Assessment of Lepidopteran Diversity and Habitat Integrity in Patna Urban Green Spaces (September–October 2025)

A Report prepared for : State Biodiversity Board Bihar, India

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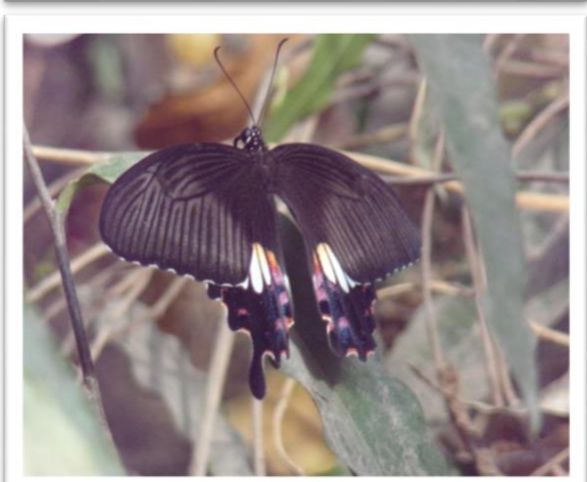

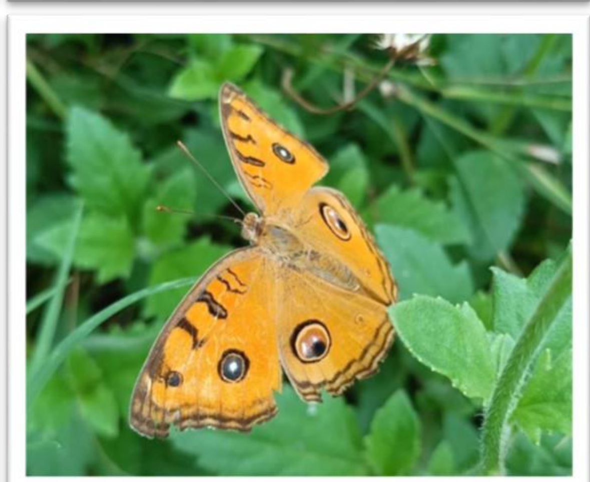

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Introduction

Urbanization is widely recognized as the primary global driver of habitat loss, fragmentation, and subsequent biodiversity decline (Renata et.al. 2022). As cities expand, the remaining green spaces—including parks, academic campuses, and engineered landscapes—become critical, though often poorly understood, reservoirs of ecological values are widely recognized as excellent bio-indicators of ecosystem health due to their high sensitivity to changes in vegetation structure, microclimates, and host plant availability (Liivamägi et.al. 2014). Therefore, monitoring their populations provides a direct, measurable assessment of the ecological quality of the urban environment. The city of Patna, experiencing rapid infrastructure development, offers a vital case study for evaluating how distinct types of managed green spaces contribute to regional biodiversity persistence. As the current findings confirm, this practice creates ecologically simplified environments that fail to support specialist species, leading to a demonstrable loss of overall biodiversity and community stability.

The primary purpose of this report is to conduct an ecological assessment of Lepidopteran diversity and habitat integrity across ten distinct urban green spaces in Patna, Bihar, during the optimal post-monsoon period (September–October 2025). The study systematically categorizes and compares these sites based on land use and maintenance practices to determine which typologies function most effectively as biodiversity refugia.

The core objectives are:

- To quantify and compare the species richness, abundance, and diversity indices of butterfly communities across the ten study sites.
- To analyze the correlation between habitat structural complexity, vegetation management intensity, and the observed Lepidopteran community metrics.
- To identify the dominant and rare species within the urban matrix and document critical trophic pathways, including key nectar and host plant associations.
- To develop evidence-based, actionable conservation policy recommendations for the Bihar State Biodiversity Board, promoting functional zonation and the integration of native flora to enhance the ecological resilience of Patna's urban green infrastructure.

Study Area

The study was conducted across ten distinct urban green spaces in Patna, Bihar, during the peak post-monsoon season, from September to October 2025, which is characterized by optimal butterfly activity. The ten sites were strategically selected to represent the functional diversity of green infrastructure within the urban matrix (Figure 1).The study regions were segmented into three functional typologies: Academic Refugia (Patna Science College, Patna NIT Campus, Patna College, Patna Women's College, Vanijya Mahavidyalaya), Managed Public Parks (Eco Park, Navin Sinha Park, Buddha Smriti Park, Vir Kunwar Singh Park), and Engineered Urban Ecotones (J.P. Ganga Path).

