

SHORT COMMUNICATION

A New Record of *Elymnias caudata* Butler, 1871 (Insecta: Lepidoptera: Nymphalidae) from Nagpur in Central India

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Funding: No specific funding was received for this work.

Potential competing interests: No potential competing interests to declare.

Abstract

Urban areas harbour diverse butterfly species in isolated and fragmented habitats such as parks, remnants of natural and semi-natural habitats and other such green areas. An Indian endemic nymphalid butterfly species, *Elymnias caudata* Butler, 1871 (tailed palmfly), has mostly been reported from south-western parts of the southern region of India. According to the previous record, this species is unknown from Nagpur, a city in Central India. Here, *Elymnias caudata* is recorded from Nagpur for the first time, and it shows that the distribution range of this species is wider than previously known. This is the northernmost record of *Elymnias caudata* in India.

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1. Introduction

As compared to other invertebrates, butterflies (Insecta: Lepidoptera) have been extensively observed, collected and studied by naturalists in the past, and ever since, the interest in conducting research on butterflies has only increased all over the world^[1]. Many butterfly species require good quality habitat for survival, and respond quickly to any adverse change in their habitat^[2]. Due to this reason, butterflies have been considered as useful bio-indicators for changes in habitat quality and for studying the impact of alterations in land-use^[3].

Tailed palmfly, *Elymnias caudata* Butler, 1871, which is a nymphalid butterfly, is an endemic species to India^[4]. India is rich in butterfly diversity, and about 1504 butterfly species are found in India, whereas, 167 butterfly species have been recorded from Maharashtra's Vidarbha region^[5], in which Nagpur, a densely populated urban area is located. As many as 145 species of butterflies including 51 species of family Nymphalidae have been recorded from Nagpur^[6]. The present study reports *Elymnias caudata* from Nagpur for the first time, thereby making a new addition to its butterfly fauna and also to the butterfly fauna of Central India.

2. Material and Methods

This study was conducted in S. M. M. College of Science (SMMCS) campus situated in Nagpur City (C. 21.1498°N 79.0806°E) in Central India. Nagpur is located in the North-east region of Maharashtra, the second largest state in India (Fig. 1). The SMMCS campus is located in eastern Nagpur, and spread over an area of around 25 acres with a lot of green space. The climate of Nagpur is tropical wet and dry, with dry conditions dominating most of the year. The monsoon season lasts from June to September with heavy rains during July and August. Summers are extremely hot, while the winters are mild^[7].

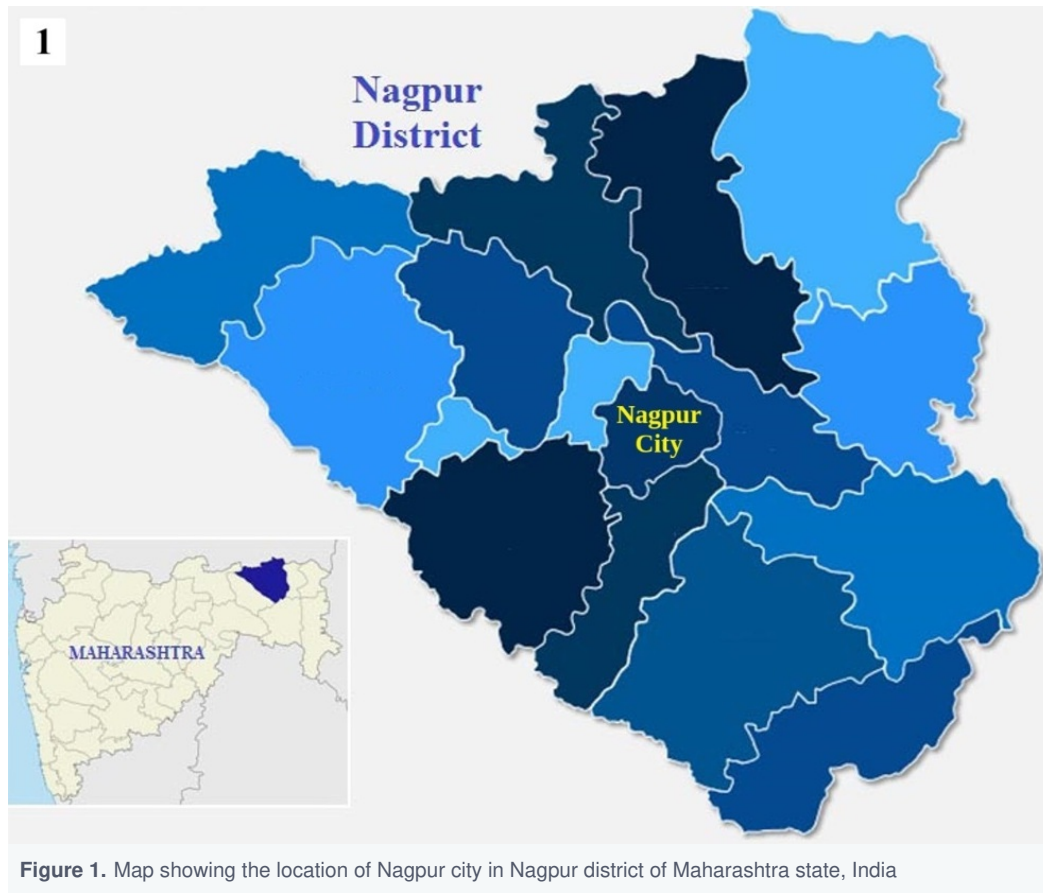


Figure 1. Map showing the location of Nagpur city in Nagpur district of Maharashtra state, India

