

## Occurrence of the pea blue *Lampides boeticus* (Linnaeus, 1767) (*Lepidoptera: Lycaenidae*), a schedule II butterfly, in the agro-ecological landscape of Bazpur, Kumaun Terai, Uttarakhand, India

Kamaldeep Shriwal<sup>1</sup>, Atul Upreti<sup>2\*</sup>

<sup>1</sup> Reseach Scholar, Department of Zoology, Government P G. College Bazpur, Udham Singh Nagar, Uttarakhand, India

<sup>2</sup> Assistant Professor, Department of Zoology, Government P G. College Bazpur, Udham Singh Nagar, Uttarakhand, India

### Abstract

The Pea Blue *Lampides boeticus* (Linnaeus, 1767) (*Lycaenidae*) is a widely distributed butterfly species of the Oriental Region and is protected under Schedule II of the Indian Wildlife (Protection) Act, 1972. Despite its wide range, very few verified records exist from the agricultural landscapes of the Kumaun Terai, Uttarakhand. This study documents the occurrence of *L. boeticus* in field-margin vegetation near Bazpur, Uttarakhand (29.180868° N, 79.16251° E; 220 m asl), The butterfly was photographed on 07 October 2025 at 17:46 h while nectaring on Lamiaceae flowers. The record contributes to the faunal documentation of the Terai region and highlights the conservation significance of margins of agricultural field.

**Keywords:** *Lampides boeticus*, *Lycaenidae*, pea blue, schedule II, Bazpur, Uttarakhand

### Introduction

Butterflies serve as valuable indicators of ecological health, habitat quality, and landscape connectivity [1]. India is home to about 1500 species of butterfly out of which more than 500 species are reported from Uttarakhand [10, 12, 18]. In India, the family *Lycaenidae* [2, 13] one of the largest butterfly families, encompassing several ecologically specialized taxa often associated with Fabaceae-dominated habitats [20]. Among these, the Pea Blue, *Lampidesboeticus* (Linnaeus, 1767), is an easily recognizable lycaenid. Although the species is common in some parts of India, it has received limited documentation from agricultural and peri-urban landscapes in the northern Terai region of Uttarakhand.

The Terai region forms an ecotone between Gangetic plain and Himalayan foothills. It supports a mosaic of forest patches, agricultural land, and dense human settlements [8, 16]. While the butterfly diversity of forested habitats within this zone such as Corbett Tiger Reserve and Rajaji Tiger Reserve and other sites of median to high altitude has been well documented [3, 4, 5, 9, 21], hardly any documentation of same exists on the butterfly fauna of agroecosystems of Terai region. Agricultural intensification, monocropping, and pesticide use are known to influence butterfly populations, yet field margins and semi-natural habitats continue to serve as important micro-refugia for pollinators and protected species [7, 11, 14, 15]. The present paper reports the occurrence of *Lampides boeticus* in field-margin vegetation of Bazpur, a semi-agricultural locality in the Kumaun Terai. The objective is to document its occurrence, habitat context, and potential ecological significance in relation to field margins of cultivated lands. The present study is the first verified photographic record of *L. boeticus* from Bazpur, Uttarakhand.

### Materials and Methods

#### 1. Study Area

The study was conducted at Bazpur (29.180868° N, 79.16251° E; 220 m asl), situated in Udham Singh Nagar District, Uttarakhand, India. The locality lies within the

Terai plains, approximately 7–10 km from Barhani range of Corbett Tiger Reserve. The land is characterized by fertile alluvial soil, irrigated agriculture, and patches of scrub vegetation. The regional climate is humid, subtropical with distinct monsoon and post-monsoon seasons. The field site consisted of land bordered by hedges, small shrubs, and herbaceous vegetation, typical of field-margin ecosystems of Terai region of kumaun

#### 2. Observation and Photography

The observation was made on 07 October 2025 at 17:46 h during post-monsoon season. The butterfly was photographed using a Oppo Reno 13, 50MP camera (Sony LYT-600 sensor) while nectaring on small Lamiaceae flowers (*Genus sp.*). The observation lasted approximately 20 seconds. No specimen was handled or collected. Only photographic documentation was obtained. Environmental parameters (temperature 28°C, light wind, clear sky) were recorded at the time.

### Results

#### 1. Taxonomy

**Order:** *Lepidoptera*

**Family:** *Lycaenidae*

**Subfamily:** Polyommatainae

**Genus:** *Lampides* Hübner, [1819]

**Species:** *Lampidesboeticus* (Linnaeus, 1767) Pea Blue

#### 2. Identification

The photographed butterfly (Fig.1) exhibits all diagnostic characters of *Lampidesboeticus* (Linnaeus, 1767) (Pea Blue; *Lycaenidae*). Body small and delicate; wingspan 26–30 mm. Underside pale brown, crossed by a series of thin, curved white striations across both forewing and hindwing. Hindwing with two distinct black tornal spots each crowned with orange and a single slender tail filament at vein 2. Narrow white discal and post-discal bands form a continuous pattern typical of *L. boeticus*. Antennae black with distinct white annulations, ending in a dark club with

orange tips. Head, thorax, and abdomen bluish-grey dorsally and whitish-grey ventrally. These features, confirm the identification as *L. boeticus* (Pea Blue) following standard published keys [14, 19].