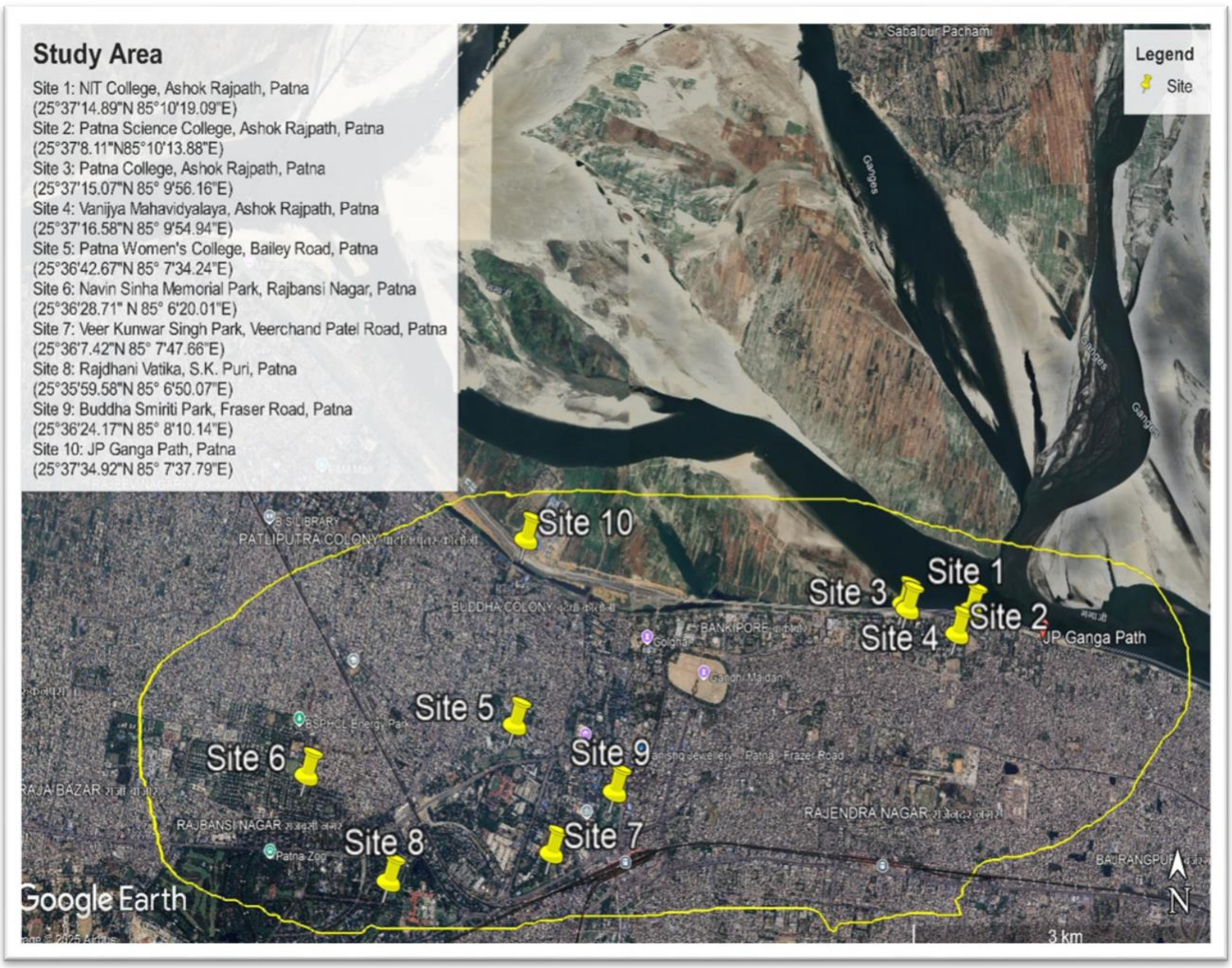

Figure 1. Map of Study Area.

Methodology

Butterfly diversity and abundance were assessed using the Pollard Walk technique, which is effective for comparative urban surveys (Pollard, 1977).

- **Timing:** Surveys were conducted on clear, sunny days between **12:00 PM and 3:00 PM**, when Lepidopteran activity is at its peak. Each site was surveyed multiple times during the study period.
- **Data Collection:** During each survey, all encountered butterfly individuals were identified to the species level where possible and counted. The following behavioural and spatial data points were recorded for each sighting:
    - **Species Identification and Count (Abundance,** N**)**
    - **Specific Behaviour** (e.g., nectaring, basking, flying, resting, or frugivory).
    - **Plant Association:** Interactions with specific host or nectar plant species were recorded to establish trophic links.
- **Habitat Assessment:** The presence and abundance of dominant native, ornamental, and Invasive Alien Species (IAS) of plants were concurrently recorded to characterize habitat structure and resource availability.

Statistical tools used

1. Shannon Diversity Index (H')

- A measure of diversity and how balanced the population is across all species. A higher value means the ecosystem is more complex and healthier.
    - **Formula :** $\boldsymbol{H} = -\Sigma pi \times ln(pi)$.
    - pi is the proportion of individuals for a single species.
    - ln =Natural log.
    - Σ =Greek symbol that means “sum”
    - This measures the community's overall heterogeneity.

2. Simpson Diversity Index (D)

- A measure of stability and low dominance. Values close to 1 show that no single species is taking over the population.
  - **Formula :** $\boldsymbol{D = \Sigma \frac{n_i(n_i-1)}{N(N-1)}}$
  - n_i is the number of individuals of species i.
  - N is the total number of individuals of all species.

3. Pielou's Evenness Index (J')

- A measure of how equally individuals are distributed among the species present.
  - **Formula:** $\boldsymbol{J = \frac{H}{ln(S)}}$
  - H' is the Shannon Diversity Index.
  - S is the Species Richness (total number of species).
  - Log Base e is the natural logarithm (ln).
  - Values near 1 mean all species are nearly equally abundant.

Results

A total of 33 different species of butterflies were found belonging to 5 distinct Families. The ecological survey data consistently identifies Patna Science College as the site exhibiting the highest diversity and stability among all locations. It recorded the highest Species Richness (S) at 27, which is particularly significant as the total observed species across all sites was 33. This richness reflects a complex habitat capable of sustaining a large variety of butterflies. Correspondingly, its Shannon Diversity (H') of 3.0679, Simpson Diversity (D) of 0.9472 and Pielou's Evenness Index (J') of 0.94 were the highest recorded values, indicating a community structure with maximal diversity, high stability, and low dominance by any single species. Collectively, the Total Abundance (N) of 1,470 across all aggregated sites captures the peak butterfly activity characteristic of the post-monsoon season in the city (Table 1). The study covered ten urban green spaces in Patna, Bihar, which were categorized into three distinct functional typologies based on land use and maintenance: Academic Biodiversity Refugia, Managed Public Parks, and Engineered Urban Ecotones. The academic campuses (Sites 1, 2, 3, 4, 5) consistently demonstrated a higher ecological value due to older, more diverse green infrastructure and low vegetation management intensity. In contrast, the Engineered Urban Ecotones like J.P. Ganga Path (Site 10), designed for cycling and walking, were characterized by structural simplification and standardized landscaping.