In September 2024, a butterfly larva was observed in the SMMCS campus during the morning hours. The larva was not collected in order to preserve the local biodiversity. The larva was first photographed and subsequently identified with the help of the illustrated guides authored by Kehimkar^[8] and Ogale et al.^[9] as belonging to the butterfly species *Elymnias caudata*. Later, an adult female of this species was also observed and photographed in the campus garden, which helped in confirming the identification.

3. Results and Discussion

Elymnias Hübner, 1818 (Lepidoptera: Nymphalidae: Satyrinae) is a species-rich and widespread butterfly genus distributed throughout the Old World tropics^[10]. One of the species in this genus is the tailed palmfly, *Elymnias caudata*

(Figs. 2 - 4), which is distributed in the southern region of India^{[9][11]}. This species utilizes the ornamental palm *Chrysalidocarpus lutescens* (Family Arecaceae) for oviposition and as larval host^[12]. The butterfly diversity of Nagpur has been studied by various zoologists, however, none of them have previously recorded *Elymnias caudata* as occurring in Nagpur^{[5][6][13][14][15][16][17][18]}. Hence, the present report is the first record of this species from Nagpur. As this butterfly is known to be distributed only in Southern India, its occurrence in Central India where Nagpur is located, is an exciting find. Some ornamental plants of family Arecaceae, which are used as host plants by this butterfly species are growing in the SMMCS campus. These plants include *Areca catechu*, *Chrysalidocarpus lutescens*, and *Caryota urens* (Figs. 5 - 7). Thus the availability of larval host plants explains the occurrence of *Elymnias caudata* in the study area. This butterfly has also been reported from Ratnagiri and Sindhudurg districts located in the southern region of Maharashtra state^[9].



Figure 2. *Elymnias caudata* (female)



Figure 3. *Elymnias caudata* larva (dorsal view)



Figure 4. *Elymnias caudata* larva (lateral view)



Figure 5. *Areca catechu*



Figure 6. *Chrysalidocarpus lutescens*



Figure 7. *Caryota urens*

Elymnias caudata is sexually dimorphic, as males and females are different in appearance. Eggs are laid singly and the hatched larva shows five instars^[12]. The larva (Figs. 3 - 4) has a large dark brown head with two stout horns sloping backwards. The colour of the larva is bright green with distinct longitudinal yellow lines and two rows of large yellow spots tinged with green and sometimes tipped with black on the back, and prominent anal spines. The pupa is bright green, beautifully ornamented with four irregular rows of large yellow spots bordered with red^{[8][19]}.

Butterflies constitute an integral part of urban biodiversity, though urbanization is mostly responsible for the destruction and fragmentation of natural and semi-natural habitats, where small and isolated habitat remnants are surrounded by degraded and uninhabited areas^{[20][21]}. Butterfly species thought to be most representative of the original, predevelopment butterfly fauna progressively disappear as the sites become more urban^[22]. However, some research studies have also revealed that urban areas can harbour rich biodiversity, with parks and other green areas being important for preserving biodiversity in urban areas^{[23][24][25]}. Butterflies contribute to ecosystem services and thereby qualify as a group deserving conservation efforts, and the information on butterfly-plant links can be useful to sustain butterfly populations, and enhance conservation and management^[26]. The present study suggests that the availability of

host plants and favourable environmental conditions may help to extend the distribution range of some butterfly species such as *Elymnias caudata*.

Statements and Declarations

Conflict of interest

The authors declare that no competing interests exist.

Acknowledgements

We are thankful to the reviewers for their insightful suggestions, which have helped us to improve our manuscript.

