367: 1-76. (Published by the Director, Zool. Surv. India, Kolkata).

## Photographs of Adults



*Artena dotata* (Fabricius, 1794)



*Thyas coronata* (Fabricius, 1775)



*Ophiusa tirhaca* (Cramer, [1777])



*Ophiusa triphaenoides* Walker, 1858



*Parallelia stupeosa* (Fabricius, 1794)



*Bastilla joviana* (Stoll, 1782)



*Grammodes geometrica*  
(Fabricius, 1775)



*Achaea janata* (Linnaeus, 1758)



*Chalciope mygdon*  
(Cramer, [1777] 1779)



*Mocis frugalis* (Fabricius, 1775)



*Mocis undata*  
(Fabricius, 1775)



*Erebus ephesperis*  
(Hübner, 1827)



*Hamodes propitia*  
(Guérin-Méneville, [1831])



*Olepa koslandana*  
Orhant, 1986



*Aloa lactinea*  
(Cramer, [1777])



*Argina astrea*  
(Drury, 1773)



*Lemyra* sp.



*Amerila astreus*  
(Drury, 1773)



*Rajendra biguttata*  
(Walker, 1855)



*Creatonotos transiens*  
(Walker, 1855)



*Creatonotos interrupta*  
(Linnaeus, 1767)



*Aemene nilgrica*  
Hampson, 1891



*Syntomoides imaon*  
(Cramer, 1779)



*Nepita conferta*  
(Walker, 1854)



*Brunia antica*  
(Walker, 1854)



*Lymantria marginata*  
Walker, 1855



*Aroa sp.*



*Anomis flava*  
(Fabricius, 1775)



*Rusicada pindraberensis*  
Singh & Ranjan, 2016



*Hypocala deflorata*  
Fabricius, 1794



*Asota caricae*  
(Fabricius, 1775)



*Episparis liturata*  
(Fabricius, 1787)



*Mythimna yu* (Guenee, 1852)



*Leucania sp.*



*Leucania venalba*,  
Moore, 1867



*Spodoptera litura*  
(Fabricius, 1775)



*Spodoptera mauritia*  
(Boisduval, 1833)



*Yecalphis dilectissima*  
(Walker, 1858)



*Gastropacha pardale*  
(Walker, 1855)



*Helicoverpa assulta*  
(Guenée, 1852)



*Chasmina* sp.



*Ericeia inangulata*  
(Guenée, 1852)



*Chrysodeixis acuta*  
(Walker, [1858])



*Thyranophusia lectula*  
(Walker, 1858)



*Agrotis segetum*  
(Denis & Schiffermüller, 1775)



*Entomogramma fautrix*  
Guenée, 1852



*Bamra* sp.



*Earias luteolaria*  
Hampson, 1891



*Xanthodes transversa*  
Guenée, 1852



*Xanthodes albago*  
(Fabricius, 1794)



*Carea angulata*  
(Fabricius, 1793)



*Miromima naessigi*  
(Kobes, 1989)



*Theretra nessus*  
(Drury, 1773)



*Theretra oldenlandiae*  
(Fabricius, 1775)



*Theretra alecto*  
(Linnaeus)



*Theretra clotho*  
(Drury)



*Acomeryx* sp.



*Pergesa acteus*  
(Cramer, 1779)



*Agrius convolvuli*  
(Linnaeus, 1758)



*Cheromettia laleana*  
(Moore, 1859)



*Scopelodes albipalpalis*  
Hering 1931



*Eupterote geminata*  
(Walker, 1855)



*Pseudoteleclita* sp.



*Allata argentifera*  
Walker, 1862



*Armiana longipennis*  
(Moore, 1881)



*Paracerura* sp.



*Antheua servula*  
(Drury, 1773)



*Hexafrenum* sp.



*Antheraea mylitta*  
Drury, 1773



*Bombyx incomposita*  
(van Eecke, 1929)



*Botyodes caldusalis*  
(Walker, 1859)



*Cydalima laticostalis*  
(Guenée, 1854)



*Tyspanodes linealis*  
(Moore, [1868])



*Hyperythra lutea*  
(Stoll, [1781])



*Hyposidra talaca*  
(Walker, 1860)



*Chiasmia xanthonora*  
(Walker, 1861)



*Cleora* sp.



*Thalassodes veraria*  
Guenee, 1857



*Xyleutes persona*  
(Le Guillou, 1841)



*Zeuzera coffeae*  
Nietner