Table 1. Key Quantitative Indicators (Summary).

Metric	Highest Value (Site)	Corresponding Ecological Observation
Species Richness (S)	27 (Patna Science College)	Reflects complex habitat sustaining 33 observed species in total.
Shannon Diversity (H')	3.0679 (Patna Science College)	Indicates highest stability and lowest dominance across all sites.
Simpson Diversity (D)	0.9472 (Patna Science College)	Corroborates maximally diverse community structure.
Pielou's Evenness Index (J')	0.94 (Patna Science College)	Suggests evenly distribution of species.
Total Abundance (N)	1,470 (Aggregate)	Represents peak post-monsoon activity across the city.

Quantitative Diversity Metrics

The total number of species in the study period were observed to be 33 belonging to 5 different families. The most dominant family was found to be Nymphalidae (13sp) followed by Pieridae (7sp), Papilionidae (4sp), Lycaenidae (4sp) and Hesperiidae (4sp) (Fig 2).

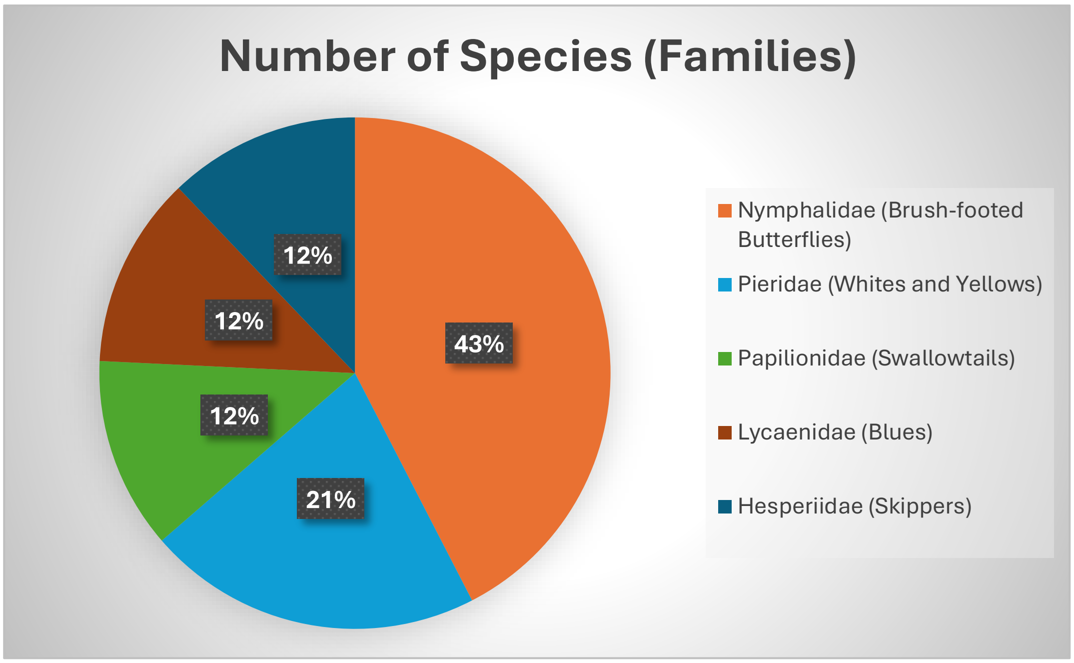

Figure 2. No. of species by family

Table 2 reveals a clear and significant gradient in butterfly biodiversity across Patna's urban green spaces. Patna Science College stands out as the most vital urban refugium, achieving the highest Species Richness (S=27), the highest Shannon Diversity Index (H'=3.0679), and the highest Simpson Diversity Index (D=0.9472). These metrics confirm a complex, healthy ecosystem that supports a large number of species with a highly stable and balanced community structure. In sharp contrast, the J.P. Ganga Path represents the lowest extreme, exhibiting the lowest richness (S=9) and the lowest Shannon index (H'=2.0565). The comparatively low Simpson Diversity Index (D ≈ 0.81), despite moderate Evenness (J'=0.9360), suggests this engineered environment suffers from structural simplification, which severely limits the total number of species and promotes a dominance pattern among the few generalist species present. Intermediate sites, such as the Public Parks (e.g., Eco Park: S=13, H'=2.4017), fall between these extremes, supporting less diversity than the established academic campuses but demonstrating better community structure than the newly engineered riverfront.

Dominant Species

The butterfly community is dominated by a few species, with the top five species accounting for a large proportion of the total individuals observed:

1. **Peacock Pansy** (153)
2. **Dark small branded swift** (141)
3. **Lemon Emigrant** (116)
4. **Common Grass Yellow** (96)
5. **Rice swift** (88)

The Peacock Pansy, in particular, demonstrates the highest overall numerical dominance (Figure 3).

Rare Species

A number of species exhibited extremely low abundance, suggesting habitat limitation or specialized requirements that are scarce in the urban setting. The rarest species observed (total count < 5) included:

- **Common commander** (1)
- **Indian grizzled skipper** (1)
- **Common barron** (2)
- **Common Rose** (3)
- **Glassy tiger** (4)
- **Great eggfly** (5)

The presence of the **Common Rose** (3 individuals) and the **Common commander** (1 individual) suggests that their critical, specialized host plants (like *Aristolochia* for the Rose) are present only in minimal quantities or highly localized areas.

