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A checklist on Butterfly (Insecta: Lepidoptera) Fauna of the Recreation Park Cum Medicinal Garden, Diphu, Karbi Anglong

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Abstract
The present study investigates and documents the butterfly inventory of the Recreation Park cum Medicinal Garden, Diphu, Karbi Anglong. The study has revealed a total of 59 butterfly species, covering 46 Genera under 5 Families. Nymphalidae Family was found to be dominant with 18 species, followed by Hesperioidae- 15, Lycaenidae- 11, Pieridae- 9, & Papilionidae with 6 species.

Keywords: Nymphalidae, papilionidae, hesperioidae, lycaenidae, diphu, karbi anglong

Introduction

The world of butterflies is truly remarkable, with approximately 17,000 known species scattered across the globe. These beautiful creatures are not only widely distributed in diverse habitats such as gardens, fields, deserts, and forests, but also play a crucial role as efficient pollinators of flowers, contributing to the production of fruits, seeds, and food crops. Additionally, butterflies provide viable services of the ecosystem, particularly in the recycling of vital nutrients like nitrogen, phosphorus, and potassium that are essential for crop growth. Various wild plants which are part of the agricultural systems forms the part of feed for the larval stages and release nutrient-rich feces, contributing to nutrient cycling in ecosystems. Furthermore, butterflies serve as a food source for birds and other predators and host several parasitic species that help to control crop pests. Despite their significance in ecological processes and their importance as pollinators, butterflies remain relatively understudied, especially in farmland habitats in tropical regions. The north-eastern region of India is a hotspot for butterfly and insect diversity, thanks to its rich vegetation. This area is home to an impressive 962 recorded species of butterflies, making it a crucial hotspot for biodiversity. The landscape is adorned with around 700 medicinal plants, bamboo, cane, orchids, and nectar-providing flowering plants, creating a sanctuary for various wild species and a diverse range of insects such as Lepidoptera, Coleoptera, Orthoptera, and Odonata. Despite the richness of this habitat, butterflies in this area are relatively poorly studied due to a lack of comprehensive surveys.

Materials and methods

The task was carried out in the Recreation Park Cum Medicinal Garden Diphu, Karbi Anglong from April 2022 to December 2023.The location is on the Diphu-Manja road in the Karbi Anglong district of the Assam state in India. It can be found at 25050'N 93026'E/25.830N 93.430E. The area has an average elevation of 186 meters MSL. The garden, established by the Forest Department of Karbi Anglong Autonomous Council, is a stunning creation. The rich, red loamy and sandy soil of the area provides the perfect foundation for a wide range of plant and animal life within the park. Observations of butterflies were conducted from 8 AM to 1 PM during daylight hours. However, for shade-loving butterflies, the survey was extended until 4-5 PM specifically during the summer season to capture their activity during later hours of the day. The butterflies were carefully documented through direct observation, random sampling and opportunistic surveys. Their photographs were captured using a Nikon Coolpix L110. To ensure accurate identification, all butterflies were identified down to the species level with the assistance of reference books (Kunte, 2000 [19] and Kehimker 2008) and various online resources.

Result

In the current survey, a comprehensive total of 59 butterfly species were identified in the study area, representing 5 families and 46 genera. The dominant family was Nymphalidae, comprising 18 species (31%), followed by Hesperioidae with 15 species (25%), Lycaenidae with 11 species (19%), Pieridae with 9 species (15%), and Papilionidae with 6 species (10%). Table 1 provides a comprehensive list of the butterflies discovered at the study site. Additionally, Figure 1 illustrates a pie diagram depicting the distribution of species among different families. It is worth noting that species belonging to the Lycaenidae, Nymphalidae, and Papilionidae families were found throughout all seasons, whereas species from the Hesperioidae and Pieridae families were absent during the winter season.

Table 1: List of butterfly species found in the study area.