### Discussion

A single individual of *Lampidesboeticus* was documented in field-margin vegetation dominated by Lamiaceae plant. The butterfly exhibited low and slow flight, visiting small purple flowers before resting momentarily with wings folded. The individual displayed characteristic features diagnostic of the species. The record represents the first verified photographic documentation of *L. boeticus* from Bazpur, Kumaun Terai region.

The proximity of the site (within 10 km) to Corbett Tiger Reserve suggests potential ecological connectivity between forest-edge and agricultural habitats. Field margins and semi-natural patches within farmlands may act as microhabitats supporting dispersal and persistence of lycaenids in modified landscapes

### 1. Ecological significance

*Lampidesboeticus* is a migratory species known for seasonal movements across Asia and Africa [18]. Its larval host plants include several legumes such as *Crotalaria*, *Trifolium*, *Medicago*, and *Pisum* species [14, 20]. The observation of this species in the field margins of Bazpur indicates the continued ecological function of such habitats. These marginal habitats may facilitate butterfly persistence and dispersal between protected forest patches, contributing to regional connectivity and pollination services and diversity of these field margins influence butterfly diversity [19]. Interestingly, the butterfly was observed nectaring on a Lamiaceae plant (Fig.1), indicating flexibility in its choice of nectar sources beyond the commonly reported Fabaceae species. This possible opportunistic foraging behavior reflects ecological adaptability in resource use within modified landscapes of Terai agro-ecosystem. Though a single sighting is not sufficient to draw firm conclusions, it certainly suggests a potential pollinator-plant association that requires further investigation.

### 2. Conservation implications

The species was included under Schedule II because it is highly seasonal and locally fluctuating in numbers, dependent on Fabaceae host plants for larval development, and vulnerable to pesticide use and habitat simplification in farmlands [6]. The species is subject to environmental pressures such as habitat loss, pesticide exposure, and climate variability [8]. Observations like the present one demonstrates that even modified agro-ecosystems can host legally protected butterfly species.

Such records reinforce the need to integrate biodiversity conservation into agricultural landscapes. Conserving vegetative margins, maintaining leguminous cover crops, and reducing chemical inputs could enhance microhabitats for butterflies and other pollinators. Community-based awareness among farmers about the ecological role of butterflies would further support conservation at the landscape level.

### 3. Comparison with previous records

Previous studies have reported *L. boeticus* from Dehradun, Nainital, and Corbett regions [17], but none from Bazpur or

its surrounding agro-ecological zone. Hence, this observation extends the known local distribution of the species westward within the Terai plains.

This study thus provides baseline data for future monitoring of butterfly populations in Uttarakhand's Terai belt and suggests the potential for long-term citizen-science-based faunal documentation in agroecosystems adjoining protected areas.

### Conclusion

The present record documents the occurrence of the Pea Blue, *Lampidesboeticus* (Linnaeus, 1767), a legally protected lycaenid, from the agro-ecological landscape of Bazpur, Uttarakhand. The observation highlights the role of field-margin vegetation as vital refugia for butterfly species. It also underscores the need for biodiversity inclusive agricultural management practices to maintain habitat heterogeneity and promote pollinator diversity in the Terai region. Continued monitoring and systematic surveys are recommended to assess the population status and seasonal occurrence of *L. boeticus* and related lycaenids. The observation of *L. boeticus* utilizing a Lamiaceae nectar source highlights its diverse behavior. Although based on a single record, it provides an important lead for future studies to examine this butterfly-plant interaction and evaluate its contribution to local pollinator ecology.



**Fig 1:** Pea Blue *Lampides boeticus* (Linnaeus, 1767) (*Lepidoptera: Lycaenidae*), A Schedule II Butterfly on Lamiaceae plant. (Photographed by Shriwal K. Photographed on 07 October 2025 at 17:46 hrs)

### Acknowledgements

The authors thank The Principal, Government P.G. College Bazpur, for institutional support and encouragement.

### Conflict of Interest

Authors declare no conflict of interest.