P.T.O

Abundance by Location

The total abundance of butterflies varies dramatically across the study sites, strongly correlating with the high-diversity. The two academic campuses —**Patna Science College** (233), and **Patna NIT Campus** (205) and a single maintained park **Vir Kunwar Singh Park** (219), —recorded the highest total abundances, reinforcing their role as the primary **urban refugia**. The **J.P. Ganga Path** (89) and **Vanijvya Vidhyalaya** (58) recorded the lowest total abundances, indicating that environmental factors (like management intensity or structural simplicity) severely limit the overall carrying capacity for butterfly populations in these areas.

Table 2. Lepidopteran Diversity and Community Structure Metrics (September-October, 2025).

Location	**S (Species Richness)**	**N (Total Individuals)**	**Shannon H'**	**Simpson D**	**Pielou's J' (Evenness)**
Patna Science College	27	233	3.0679	0.9472	0.9416
Vir Kunwar Singh Park	25	219	2.9230	0.9383	0.9198
Patna NIT Campus	24	205	2.8848	0.9355	0.9333
Patna College	22	113	2.8733	0.9406	0.9591
Patna Women's College	21	172	2.6215	0.8934	0.8903
Navin Sinha Park	16	108	2.5835	0.9232	0.9318
Buddha Smriti Park	15	173	2.4944	0.9065	0.9211
Eco Park	13	100	2.4017	0.9033	0.9363

Vanijya Vidyalaya	13	58	2.3874	0.8834	0.9308
J.P. Ganga Path	9	89	2.0565	0.8127	0.9360

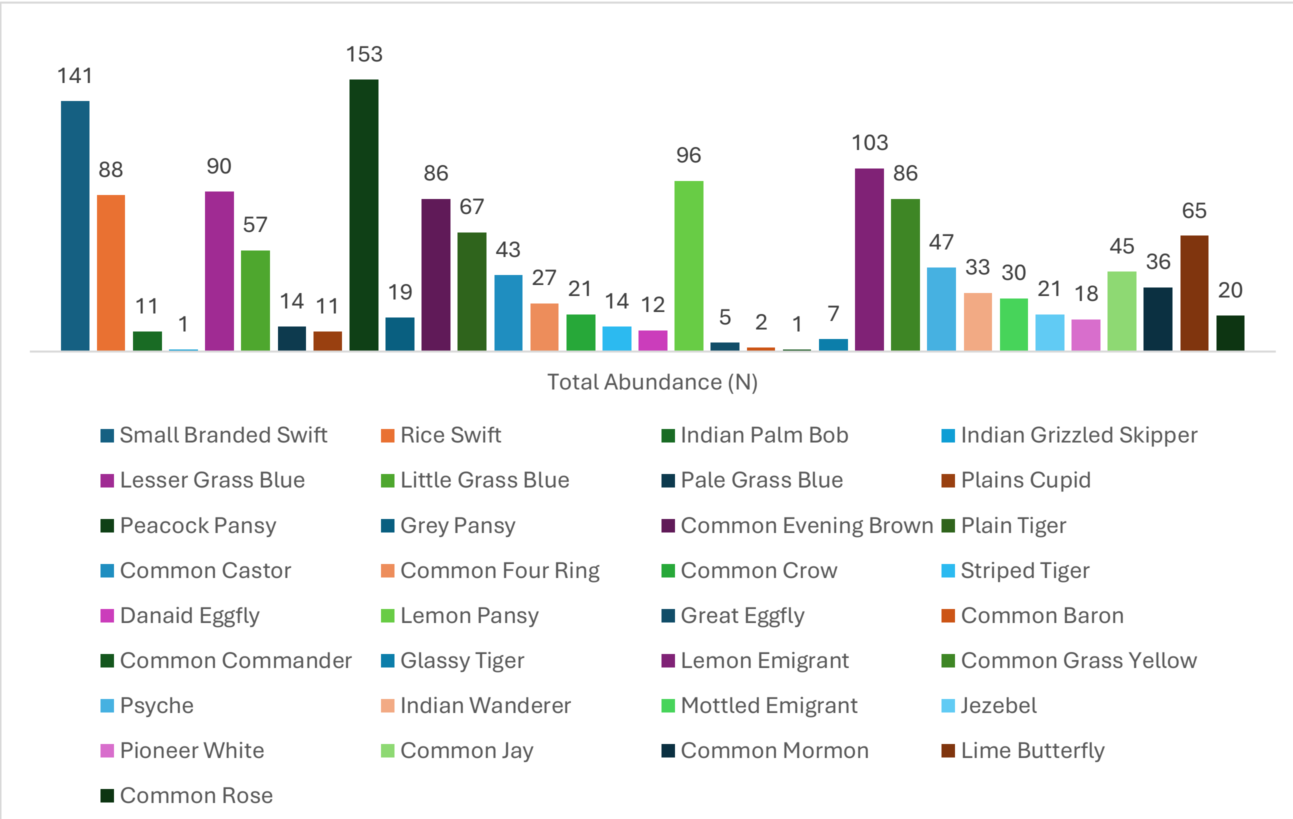

Figure 3. Total abundance of butterflies.

In academic campuses we noticed that there were no restrictions on the growth of *Tridax* and *Lantana*. However, these species are invasive and are considered a threat to native species. If they are regularly maintained in secluded regions they can be work as both ornamental and host plants for Butterflies. Sites like Patna Science College and Patna NIT Campus benefit from **low vegetation management intensity** and a greater tolerance for heterogeneous vegetative cover. This complexity provides specialized larval host niches, evidenced by the presence of the specialist Common Rose (*Pachliopta aristolochiae*) at Patna Science College, which requires the presence of its host plant, *Aristolochia indica*. Academic institutions function as unintentional ecological islands, retaining structural complexity that is actively removed elsewhere.

