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First sighting records of a butterfly species (Lepidoptera: Lycaenidae) from the area adjacent to Baidyabati canal, Hooghly, West Bengal, India

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Abstract

The paper reports a new citation record of a butterfly species, the Indian Pierrot (*Tarucus indica* Evans, 1932) for the first time in Baidyabati canal area, Hooghly district, southern West Bengal. The distribution of Indian Pierrot lies in central and peninsular India including the Brahmaputra plains but it has not been reported in the southern part of West Bengal, before.

Keywords: Butterfly diversity, lepidoptera, new record

Introduction

Biodiversity is subjected to burgeoning threats due to varied anthropogenic drivers (Ripple *et al.* 2017) [17] such as climate change, habitat modification, land use, pesticide application, light pollution and so forth (Crossley *et al.*, 2021) [5]. It impacts biodiversity as the ranges of the geographical distribution of species are predominantly determined by various climatic variables. Therefore, a shift in the range of abundance and distribution of species occurs due to a combinatorial effect of regional anthropogenic factors and climate change which in turn leads to alterations in the functioning and structure of ecosystems (La Sorte & Thompson, 2007) [13]. As a consequence, these ramifications result in the aggravation of the challenges in regulating and conserving biodiversity (Nunez *et al.*, 2019) [15]. For the understanding of the habitat requisites and protection of biodiversity, consistent field work needs to be conducted for the acquisition of precise data on the micro and macro habitats wherein the bioindicator species such as butterflies thrive (Ghazanfar *et al.*, 2016; Bhowal *et al.*, 2020) [9, 3]. Butterflies being poikilothermic animals are imperative organisms that aid in the understanding of changes in the environment, as the weather acutely controls their activity. Additionally, a precise adaptation to specific environmental conditions is accounted in prolific representatives of this category of species and their development is also dependent on specific food plants of larva as well as certain microhabitat configurations structures (Fleishman & Murphy, 2009) [7]. Similarly in a local context, the biological communities dependent on the climatic inclinations of the species are also triggered by climate change to undergo re-organization (Fourcade *et al.*, 2021) [8]. Furthermore, studies by Lee *et al.*, (2020) [14] indicated that susceptibility to climate change elevates when butterflies for survival are undergoing expansion in their range of original temperature and adapting to unparallelled local surroundings, thus in turn being compelled to bring about a shift in their ranges.

Over the course of surveys conducted using Pollard walk transect method (Pollard & Yates, 1993) [16] in Baidyabati at areas adjacent to the canal, (District Hooghly, West Bengal) in the year 2023, we sighted and photographed a species of butterflies for the first time in this area.

Materials and Methods

Study Area

The study was carried out at adjacent areas of Baidyabati Canal, Hooghly, West Bengal (22.80416 °N, 88.33392 ° E) in the pre-monsoon and monsoon seasons of the year 2023. The region extends over a vast area and is an arcadia for diverse flora and fauna including numerous migrant species. The average temperature of the area ranges from 33.49 °C (Winter) to 24.31 °C (summer), with RH: 41.39% (Minimum) to 79.81% (Maximum).

Sampling technique

Surveys were conducted periodically at Baidyabati in-order to acquire information on the diversity and abundance of butterflies through pictorial records of the region. A species of butterfly was spotted for the first time at Baidyabati. Two cameras (Nikon DSLR 5300 using Nikon lens of 55-300mm and Nikon DSLR 5500 using lens of 18-140mm) that the authors were carrying were used to capture photographs of the reported butterfly. The field-photographed butterfly species was verified and confirmed on the basis of external morphology in accordance with available literature. Earlier distribution of the butterfly species was established from Kunte *et al.*, 2020^[12].

Results

Description of the Species with new distributional records Indian/Transparent Pierrot (*Tarucus indica* Evans, 1932)

Class: INSECTA

Order: LEPIDOPTERA

Family: LYCAENIDAE

Subfamily: POLYOMMATINAE

Tribe: POLYOMMATINI

Genus: *Tarucus*

Species: *indica*

Distribution

Tarucus indica is distributed around Western Himalaya (Kumaon, Shimla), Peninsular India (Vashi, Chennai, Chinchoti, Deccan, Sundargarh, Satara, Mayurbhanj, Bhandup), Indus Plains (Multan Peshawar, Lahore, Karachi), West Indian semi-arid region (Chudela, Kathiawar, Kutch, Jodhpur), Central India (Jhansi, Nagpur, Satna), Baluchistan, Andaman Islands, Ganga-Brahmaputra Plains (Mynpoorie, Meerut, West Bengal) (Basu *et al.*, 2019)^[2] and in West Bengal, Brahmaputra plains comprise Cooch Bihar and West Dinajpur. *Tarucus indica* has not been observed in the Southern part of West Bengal. This species has no district records. The distribution record is given in Figure 2.