### References

1. An J, Choi S. Butterflies as an indicator group of riparian ecosystem assessment. *Journal of Asia-Pacific Entomology*, 2021;24:195–200. <https://doi.org/10.1016/j.aspen.2020.12.017>

2. Andrew ME, Wulder MA, Coops NC. How do butterflies define ecosystems? A comparison of ecological regionalization schemes. *Biological Conservation*,2011;144(5):1409–1418. <https://doi.org/10.1016/j.biocon.2011.01.010>
3. Arya MK, Dayakrishna. Species richness and diversity of butterflies in the landscape of Nandhaur Wildlife Sanctuary, Nainital, Uttarakhand. *Journal of Environment and Bio-Sciences*,2017;31(2):307–315.
4. Arya MK, Verma A, Tamta P. Diversity of butterflies (*Lepidoptera*: Papilionoidea) in a temperate forest ecosystem, Binsar Wildlife Sanctuary, Indian Himalayan Region. *Nature Environment and Pollution Technology*,2020;19:1133–1140. <https://doi.org/10.46488/NEPT.2020.v19i03.025>
5. Arya MK, Dayakrishna, Verma A. Patterns in distribution of butterfly assemblages at different habitats of Corbett Tiger Reserve, Northern India. *Tropical Ecology*,2020;61:180–186. <https://doi.org/10.1007/s42965-020-00077-7>
6. Bonebrake TC, Ponisio LC, Boggs CL, Ehrlich PR. More than just indicators: a review of butterfly responses to habitat disturbance and climate change. *Biological Conservation*,2010;143:1831–1841. <https://doi.org/10.1016/j.biocon.2010.04.044>
7. Braak N, Neve R, Jones AK, Gibbs M, Breuker CJ. The effects of insecticides on butterflies: a review. *Environmental Pollution*,2018;242:507–518. <https://doi.org/10.1016/j.envpol.2018.06.100>
8. Chanchani P, Lamichhane BR, Malla S, Maurya K, Bista A, Warriar R, *et al.* Tigers of the Transboundary Terai Arc Landscape: Status, distribution and movement in the Terai of India and Nepal. National Tiger Conservation Authority, Government of India, and Department of National Park and Wildlife Conservation, Government of Nepal, 2014.
9. Chandra H, Arya MK, Verma A. Biodiversity of butterflies (*Lepidoptera*: *Rhopalocera*) in the protected landscape of Nandhour, Uttarakhand, India. *Journal of Threatened Taxa*,2023;15(1):22448–22470. <https://doi.org/10.11609/jott.7519.15.1.22448-22470>
10. Dewan S, Acharya BK, Ghatani S. A new record of the lesser-known butterfly Small Woodbrown *Lethe nicetella* de Nicéville, 1887 *Lepidoptera*: *Nymphalidae*: *Satyrinae* from Khangchendzonga National Park, Sikkim, India. *Journal of Threatened Taxa*,2018;10(6):11775–11779. <https://doi.org/10.11609/jott.3987.10.6.11775-11779>
11. Gilburn AS, Bunnefeld N, Wilson JM, Botham MS, Brereton TM, Fox R, *et al.* Are neonicotinoid insecticides driving declines of widespread butterflies? *PeerJ*,2015;3:1402. <https://doi.org/10.7717/peerj.1402>
12. Kehimkar I. *Butterflies of India*. Bombay Natural History Society, Mumbai, 2016, 528.
13. Kunte K. *Butterflies of Peninsular India*. Universities Press Hyderabad and Indian Academy of Sciences, Bangalore, 2000, 254.
14. Mehra S. Management plan of Nandhaur Wildlife Sanctuary (2015–2016 to 2024–2025). Western Circle Office, Forest Department, Haldwani, Uttarakhand, India, 2015.
15. Öckinger E, Hammarstedt O, Nilsson SG, Smith HG. The relationship between local extinctions of grassland butterflies and increased soil nitrogen levels. *Biological Conservation*,2006;128:564–573. <https://doi.org/10.1016/j.biocon.2005.10.024>
16. Semwal RL. *The Terai Arc Landscape in India, Securing Protected Areas in the Face of Global Change*. WWF–India, New Delhi, 2005,47.
17. Singh AP. Associations of butterflies across different forest types in Uttarakhand, western Himalaya, India: implications for conservation planning. *Journal of Threatened Taxa*,2022;14(1):20346–20370. <https://doi.org/10.11609/jott.7711.14.1.20346-20370>
18. Sondhi S, Kunte K. *Butterflies of Uttarakhand – A Field Guide*. Bishen Singh Mahendra Pal Singh (Dehradun), Titli Trust (Dehradun), National Centre for Biological Sciences (Bengaluru), Indian Foundation for Butterflies (Bengaluru), 2018.
19. Sybertz J, Matthies S, Schaarschmidt F, Reich M, Haaren CV. Assessing the value of field margins for butterflies and plants: how to document and enhance biodiversity at the farm scale. *Agriculture, Ecosystems & Environment*,2017;249:165–176. <https://doi.org/10.1016/j.agee.2017.08.018>
20. Varshney RK, Smetacek P. *A Synoptic Catalogue of the Butterflies of India*. Butterfly Research Centre, Bhimtal and Indinov Publishing, New Delhi, 2015.
21. Verma A, Arya MK. Proposed multipurpose project at Pancheshwar in the Western Himalaya affects rich butterfly diversity: a conservation concern. *Journal of Insect Conservation*,2021;25:89–107. <https://doi.org/10.1007/s10841-020-00285-5>