Managed Public Parks (Intermediate Diversity): Public parks prioritize manicured aesthetics, resulting in the **systematic removal of the herbaceous understory** and plants perceived as "weeds." This habitat homogenization negatively affects species richness (e.g., Eco Park S=13). Vir Kunwar Singh Park was found out to be the most diverse (S=24) in comparison with other parks because of its composition of mostly flower bearing plants. The sensitivity of families like Lycaenidae (Blues), which require small, specific herbaceous and leguminous host plants, confirms the deficit of these crucial low-lying resources in strictly maintained parks.

Engineered Ecotones (Low Diversity): The J.P. Ganga Path is characterized by severe habitat simplification and linear, new landscaping, lacking the vertical stratification (understory, shrubs) and temporal stability needed to support diverse life cycles, resulting in the lowest S and H' values. Only in the periphery floral vegetation the butterflies were observed, implying that the plants in the side portion of this region should contain more flowering plants like ixora.

Observations across all sites highlighted the importance of a diverse floral profile, including both ornamental plantings and naturalized herbaceous species (Table 3).

1. High-Value Herbaceous Nectar Resources: The observation of high butterfly activity on *Tridax procumbens* and *Ixora* underscores their ecological value. *Tridax procumbens*, though classified as a noxious Invasive Alien Species (IAS) or weed, provides persistent, low-cost nectar, supporting a wide guild of species:

- **Observed Species Nectaring on *Tridax procumbens***: Lime Butterfly, Lemon Emigrant, Mottled Emigrant, Common Crow, Plain Tiger, Striped Tiger, Common Grass Yellow, Rice Swift, Dark Small Branded Swift, Lemon Pansy, Peacock Pansy, and Common Jay.

2. Ornamental and Invasive Nectar Sources: It is also noted that high utilization of ornamental and invasive species by butterflies, which currently sustain their urban populations but are ecologically dependent and require native alternatives for long-term health:

- Species like the Lime Butterfly, Mottled Emigrant, and Common Mormon were seen on **Ixora** (ornamental shrubs), which provide structurally suited flower clusters for species with longer proboscides.

- Other observed high-value species included **Lantana** (Invasive Alien Species - IAS), **Catharanthus** (Periwinkle), **Champa** (*Plumeria* spp.), **Indian catmint** (*Anisomeles indica*). **Globe amaranth** (*Gomphrena* spp.), and **Coral vine** (*Antigonon* spp.) (Table 3).

3. Frugivory as a Critical Trophic Pathway: At Buddha Smriti Park, a critical supplementary food source was noted: ***Ficus benghalensis*** (Banyan tree) during its fruiting season. Large numbers of **Peacock Pansy** and **Common Evening Brown** were observed feeding directly on the fruits. This frugivory is a high-energy trophic behaviour, especially important for large Nymphalidae species to acquire essential nutrients, and emphasizes the conservation value of retaining mature, native fruiting trees within parks.

Table 3. High-Value Nectar Plants and Suggested Native Indian Alternatives.

Observed Plant Species	**Status in India**	**Key Butterfly Guilds**	**Suggested Native Alternative**	**Habitat Design Role**
Tridax procumbens (Coatbuttons)	Naturalized Weed/IAS	Generalist Nectar Feeders	**Tridax** (Retain in Wild Zones)	Persistent herbaceous resource.
Lantana camara (Lantana)	Invasive Alien Species (IAS)	Generalist Nectar Feeders	*Vitex negundo* (Nirgundi)	Dense shrub layer, nectar.
Ixora coccinea (Pendkuli)	Ornamental/Naturalized	Swallowtails, Emigrants	*Can be used*	Formal shrub, robust flowers.

Catharanthus roseus (Periwinkle)	Ornamental/Naturalized	Generalist Nectar Feeders	*Can be used*	Low-growing herbaceous resource.
Bacopa monnieri (Water Hyssop)	Ornamental/medicinal herb	Generalist Nectar Feeders.	*Can be used*	Low-growing herbaceous resource.
Plumeria spp. (Champa)	Ornamental	Generalist Nectar Feeder.	*Can be used*	Canopy, nectar
Saraca asoca (Ashoka Tree)	Ornamental	Large Nymphalids	*Can be used*	Canopy, host for Jays
Anisomeles indica (Indian Catmint)	Cultivated	Generalist Nectar Feeders	*Can be used*	Low herbaceous nectar/host.
Ocimum tenuiflorum (Tulsi) [4]	Cultivated/medicinal	Generalist Nectar Feeders	*Can be used*	Subshrub/nectar
Antigonon spp. (Coral vine)	Ornamental/Naturalized	Swallowtails, Large Nymphalids	*Can be used*	Climbing host and structural element.