Family	Species name	Common Name
Nymphalidae	1. *Hypolimnas bolina* Linnaeus, 1758	Great Egg fly
	2. *Junonia lemonias* Linnaeus, 1758	Lemon Pansy
	3. *Junonia atlites* Linnaeus, 1763	Grey Pansy
	4. *Junonia hierta* Fabricius, 1798	Yellow Pansy
	5. *Cethosia cyane* Drury, 1773	Leopard Lacewing
	6. *Euthalia phemius* Doubleday, 1848	White edged Blue Baron
	7. *Tanaecia lepidea* Butler,1868	Grey Count
	8. *Tanaecia cocytus* Fabricius, 1787	Lavender count
	9. *Ypthima baldus* Fabricius, 1775	Common Five ring
	10. *Neptis hylas* Linnaeus, 1758	Common Sailer
	11. *Neptis nandina* Moore, 1857	Sailers
	12. *Neptis yerburyi* Butler, 1886	Yerburyi Sailer
	13. *Pantaporia hordonia* Stoll, 1790	Common Lascar
	14. *Melanitis leda* Linnaeus, 1758	Common Evening brown
	15. *Elymnias hypermnestra* Linnaeus, 1763	Common Palm fly
	16. *Danaus chrysippus* Linnaeus, 1758	Plain Tiger
	17. *Euploea mulciber* Cramer,1777	Striped Blue Crow
	18. *Euploea core* Cramer,1780	Common Crow
Papilionidae	19. *Troides helena* Linnaeus, 1758	Common Birdwing
	20. *Papilio clytia* Linnaeus, 1758	Common Mime
	21. *Papilio memnon* Linnaeus, 1758	Great Mormon
	22. *Papilio polytes* Linnaeus, 1758	Common Mormon
	23. *Papilio demoleus* Linnaeus, 1758	Lime Butterfly
	24. *Papilio protenor* Cramer, 1775	Spangle
Pieridae	25. *Delias agostina* Hewitson, 1852	Yellow Jezebel
	26. *Hebomoia glaucippe* Linnaeus, 1758	Great Orange tip
	27. *Eurema blanda* Boisduval, 1836	Three Spot Grass Yellow
	28. *Eurema laeta* Boisduval, 1836	Spotless Grass Yellow
	29. *Catopsila crocale* Fabricius, 1775	Common Emigrant
	30. *Catopsila pomona* Fabricius, 1775	Lemon Emigrant
	31. *Cepora nerissa* Fabricius, 1775	Common Gull
	32. *Appias lyncida* Cramer, 1777	Chocolate Albatross
	33. *Leptosia nina* Fabricius, 1793	Oriental psyche
Lycaenidae	34. *Amblypodia anita* Hewitson, 1862	Leaf blue
	35. *Discolampa ethion* Westwood, 1851	Banded blue pierrot
	36. *Tarucus ananda* De Niceville, 1884	Dark pierrot
	37. *Prosotas nora* Felder, 1860	Common line blue
	38. *Rapala tara* De Niceville, 1884	Assam Flash
	39. *Catochrysops panormus* Felder, 1860	Forget me not
	40. *Catochrysops strabo* Fabricius, 1793	Forget me not
	41. *Udara dilecta* Moore, 1859	Pale Hedge blue
	42. *Cheritra freja* Fabricius, 1793	Common imperial
	43. *Heliophorus epicles* Godart, 1823	Purple Sapphire
	44. *Talicada nyseus* Guerin- Meneville, 1843	Red pierrot
Hesperioidae	45. *Hasora badra* Moore, 1857	Common Awl
	46. *Tagiades atticus* Fabricius, 1793	Common snow flat
	47. *Halpe zema* Hewitson, 1877	Banded Ace
	48. *Suada swerga* De Niceville, 1895	Grass Bob
	49. *Scobura isota* Swinhoe, 1893	Forest Bob
	50. *Ancistroides nigrita* Latreille, 1824	Chocolate Demon
	51. *Suastus minuta* Moore, 1877	Small Indian Palm Bob
	52. *Matapa aria* Moore, 1865	Common Red Eye
	53. *Asticopterus jama* Felder, 1860	Forest Hopper
	54. *Potanthus pseudomaesa* Moore,1881	Common Dart
	55. *Oriens gola* Moore,1877	Common dartlet
	56. *Parnara guttata* Bremer & Grey, 1852	Stright common swift
	57. *Abisara fylla* Westwood, 1851	Dark judy
	58. *Sarangesa dasahara* Moore, 1865	Small flat
	59. *Borbo cinnara* Wallace, 1866	Rice leaf folder

