



First record of *Colotis amata* (Small Salmon Arab) from Pune District, Maharashtra, India

Vinod Borse*, Savita Bharati, Sadashiv Nimbalkar

BAIF Development Research Foundation, Pune, Maharashtra, India

Abstract

Butterfly distribution is strongly influenced by habitat structure, host plant availability, and seasonal Movement patterns. During a biodiversity survey conducted on 10 July 2024 at the BAIF Central Research Station campus, Urali Kanchan, Pune, Maharashtra, an adult individual of *Colotis amata* (Fabricius,1775), commonly known as the Small Salmon Arab, was recorded. The Individual was observed flying actively, resting on herbaceous vegetation, and feeding on nectar from *Tridax procumbens* within an open agriculture landscape characterized by mixed cropping and plantation systems. Although the species is widely distributed across the Indian subcontinent, its occurrence in the Pune district has not been clearly documented. This observation represents a new locality record and highlights the role of agro-ecosystem diversity, host plant distribution, and landscape heterogeneity in shaping butterfly occurrence and abundance. The record contributes to regional biodiversity documentation and emphasizes the importance of integrating ecological habitat features into agricultural practices and peri-urban landscapes.

Keywords: Host plant, abundance, vegetation, agricultural landscape, plantation, agro ecosystem

Introduction

Butterflies are widely recognized as sensitive bioindicators, reflecting subtle changes in environmental conditions, habitat quality, and landscape structure (Salmi *et al.*, 2025; Bonebrake *et al.*, 2010) [2, 14]. Their distribution and abundance are influenced by a combination of biotic and abiotic factors, including host plant availability, nectar resources, climate, and land –use patterns (Ehrlich & Raven, 1964; Dennis *et al.*, 2003) [4, 6].

The genus *Colotis* (Pieridae) comprises species typically associated with dry and semi-arid habitats, where larval host plants belonging to the family Salvadoraceae play a crucial role in sustaining population (Kunte, 2000; Larsen, 2005) [7, 9]. *Colotis amata* (Small Salmon Arab) is a widespread species known from multiple regions of India; however, its distribution at finer spatial scales remains poorly documented, particularly in rapidly changing landscapes.

Butterfly occurrence in agriculture and peri-urban ecosystems is increasingly shaped by land use transformation, including intensification of farming, urban expansion, and loss of native vegetation (Matson *et al.*, 1997; Tschamtk *et al.*, 2005) [10, 15]. These changes influence species-specific responses, often altering movement patterns, seasonal dispersal, and local abundance. Many pierid butterflies, including *Colotis* species, exhibit short-distance migration or dispersal behaviour in response to seasonal availability of host plants and nectar sources (Williams, 1930; Dover & Settele, 2009) [5].

The observation was made during a structured biodiversity survey conducted at the BAIF Central Research Station, campus, Urali Kanchan, Pune, Maharashtra, India, On 10 July 2024. The area represents a mosaic landscape consisting of agricultural fields, horticultural plantations, scattered trees, and semi-natural vegetation patches.

Butterfly observations were carried out through direct visual scanning during daylight hours under favourable weather conditions. Photographic records were collected with the help of a digital camera, and further species identification was based on the characters, including wing colouration,

patterns, size, and flight observations, by using standard field guides and an online database (Kunte,2000; Kunte *et al.*,2020; Bhakare *et al.*, 2018) [3, 7].

Habitat characteristics such as vegetation type, presence of flowering plants, and surrounding land use patterns were recorded. Particular attention was given to nectar sources and potential larval host plants in the vicinity.

An Adult individual of *Colotis amata* was recorded within the study site. The butterfly was observed flying actively across open patches, occasionally settling on low-growing vegetation. It was also seen feeding on nectar from *Tridax procumbens* a common flowering plant in disturbed and agricultural landscapes.

The identification was confirmed based on the characteristics: salmon-orange coloration, black-bordered forewings, and typical flight patterns associated with *Colotis* Species. (Bhakare *et al.*, 2018) [3].

Butterfly present in a given landscape is strongly linked to host plant availability. Species of *Colotis* are known to depend on plants such as *Salvadora persica*, and their distribution often mirrors the occurrence of these host species (Larsen, 2005) [9]. In the present area, the primary host plant recorded, the presence of diverse vegetation and nectar sources indicates a supportive environment.

Seasonal movement and dispersal behaviour are also critical in explaining such occurrences. Butterflies exhibit opportunistic movement patterns, especially in response to rainfall and vegetation flush (Williams, 1930). The observation of *Colotis amata* continued till October, in the surrounding area of host plants, specifically after the vegetation becomes drier. And the abundance drastically decreases.

