

Discovery

Moth Diversity of Coastal Purba Medinipur district, West Bengal: A Baseline Survey

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Author Affiliation:

¹Department of Zoology, Ramakrishna Mission Vivekananda Centenary College (Autonomous), Chowdhary Para, Rahara, Khardaha, West Bengal – 700118, India

²Forest Department, Govt. of West Bengal, West Bengal, India

³Zoological Survey of India, New Alipore, Kolkata – 700053, India

⁴Nature Mates - Nature Club, 6/7 Bijoygarh, Kolkata – 700032, West Bengal, India

*Corresponding author:

Arjan Basu Roy,

Nature Mates - Nature Club, 6/7 Bijoygarh, Kolkata – 700032, West Bengal, India,

Email: pakhibitan2019@gmail.com

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Bulganin Mitra¹, Anupam Khan², Samik Jana², Dipak Hazra³, Abhik Rong⁴, Lina Chatterjee⁴, Tarak Samanta⁴, Souvik Mazumdar³, Arjan Basu Roy^{4*}

ABSTRACT

Despite the ecological importance of moths, research in the coastal areas of Purba Medinipur district has predominantly focused on butterflies, leaving moth diversity relatively understudied. The present study was conducted in the seaside village of Baguran-Jalpai in Purba Medinipur district, reporting 20 moth species belonging to 13 subfamilies under six families and four superfamilies. Additionally, an updated checklist of 51 species, spanning 21 subfamilies across 11 families under seven superfamilies, recorded from the coastal area of Purba Medinipur district, is also provided.

Keywords: Moth, Coastal ecosystem, Baguran-Jalpai, Purba Medinipur, Checklist

1. INTRODUCTION

A comprehensive understanding of the species that currently inhabit an ecosystem is the first step towards adequately protecting and conserving its faunal diversity. Moths play vital ecological roles, contributing to pollination (Macgregor et al., 2015), nutrient cycling (Slade et al., 2013), and serving as key prey for a variety of predators (Wagner, 2020).

In the coastal belt of Purba Medinipur district, information on faunal diversity, particularly moth species, is scattered and incomplete. Only two moth species were identified in the early documentation by Jana et al., (2013) from Contai and Bajkul in the Purba Medinipur district: *Amata passalis* Fabricius, 1807 (Family Ctenuchidae) and *Spirama vestclio* Fabricius (Family Noctuidae). Eleven moth species from the recently formed Nayachar Island in the Purba Medinipur district were subsequently identified by Hazra et al., (2017). In addition to this, Das et al., (2022a) conducted a more comprehensive faunal survey in Kanai Chatta and adjoining coastal areas, reporting 35 moth species across nine families. Most recently, *Utetheisa* sp. (Family Erebidae) from the Kanaichatta mangrove was documented by Chatterjee et al., (2025a), adding another species.

These scattered yet valuable records suggest that the moth fauna of Purba Medinipur is far more diverse than previously recognized. With this perspective, a

faunal survey conducted in Baguran-Jalpai, a coastal village in Purba Medinipur district, resulted in the documentation of 20 moth species belonging to 13 subfamilies across six families under four superfamilies (Present record). Additionally, an updated checklist of 51 species belonging to 21 subfamilies across 11 families under seven superfamilies reported from the coastal area of Purba Medinipur district is provided, arranged alphabetically for ease of reference (Table 1).

2. MATERIALS AND METHODS

Study Area

The study was carried out close to the Birampur–Baguran Jalpai shoreline, which was named as Biodiversity Heritage Site by a notification (no. 910-EN/T-II-7/003-ii/2003) that appeared in The Kolkata Gazette on May 16, 2023. The study area encompasses the Pichaboni River Estuary in Purba Medinipur district, West Bengal, India, as well as the nearby intertidal zone ($21^{\circ}42'27''$ N, $87^{\circ}45'50''$ E), which is roughly 7.5 kilometres long (Fig. 1). The sandy beaches, mudflats, and patches of coastal vegetation that make up this coastal stretch create a mosaic of microhabitats that are ideal for a variety of nocturnal insect species, including moths. A healthy intertidal zone is indicated by the site's diverse fauna, which includes Sand Bubbler Crabs and Red Crabs. A sizable population of migratory birds, spiders, butterflies, aquatic insects, and odonates can also be found in this area (Chatterjee et al., 2025b; Khan et al., 2024; Rong et al., 2025; Samanta et al., 2022; Samanta et al., 2023).