Discussion

The urban environment supports generalist visual predators, such as the Jungle Babbler (Mukherjee et.al. 2021) and Oriental Garden Lizard (Sudasinghe & Somaweera, 2015), whose hunting success is mitigated by the tiered, complex vegetation found in sites offering refuge, which is directly linked to enhanced adult butterfly survival compared to open lawns. Therefore, the primary goal of conservation policy must be to shift management from purely aesthetic to ecologically functional, implementing tailored improvements for each habitat type. For Academic Biodiversity Refugia, policy must mandate "No-Mow" zones (Humbert et.al. 2009) for specialist larval host plants (*Aristolochia*, *Citrus spp*., *Calotropis spp*.) and leverage academic resources to reintroduce scarce species, transforming campuses into secure, high-value biodiversity banks. Managed Public Parks require a policy of Functional Zonation, designating a mandatory minimum of 15% of green space as "Wild Zonation" (Lerman et.al. 2018) to prohibit mowing (March–November) and secure herbaceous resources like *Tridax procumbens*, while also introducing native shrubs and climbers to increase structural (vertical) complexity for predator shelter and planting native Ficus species to support Nymphalidae frugivores (Boggs et.al. 2003). Lastly, Engineered Urban Ecotones must be mandated to abandon uniform monoculture in future landscaping for a tiered vegetation approach (groundcover, shrubs, small trees) to enhance structural complexity, prioritizing indigenous, fast-growing native grasses (Poaceae) to quickly establish a foundational resource layer for numerically dominant skippers and pierids.

Conservation Focus: Active habitat simplification, particularly the elimination of native herbaceous nectar resources like *Tridax procumbens* in public parks, directly suppresses species richness and specialization. Strategic policy must enforce **functional zonation** and the integration of diverse native flora to enhance ecological resilience against urban pressures, including predation by generalist species like the Jungle Babbler (*Turdoides striatus*) and the Oriental Garden Lizard (*Calotes versicolor*).

P.T.O

Master Species Inventory and Taxonomy

The survey identified 33 species across five families, confirming that Nymphalidae holds the highest species richness, while Hesperiidae (Skippers) exhibit the highest numerical abundance (over 17% of N) due to their reliance on ubiquitous grass host plants (Table 4).

Table 4. Master Checklist of Observed Lepidopteran Species (Patna Survey, 2025).

Family	Common Name	Scientific Name	Total Abundance (N)	Ecological Notes
Hesperiidae	Small Branded Swift	*Pelopidas mathias* (Fabricius, 1798)	141	Most abundant Skipper; larvae feed on grasses (Poaceae).
	Rice Swift	*Borbo cinnara* (Wallace, 1866)	88	Second most abundant skipper,
	Indian Palm Bob	*Suastus gremius* (Fabricius, 1798)	11	Associated with palms.
	Indian Grizzled Skipper	*Spialia galba* (Fabricius, 1793)	1	Small, spotted skipper.
Lycaenidae	Lesser Grass Blue	*Zizina otis* (Fabricius, 1787)	90	Small species, associated with herbaceous legumes.
	Little Grass Blue	*Zizeeria karsandra* (Moore, 1865)	57	Associated with herbaceous legumes.

	Pale Grass Blue	*Pseudozizeeria maha* (Kollar, 1844)	14	Low-flying blue.
	Plains cupid	*Luthrodes pandava* (Horsefield, 1829)	11	Extremely small butterfly.
Nymphalidae	Peacock Pansy	*Junonia almana* (Linnaeus, 1758)	153	Nectar feeder on *Ixora* and *Tridax*; larvae on *Bacopa*.
	Grey Pansy	*Junonia atilites*	19	Associated with Tridax
	Common Evening Brown	*Melanitis leda* (Linnaeus, 1758)	86	Crepuscular; larvae feed exclusively on grasses (Poaceae).
	Plain Tiger	*Danaus chrysippus* (Linnaeus, 1758)	67	Widespread aposematic species, feeds on Milkweeds
	Common Castor	*Ariadne merione* (Cramer, 1777)	43	Larvae feed on Euphorbiaceae (Castor oil plant).
	Common Four Ring	*Ypthima huebneri* (Kirby, 1871)	27	Common Satyrine; larvae feed on grasses.
	Common Crow	*Euploea core* (Cramer, 1780)	21	Aposematic, slow flyer.

	Striped Tiger	*Danaus genutia* (Cramer, 1779)	14	Similar to Plain Tiger, shares host plants.
	Danaid Eggfly	*Hypolimnas misippus* (Linnaeus, 1764)	12	Female mimics Plain Tiger.
	Lemon Pansy	*Junonia lemonias* (Linnaeus, 1758)	96	Common urban species.
	Great Eggfly	*Hypolimnas bolina* (Linnaeus, 1758)	5	Exhibits Batesian mimicry with Common Crow.
	Common Baron	*Euthalia garuda* (Moore, 1857)	2	Larvae feed on Mango (*Mangifera*).
	Common Commander	*Moduza procris* (Cramer, 1777)	1	Requires specific forest vegetation, an important urban record.
	Glassy Tiger	*Parantica aglea* (Stoll, 1782)	7	Requires dense, complex vegetation.
Pieridae	Lemon Emigrant	*Catopsilia pomona* (Fabricius, 1775)	103	Strong migrant, larvae feed on *Cassia* specie.
	Common Grass Yellow	*Eurema hecabe* (Linnaeus, 1764)	86	Extremely common, low-flying urban species; larvae on legumes.

	Psyche	*Leptosia nina* (Fabricius, 1793)	47	Delicate butterfly, often found near herbaceous edges.
	Indian Wanderer	*Colotis aurora* (Cramer, 1777)	33	High mobility species.
	Mottled Emigrant	*Catopsilia pyranthe* (Linnaeus, 1758)	30	Very common, feeds on *Cassia* specie.
	Indian Jezebel	*Delias eucharis* (Drury, 1773)	21	Aposematic, larvae feed on Mistletoes (Loranthaceae).
Pieridae	Pioneer White	*Belenois aurota* (Fabricius, 1793)	18	Migratory species.
Papilionidae	Common Jay	*Graphium doson* (C. & R. Felder, 1864)	45	Fast flyer, associated with diverse canopy.
	Common Mormon	*Papilio polytes* (Linnaeus, 1758)	36	Polymorphic, strong flyer, host plant Rutaceae (Curry Leaf, Citrus).
	Lime Butterfly	*Papilio demoleus* (Linnaeus, 1758)	65	Widespread, larvae on Rutaceae (Citrus).
	Common Rose	*Pachliopta aristolochiae* (Fabriciu, 1775)	20	Specialist aposematic species on *Aristolochia*.