Agriculture landscapes with mixed cropping, flowering plants, and reduced chemical inputs can provide important habitats for butterflies (Altieri, 1999; Nicholls & Altieri, 2013) [1, 11]. In contrast, monoculture systems and intensive land use often lead to reduced species richness and altered community composition (Matson *et al.*, 1997) [10]

Urban and peri-urban landscapes further influence butterfly diversity by modifying habitat structure and connectivity. Studies have shown that heterogeneous landscapes with green spaces, hedgerows, and flowering patches support higher butterfly abundance compared to highly urbanized areas (Ricketts, T.H *et al.*, 2008; Dover & Settle, 2009; Ramirez-Restrepo & MacGregor-Fors, 2017) ^[5, 12, 13]. The present record highlights how even small habitat patches within agriculture and peri-urban settings can support butterfly diversity when essential ecological resources are available.

The Documentation of *Colotis amata* from Pune district represents an important addition to the regional butterfly fauna. The observation underscores the roles of landscape heterogeneity, host-plant availability, and seasonal movement in shaping butterfly distribution.



Fig 1

References

1. Altieri MA. The ecological role of biodiversity in agroecosystems. *Agriculture, Ecosystems & Environment*,1999;74(1–3):19-31.
2. Bonebrake TC, Ponisio CL, Ehrlich PR. More than just indicators: A review of tropical butterfly ecology and conservation. *Biological Conservation*,2010;143(8):1831-1841.
3. Bhakare S, Ogale H. *A Guide to the Butterflies of Western Ghatsa (India)*, 2018.
4. Dennis RLH, Shreeve TG, Van Dyck H. Towards a functional resource-based concept for habitat: A butterfly biology viewpoint. *Oikos*,2003;102:417-426. [10.1034/j.1600-0579.2003.12492.x](https://doi.org/10.1034/j.1600-0579.2003.12492.x).
5. Dover J, Settele J. The influences of landscape structure on butterfly distribution and movement: a review. *J Insect Conserv*,2009;13:3–27. <https://doi.org/10.1007/s10841-008-9135-8>
6. Ehrlich PR, Raven PH. Butterflies and Plants: A Study in Coevolution. *Evolution*,1964;18(4):586–608.
7. Kunte K. *Butterflies of Peninsular India*. Indian Academy of Sciences, Bangalore. University Press, Hyderabad, 2000.
8. Kunte K, Sondhi S, Roy P, Chief Editors. *Butterflies of India*, v. 4.31. Indian Foundation for Butterflies Trust, 2026. <https://www.ifoundbutterfleis.org>.
9. Larsen TB. *Butterflies of West Africa*. Apollo Books, 2005.
10. Matson PA, Parton WJ, Power AG, Swift MJ. Agricultural intensification and ecosystem properties.

Science,1997;277(5325):504-9.

Doi:

[10.1126/science.277.5325.504](https://doi.org/10.1126/science.277.5325.504).

11. Nicholls CI, Altieri MA. Plant biodiversity enhances pollinators, Plant biodiversity enhances bees and other insect pollinators in agroecosystems. A review. *Agronomy for sustainable development*,2013;33:257-274. Doi: [10.1007/s13593-012-0092-y](https://doi.org/10.1007/s13593-012-0092-y).
12. Ramirez-Restrepo L, Mac Gregor-Fors I. Butterflies in the city: a review of urban diurnal Lepidoptera. *Urban Ecosystems*,2017;20:167-273-280. [10.1007/s11252-016-0579-4](https://doi.org/10.1007/s11252-016-0579-4).
13. Ricketts TH, Regetz J, Steffan-Dewenter I, Cunningham SA, Kremen C, Bogdanski A, *et al.* Landscape effects on crop pollination services: are there general patterns?. *Ecology Letters*,2008;11:499-515. <https://doi.org/10.1111/j.1461-0248.2008.01157.x>.
14. Salmi S, Moulai R, EL Hacene B, Baaloudj A. Can butterflies (Lepidoptera) serve as effective bio indicators for assessing the health of Algerian cedar forests? *EJE*,2025;122:287-301. <https://doi.org/10.14411/eje.2025.033>
15. Tschardtke T, Klein A, Kruess A, Steffan-Dewenter I, Thies C. Landscape perspectives on agricultural intensification and biodiversity—ecosystem service management. *Ecology Letters*,2005;8:857-874. [10.1111/j.1461-0248.2005.00782.x](https://doi.org/10.1111/j.1461-0248.2005.00782.x).
16. Williams CB. *The Migration of Butterflies*. Biological Monographs and Manuals, No. IX; Edinburgh and London: Oliver and Boyd, 1930, pp. xi+473, 71 figs. (All diagrams and maps). *Science*,1931;73:129-129. DOI:[10.1126/science.73.1883.129.a](https://doi.org/10.1126/science.73.1883.129.a)