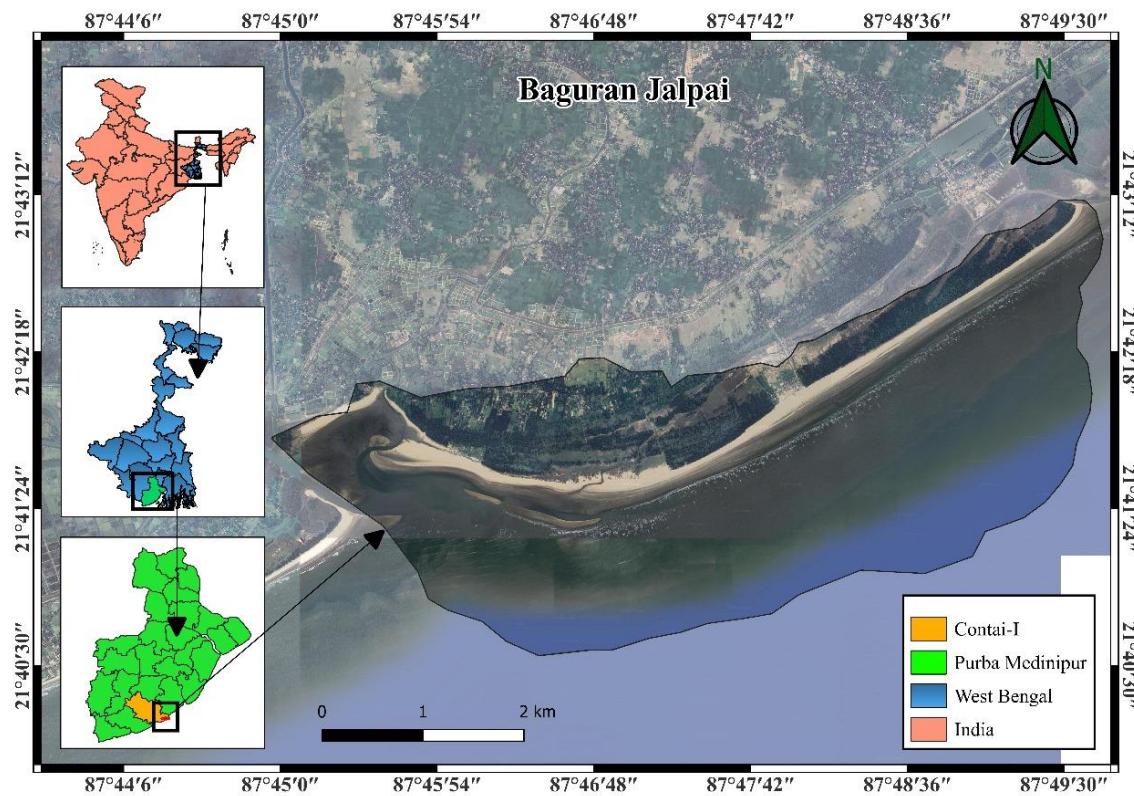


Figure 1: Map of the Study Area

Methodology

Adult moths were gathered at Baguran-Jalpai village during field surveys carried out in the Purba Medinipur district's coastal region between 2023 and 2024. From dusk to midnight (6 p.m. to 12 a.m.), a light sheet trap with a 160-watt coiled-type Mercury Vapour lamp illuminating a white cloth sheet (2×2 m) was in operation. To optimise attraction efficiency, the trap was positioned in open spaces far from conflicting light sources. In order to reduce the impact of unfavourable weather conditions like rain or strong winds, sampling was done on clear nights. The specimens were gathered and put to death in a killing bottle with an ethyl acetate-soaked cotton pad. The specimens were placed in insect envelopes after being killed. The specimens were processed further using conventional entomological techniques after they arrived at the Banbitan Butterfly Laboratory (Arora, 1986). Standard taxonomic literature and field guides were