Conclusion

The study revealed stark differences in butterfly diversity across the 10 sites, clearly correlated with habitat type and management intensity. Academic campuses consistently outperformed managed parks and engineered landscapes. It confirms that urban green spaces in Patna, particularly academic campuses, function as significant reservoirs for butterfly diversity. This diversity is directly threatened by intensive landscaping practices that prioritize ornamental plants over native plants.

Recommendation:

To support breeding populations of butterflies, it is recommended to plant native host plants such as *Aegle marmelos* (Bael) and *Murraya koenigii* (Curry Leaf) for Papilionids, *Calotropis gigantea* (Crown Flower) for Tigers and Crows, and various grasses (Poaceae family) for Swifts and Blues.

Bihar State Biodiversity Board is recommended to promote a "two-pronged" landscaping policy for public and institutional green spaces:

1. **Preserve Complexity:** Protect existing patches of high-quality habitat (mature trees, unmanaged undergrowth).

2. **Create Complexity:** Actively create new habitats by planting diverse native nectar/host plants and designating "managed meadow" zones where beneficial "weeds" are allowed to flourish.

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PHOTOPLATE

Hesperiidae


Small Branded Swift
(Pelopidas mathias)
© Md. Shahbaz, Asfia Zafar, Rishu Raj


Rice Swift
(Borbo cinnara)
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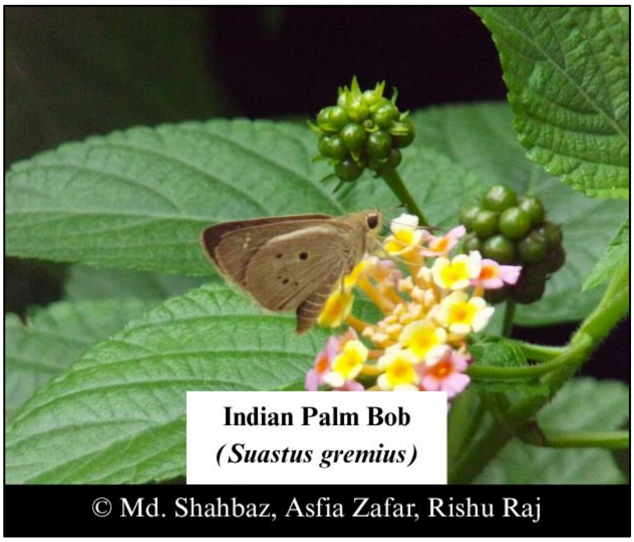
Indian Palm Bob
(Suastus gremius)
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Indian Grizzled Skipper
(Spialia galba)
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Lycaenidae


Lesser Grass Blue
(Zizina otis)
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Little Grass Blue
(Zizeeria karsandra)
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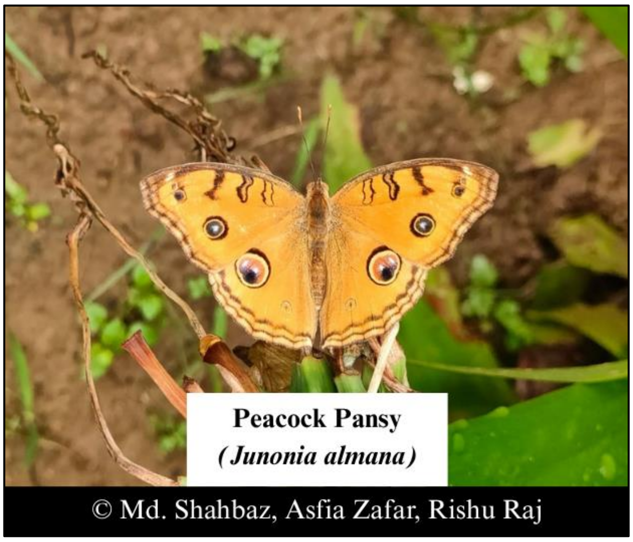
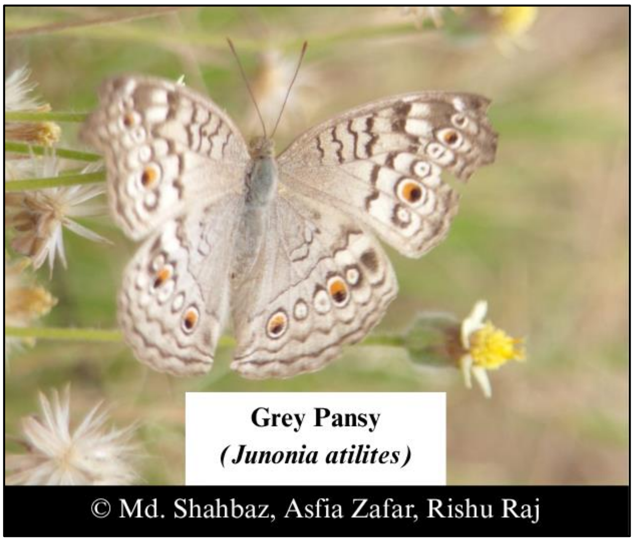
Pale Grass Blue
(Pseudozizeeria maha)

Plains Cupid
(Luthrodes pandava)