References

- ^a Maes D, Van Dyck H (2001). *Butterfly diversity loss in Flanders (north Belgium): Europe's worst case scenario?* *Biological Conservation*. 99(3): 263-276.
- ^a Woiod IP, Thomas JA (1993). *The ecology of butterflies and moths at the landscape scale*. In *Landscape Ecology in Britain* (Ed. Haines-Young R) pp. 76-92. University of Nottingham: IALE (UK)/Department of Geography.
- ^a Croxton PJ, Hann JP, Greatorex-Davies JN, Sparks TH (2005). *Linear hotspots? The floral and butterfly diversity of green lanes*. *Biological Conservation*. 121(4): 579-584.
- ^a Varshney RK, Smetacek P (2015). *A Synoptic Catalogue of the Butterflies of India*. New Delhi: Butterfly Research Centre, Bhimtal & Indinov Publishing, New Delhi. p. 161.
- ^{a, b} Tiple AD (2011). *Butterflies of Vidarbha region, Maharashtra State, central India*. *Journal of Threatened Taxa* 3(1): 1469-1477.
- ^{a, b} Tiple AD, Khurad AM (2009). *Butterfly species diversity, habitats and seasonal distribution in and around Nagpur City, Central India*. *World Journal of Zoology*. 4(3): 153-162.
- ^a Nandankar PK, Dewangan PL, Surpam RV (2011). *Climate of Nagpur – Regional Meteorological Centre, Airport Nagpur*. https://web.archive.org/web/20160304071817/http://imdnagpur.gov.in/Climate_NGP.pdf. Accessed 23 September 2024.
- ^{a, b} Kehimkar ID (2008). *The Book of Indian Butterflies*. Oxford University Press.
- ^{a, b, c} Ogale HK, Kunte K, Saji K, Lovalekar R, Kale P (2024). *Elymnias caudata* Butler, 1871 – Tailed Palmfly. In Kunte K, Sondhi S, Roy P (Chief Editors). *Butterflies of India*, v. 4.12. Published by the Indian Foundation for Butterflies. URL: <https://www.ifoundbutterflies.org/elymnias-caudata>. Accessed 22 September 2024.
- ^a Aoki T, Yamaguchi S, Uemura Y (1982). *Butterflies of the South East Asian Islands, Vol. III: Satyridae, Amathusiidae & Libytheidae*. Plapac Co., Tokyo, 500 pp.

11. [^]Wei C-H, Lohman DJ, Peggie D, Yen S-H (2017). *An illustrated checklist of the genus Elymnias Hübner, 1818 (Nymphalidae, Satyrinae)*. *Zookeys*. 676: 47-152.
12. ^{a, b}Atluri B, Samatha B, Rayalu B, Deepika S, Reddi CS (2010). *Ecobiology of the South Indian palmfly, Elymnias caudata Butler (Lepidoptera: Rhopalocera: Nymphalidae: Satyrinae)*. *Proceedings of the National Academy of Sciences, India - Section B: Biological Sciences*. 80: 128-134.
13. [^]Kasambe R, Wadatkar J (2008). *Butterfly fauna in and around Nagpur city of Maharashtra*. *Indian Lepidoptera*. 4: 3-8.
14. [^]Tiple AD, Khurad AM (2009b). *Butterfly diversity of Seminary Hill, Nagpur (Central India) with their habitat and occurrence*. *Hislopia*. 1: 39-44.
15. [^]Tiple AD, Khurad AM (2010). *Butterflies of Ambazari garden and surroundings, Nagpur city, Maharashtra, India*. *Indian Forester*. 130: 1383-1391.
16. [^]Patil KG, Shende VA (2014). *Butterfly diversity of Gorewada International Bio-Park, Nagpur, Central India*. *Arthropods*, 3(2): 111-119.
17. [^]Gajbe PU (2019). *Diversity of butterflies (Lepidoptera) found around Sonegaon Lake, Nagpur, Maharashtra, India*. *Journal on New Biological Reports*, 8(3): 179-182.
18. [^]Gajbe PU, Badiye VH (2023). *Butterfly diversity in an urban area illustrates the significance of green spaces in urban biodiversity conservation*. *Arthropods*, 12(2): 111-119.
19. [^]Bingham CT (1905). *Fauna of British India. Butterflies Vol. 1*. pp. 173-174.
20. [^]Niemelä J (1999). *Ecology and urban planning. Biodiversity and Conservation*. 8: 119-131.
21. [^]McKinney ML (2002). *Urbanization, biodiversity and conservation*. *BioScience*. 52: 883-890.
22. [^]Blair RB, Launer AE (1997). *Butterfly diversity and human land use: Species assemblages along an urban gradient*. *Biological Conservation*. 80(1): 113-125.
23. [^]Barthel S, Colding J, Elmqvist T, Folke C (2005). *History and local management of a biodiversity-rich, urban cultural landscape*. *Ecology and Society*, 10(2): 10.
24. [^]Öckinger E, Dannestam Å, Smith HG (2009). *The importance of fragmentation and habitat quality of urban grasslands for butterfly diversity*. *Landscape and Urban Planning*. 93(1): 31-37.
25. [^]Faeth SH, Bang C, Saari S (2011). *Urban biodiversity: patterns and mechanisms*. *Annals of the New York Academy of Sciences*, 1223(1): 69-81.
26. [^]Mukherjee S, Banerjee S, Basu P, Saha GK, Aditya G (2018). *Butterfly-plant network in urban landscape: Implication for conservation and urban greening*. *Acta Oecologica*. 92: 16-25.