used for identification and classification (Hampson, 1892, 1894, 1895, 1896; Holloway, 1985, 1987, 1988, 1999, 2009; Singh et al, 2024; Sondhi, 2024). A Nikon D5600 camera was used to take in situ photos of specimens whenever feasible.

3. RESULTS

During the current survey, a total of 20 moth species, representing 13 subfamilies, six families, and four superfamilies, were identified. In Table 1, these are indicated as PR (Fig. 2 & 3) (Present Record). Of these, sixteen species from the Purba Medinipur district's coastal regions are described here for the first time (Table 1). With 28 species, Noctuoidea is the most species-rich superfamily among the moth species found in Purba Medinipur district's coastal areas, while Erebidae is the most speciose family with 25 species (Table 1).

Table 1. Checklist of moth species reported from the coastal area of Purba Medinipur district

| Sl. No. | Species | Common name | Remarks |
|--------------------------------------------------------|---------------------------------------------|------------------------------------|-----------------------------------------|
| Superfamily BOMBYCOIDEA Latreille, 1802 | | | |
| Family BOMBYCIDAE | | | |
| Subfamily BOMBYCINAE | | | |
| 1. | <i>Trilocha varians</i> (Walker, 1855) | Greenish silk-moth | Das et al, 2022a |
| Family EUPTEROTIDAE Swinhoe, 1892 (Monkey moth) | | | |
| Subfamily EUPTEROTINAE Swinhoe, 1892 | | | |
| 2. | <i>Eupterote</i> sp. | Monkey Moth | PR (Photo-1) (Fig. 2) |
| Family SPHINGIDAE Latreille, 1802 (Hawk moth) | | | |
| Subfamily MACROGLOSSINAE | | | |
| 3. | <i>Daphnis nerii</i> (Linnaeus, 1758) | Oleander Hawkmoth | Das et al, 2022a |
| 4. | <i>Macroglossum gyrans</i> Walker, 1856 | Dark-bordered Hummingbird Hawkmoth | Das et al, 2022a |
| 5. | <i>Theretra boisduvalii</i> (Bugnion, 1839) | Boisduval's Hawkmoth | Hazra et al, 2017 |
| 6. | <i>Theretra clotho</i> (Drury, 1773) | Common Hunter Hawkmoth | Das et al, 2022a |
| Subfamily SPHINGINAE Latreille, [1802] | | | |
| 7. | <i>Agrius convolvuli</i> (Linnaeus, 1758) | Convolvulus hawk-moth | Das et al, 2022a |
| 8. | <i>Psilogramma vates</i> (Butler, 1875) | | PR(Photo-2) (Fig. 2) |
| Superfamily GEOMETROIDEA Leach, 1815 | | | |
| Family GEOMETRIDAE | | | |
| Subfamily ENNOMINAE | | | |
| 9. | <i>Hyperythra lutea</i> (Stoll, 1781) | | Das et al, 2022a |
| Subfamily OENOCHROMINAE | | | |
| 10. | <i>Eumelea rosalia</i> (Stoll, 1781) | | Das et al, 2022a |
| Family URANIIDAE Leach, 1815 (Swallowtail moth) | | | |
| Subfamily EPIPLEMINAE Hampson, 1892 | | | |
| 11. | <i>Europlema</i> sp. | | PR(Photo-3) (Fig. 2) |
| Superfamily NOCTUOIDEA Latreille, 1809 | | | |
| Family EREBIDAE Leach, 1815 | | | |
| Subfamily AGANAINAE Boisduval, 1833 | | | |
| 12. | <i>Asota caricae</i> (Fabricius, 1775) | Tropical Tiger Moth | PR(Photo-4) (Fig. 2) |
| Subfamily ARCTIINAE Leach, [1815] | | | |
| 13. | <i>Amata cyssea</i> (Stoll, 1782) | | Das et al, 2022a |
| 14. | <i>Amata passalis</i> (Fabricius, 1781) | | Das et al, 2022a |
| 15. | <i>Creatonotos gangis</i> (Linnaeus, 1763) | | PR(Photo-5), Hazra et al, 2017 (Fig. 2) |