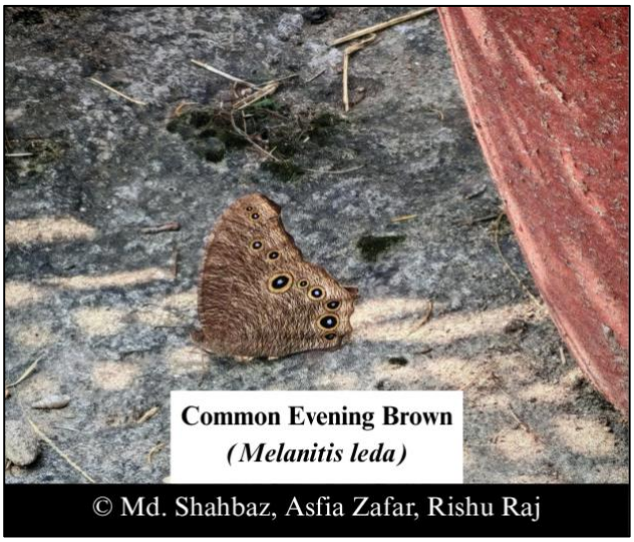
Nymphalidae



Peacock Pansy
(Junonia almana)



Grey Pansy
(Junonia atilites)



Common Evening Brown
(Melanitis leda)

Plain Tiger
(Danaus chrysippus)

Common Castor
(Ariadne merione)

Common Four Ring
(Ypthima huebneri)

Common Crow
(Euploea core)

Striped Tiger
(Danaus genutia)

Danaid Eggfly
(Hypolimnas misippus)

Lemon Pansy
(Junonia lemonias)


Great Eggfly
(Hypolimnas bolina)


Common Baron
(Euthalia garuda)


Common Commander
(Moduza procris)

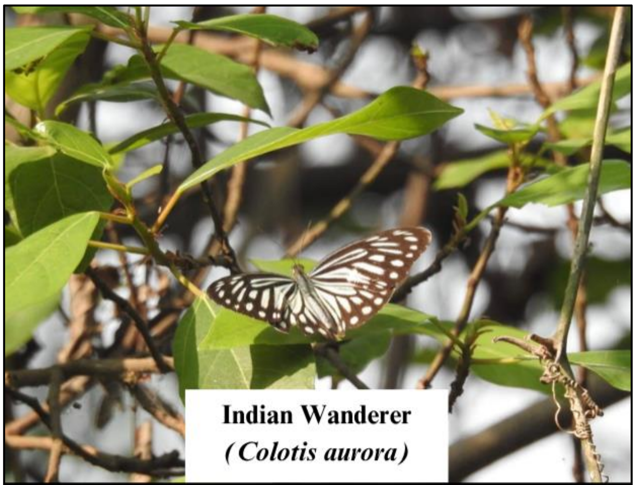

Glassy Tiger
(Parantica aglea)

Pieridae


Lemon Emigrant
(Catopsilia pomona)


Common Grass Yellow
(Eurema hecabe)

Psyche
(Leptosia nina)



Indian Wanderer
(Colotis aurora)

Mottled Emigrant
(Catopsilia pyranthe)

Indian Jezebel
(Delias eucharis)

Pioneer White
(Belenois aurota)

Papilionidae

Common Jay
(Graphium doson)

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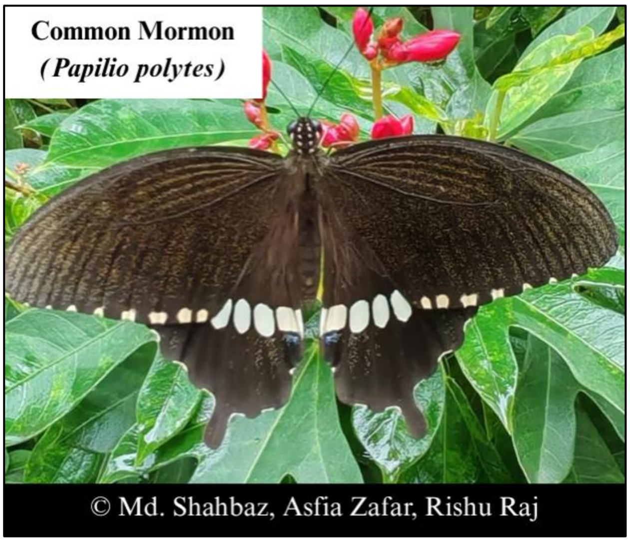

Common Mormon
(Papilio polytes)

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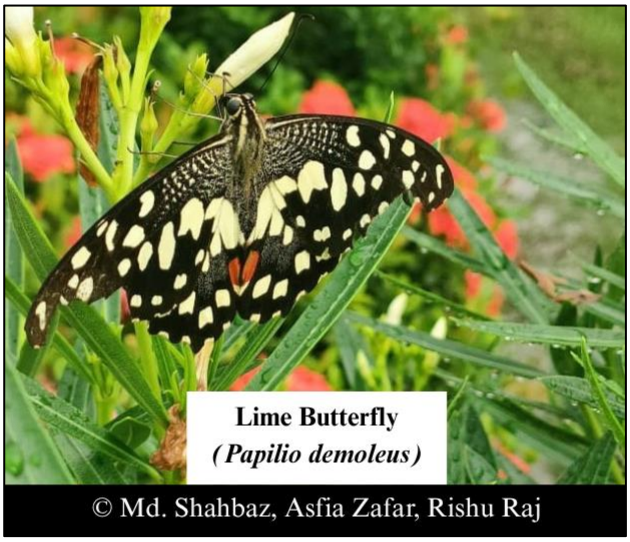

Lime Butterfly
(Papilio demoleus)

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Common Rose
(Pachliopta aristolochiae)

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