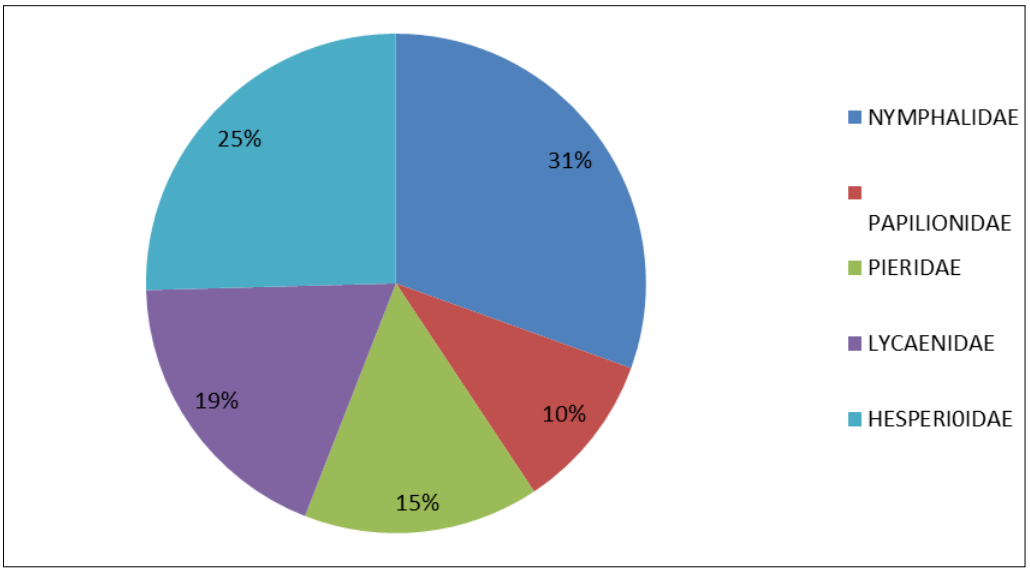

Fig 1: Showing the family wise distribution with percentage

Discussion

The study unequivocally identified a total of 59 butterfly species across 5 families within a one-year period. Notably, the family Nymphalidae exhibited the highest prevalence, encompassing 18 species, while Papilionidae, Pieridae, Lycaenidae, and Hesperiodae contributed 6, 9, 11, and 15 species, respectively. The dominant presence of Nymphalidae underscores their adaptability across diverse habitats, attributed to their polyphagous nature. The study area is evidently rich in host plants, as indicated by the substantial proportion of nymphalid species. Furthermore, the widespread distribution of all recorded species in India is well-documented (Wynter-Blyth 1957) [38]. In a separate study, Kunte *et al.* (2012) [20] documented 298 species and 3,736 individuals in Garo Hills, Meghalaya, while Malabika Kakati Saikia (2014) [31] reported 5,133 individuals from 140 species at Guwahati University Campus, Jalukbari, Assam. Some of the notable works include, Saikiya *et al.,* 2010 investigated the Nymphalid butterflies at Rani-Garbhanga Reserve Forest and reported 109 species, 154 spec
ies were documented from Chakrashila Wildlife Sanctuary by Choudhury and Ghosh (2008), and Gogoi (2015) [13] reported 116 Lycaenidae butterflies from Panbari Reserve Forest and adjoining areas in Kaziranga National Park. Additionally, 237 species of butterflies were reported in 8 Reserve forest areas and Dehing-Patkai Wildlife Sanctuary, covering three districts in the eastern part of upper Assam (Singh, 2017) [35].

The current study area boasts approximately 700 medicinal plants, including bamboo, cane, orchids, and nectar-providing flowering plants. Notably, the park provides sanctuary to a diverse array of wild species and various insects, such as Lepidoptera coleopteran, spiders, and birds. The research findings serve as a vital resource for conservation planners and policymakers, revealing that the biodiversity of butterflies in Recreation Park surpasses initial expectations. Furthermore, the study underscores the value of local flowers, herbs, and agro forestry systems in butterfly conservation. It also emphasizes the critical roles played by different butterfly species in maintaining a balanced ecosystem within the park. The findings shed light on the most prevalent butterfly species and their preferred habitats. Ultimately, the study unequivocally advocates for the comprehensive conservation of butterflies, recognizing their indispensable ecological significance.

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