| | | | |
|------------------------------------------------------|------------------------------------------------|----------------------------------|------------------------------------------------------------|
| 16. | <i>Creatonotos transiens</i> (Walker, 1855) | | PR(Photo-6), Das et al, 2022a (Fig. 2) |
| 17. | <i>Eressa confinis</i> (Walker, 1854) | | Das et al, 2022a |
| 18. | <i>Euchromia polymena</i> (Linnaeus, 1758) | | Das et al, 2022a, Hazra et al, 2017 |
| 19. | <i>Paramsacta moorei</i> (Butler, 1875) | | Hazra et al, 2017 |
| 20. | <i>Syntomoides imaon</i> (Cramer, 1780) | | Das et al, 2022a |
| 21. | <i>Utetheisa pulchelloides</i> | Heliotrope Moth | Das et al, 2022a |
| Subfamily CALPINAE Boisduval, 1840 | | | |
| 22. | <i>Eudocima materna</i> (Linnaeus, 1767) | Dot Underwing | PR(Photo-7), Das et al, 2022a (Fig. 2) |
| Subfamily EREBINAЕ Leach, [1815] | | | |
| 23. | <i>Achaea Janata</i> (Linnaeus, 1758) | Castor Semi-looper | PR(Photo-8), Das et al, 2022a, Hazra et al, 2017 (Fig. 2) |
| 24. | <i>Artena dotata</i> (Fabricius, 1794) | | PR(Photo-9) (Fig. 2) |
| 25. | <i>Bastille arctotaenia</i> (Guenee, 1852) | | Hazra et al, 2017 |
| 26. | <i>Chalciope mygdon</i> (Cramer, 1777) | | Das et al, 2022a |
| 27. | <i>Ercheia cyllaria</i> (Cramer, 1779) | | PR(Photo-10) (Fig. 2) |
| 28. | <i>Erebis macrops</i> (Linnaeus, 1768) | Common Owl Moth | Das et al, 2022a, Hazra et al, 2017 |
| 29. | <i>Grammodes fuccboicus</i> (Fabricius, 1787) | | Das et al, 2022a |
| 30. | <i>Hulodes caranea</i> (Cramer, 1780) | | Hazra et al, 2017 |
| 31. | <i>Hypopyra vespertilio</i> (Fabricius, 1787) | | Das et al, 2022a |
| 32. | <i>Mocis frugalis</i> (Fabricius, 1775) | Sugarcane Looper | Das et al, 2022a, Hazra et al, 2017 |
| 33. | <i>Rhesala moestalis</i> (Walker, 1866) | | Das et al, 2022a |
| 34. | <i>Spirama retorta</i> (Clerck, 1764) | | PR(Photo-11) (Fig. 3) |
| Subfamily HYPENINAE Herrich-Schäffer, [1851] | | | |
| 35. | <i>Hypena laceratalis</i> Walker, 1859 | Lantana Defoliator Moth | PR(Photo-12) (Fig. 3) |
| Subfamily LYMANTRIINAE Hampson, 1893 | | | |
| 36. | <i>Nygma plana</i> (Walker, 1856) | | PR(Photo-13) (Fig. 3) |
| Family NOCTUIDAE Latreille, 1809 (Owlet moth) | | | |
| Subfamily NOCTUINAE Latreille, 1809 | | | |
| 37. | <i>Spodoptera littoralis</i> (Boisduval, 1833) | | Hazra et al, 2017 |
| 38. | <i>Spodoptera litura</i> (Fabricius, 1775) | Cotton Leafworm, Tobacco Cutworm | PR(Photo-14), Das et al, 2022a, Hazra et al, 2017 (Fig. 3) |
| Subfamily PLUSIINAE Weller et al. 1994 | | | |
| 39. | <i>Chrysodeixis eriosoma</i> (Doubleday, 1843) | | PR(Photo-15) (Fig. 3) |
| Superfamily PYRALOIDEA | | | |
| Family CRAMBIDAE Latreille, 1810 (Grass moth) | | | |
| Subfamily ACENTROPINAE Stephens, 1836 | | | |
| 40. | <i>Parapoynx diminutalis</i> Snellen, 1880 | Hydrilla Leafcutter Moth | PR(Photo-16) (Fig. 3) |

| | | | |
|--------------------------------------------|------------------------------------------------|---------------------------------|-----------------------------------------|
| Subfamily SCHOENOBIINAE | | | |
| 41. | <i>Scripophaga incertulas</i> (Walker, 1863) | Yellow Stem Borer | Das et al, 2022a |
| Subfamily SPILOMELINAE Guenée, 1854 | | | |
| 42. | <i>Botyodes asialis</i> Guenée, 1854 | | PR(Photo-17) (Fig. 3) |
| 43. | <i>Cnaphalocrocis medinalis</i> (Guenée, 1854) | Rice Leafroller | PR(Photo-18), Das et al, 2022a (Fig. 3) |
| 44. | <i>Diaphania indica</i> (Saunders, 1851) | Cucumber Moth | Das et al, 2022a |
| 45. | <i>Hymenia perspectalis</i> (Hübner, 1796) | Spotted Beet Webworm Moth | PR(Photo-19) (Fig. 3) |
| 46. | <i>Leucinodes orbonalis</i> (Guenee, 1854) | Eggplant fruit & shoot borer | Das et al, 2022a |
| 47. | <i>Maruca vitrta</i> (Fabricius, 1787) | Maruca Pod Borer | Das et al, 2022a |
| 48. | <i>Spoladea recurvalis</i> (Fabricius, 1775) | Beet Webworm Moth; Banded Sable | PR(Photo-20) (Fig. 3) |
| Family PYRALIDAE | | | |
| Subfamily PYRALINAE | | | |
| 49. | <i>Endotricha mesenterialis</i> (Walker, 1859) | | Das et al, 2022a |
| Superfamily THYRIDOIDEA | | | |
| Family THYRIDIDAE | | | |
| Subfamily STRIGLININAE | | | |
| 50. | <i>Striglina scitaria</i> (Walker, 1862) | | Das et al, 2022a |
| Superfamily ZYGAENOIDEA | | | |
| Family LIMACODIDAE | | | |
| Subfamily LIMACODINAE | | | |
| 51. | <i>Parasa lepida</i> (Cramer, 1799) | Green Coat Moth | Das et al, 2022a |

Abbreviations used: PR- Present Record



Figure 2: Photo Plate 1 of Present Record (PR) 1-10

4. DISCUSSION

Purba Medinipur and South 24 Parganas are two coastal districts in West Bengal. Researchers and naturalists have historically focused more on the latter because it is home to the Sundarban Mangrove, the world's largest coastal wetland (Das et al., 2022b). Mitra (2017) compiled a comprehensive checklist of 95 moth species across 18 families from the Sundarban Biosphere Reserve. In contrast, the present study represents the first systematic documentation of moth fauna (51 species) from the coastal zone of Purba Medinipur. This

pioneering effort provides a foundational dataset that will support future taxonomic and biological research of the moth fauna in this region.

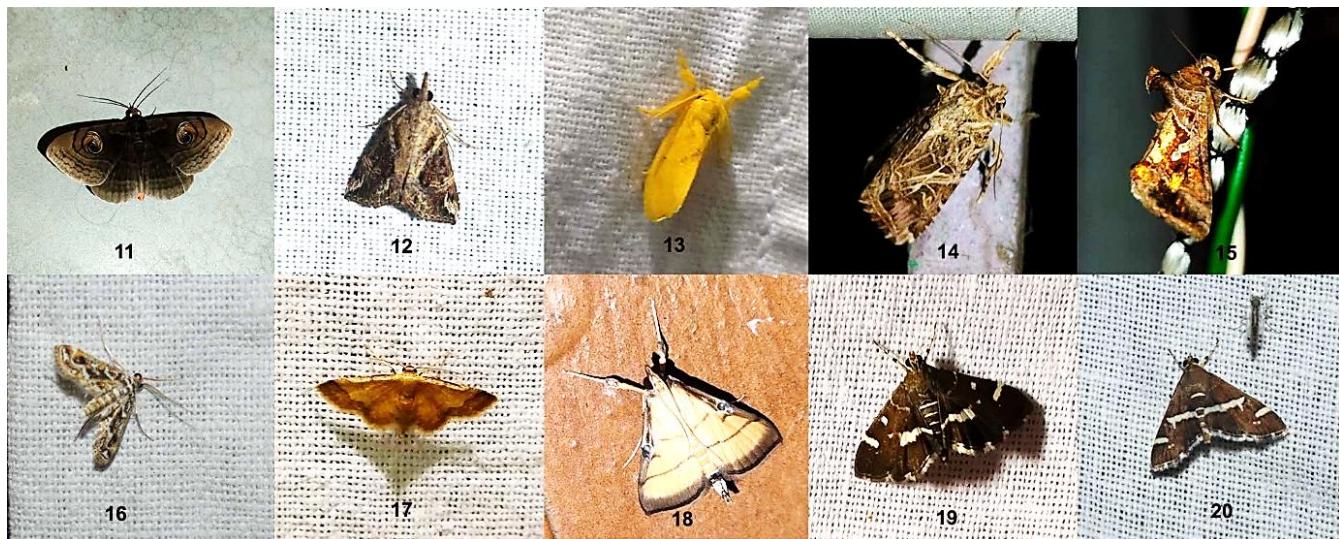


Figure 3: Photo Plate 2 of Present Record (PR) 11-20

The moth collection we have here shows a wide range of ecological types, including pests that are harmful to crops and those that aren't, pollinators, and species that live in mangrove forests. There are currently no detailed reports on the pest status of moths that specifically affect mangrove plants in Purba Medinipur. This shows that we still have a lot to learn about coastal entomofauna and how it interacts with the environment. The present study provides valuable baseline data on the moth fauna of the Purba Medinipur coastal zone, underscoring the region's potential for high species diversity.

5. CONCLUSION

This study provides the first consolidated account of moth diversity from the coastal belt of Purba Medinipur district, documenting 20 species from Baguran-Jalpai and updating the regional checklist to 51 species across 11 families. The findings highlight the ecological richness of this coastal ecosystem, which supports a diverse assemblage of moths including pest species, pollinators, and taxa associated with mangrove and coastal vegetation. This baseline inventory fills a big gap in our knowledge and will help with future ecological research, biodiversity monitoring, and conservation planning in the area, especially since coastal habitats are under more and more pressure from people.

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Authors contribution

BM helped in identification of the species, prepared the original draft of the manuscript and provided overall supervision. AK and SJ provided on field support and logistic facilities during the field surveys. DH, AR, LC SM, TS and ABR collected data from field and helped in manuscript preparation. ABR provided travel facilities and overall guidance and supervision. All authors reviewed the manuscript.

Informed consent

Not applicable.

Conflicts of interests

The authors declare that they have no conflicts of interests, competing financial interests or personal relationships that could have influenced the work reported in this paper.

Ethical approval & declaration

The study was done following all the legal guidelines. No animals or organisms were harmed during the study. Consent of the forest department was taken before conducting this study. The Animal ethical guidelines are followed in the study for species observation, identification & experimentation.

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Data and materials availability

All data associated with this study are present in the paper.

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