Description

The hind wing is tailed with the border of the upper forewing being broader (1mm). Under the hind wing, the central spot present in space 6 is closer to the spot of space 7 which is frequently joined and shifted inwards. The underwing

displays a band which is continuous, near to the marginally present row of spots and streaked markings. The forewing is more expanded with the outer margin straightened towards the lower tip (Figure 3). The upper wing of the male is light blue in colour, moderately transparent displaying the shadows of spots present in the underwing. At the end-cell, dusky spots are present in the upper forewing which are indistinct. In the dry season form, the upper forewing has a discal area which might be whitish in colour and the discal spot of the hindwing upper side which is possessed in spot 5 shows a broad distance from that of the post-discal band. The female is mostly brown in colour; the upper side base of the forewing bears blue scales. On both wings, the submarginal and discal areas have dark brown and white spots. In both sexes, the underwing displays streaks instead of spots which are black with white in colour (Kehimkar, 2008)^[10]. No subspecies are listed under this species.

Discussion

The study site, Baidyabati Canal area where the surveys were conducted has an arena of flora which sustains an enormous diversity of butterflies in-turn rendering the area to be an exemplary habitat for breeding. However, the butterflies face adverse impacts due to the climate change-mediated alterations in the environmental factors leading to a transition of the ranges of distribution of butterflies. Thus, resulting in the minimization of the availability of habitat for the species and thereby causing the extinction of the local populations (Chen *et al.*, 2011; Devictor *et al.* 2012)^[11, 6]. Till date, in India, 1504 species of butterflies have been identified, accounting for 8.7% of the world's butterfly species. Nonetheless, the population of butterflies in India are declining owing to several factors. It is predominantly on account of changes to climatic factors and anthropogenic activities that drive the species of butterflies to surpass their limit of tolerance (Basavarajappa *et al.*, 2018)^[1]. Furthermore, minimal knowledge of their life histories, as well as their habitat comprising their particular host plant preference diversities, jeopardizes the development and implementation of efficacious strategies of conservation. Henceforth, more such systemic studies need to be conducted to enhance the efficiency of evolving and employing conservation approaches for these sensitive bio indicator species (Bhowal *et al.*, 2020)^[3].

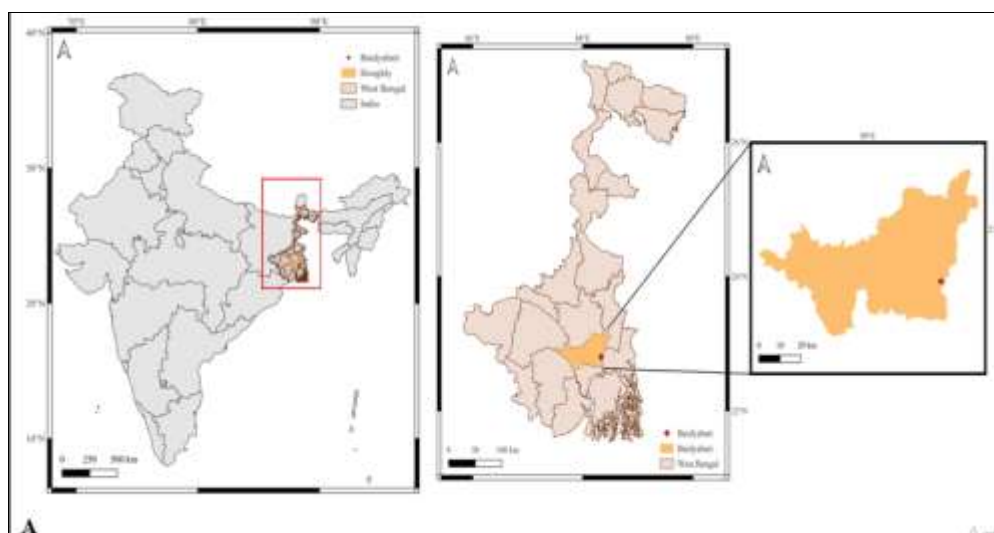




Fig 1: (A) Map of India showing the Baidyabati canal area (22.80416 °N, 88.33392 °E), Hooghly, West Bengal. (B) A satellite overview map (Google Earth) indicating the location of the study area

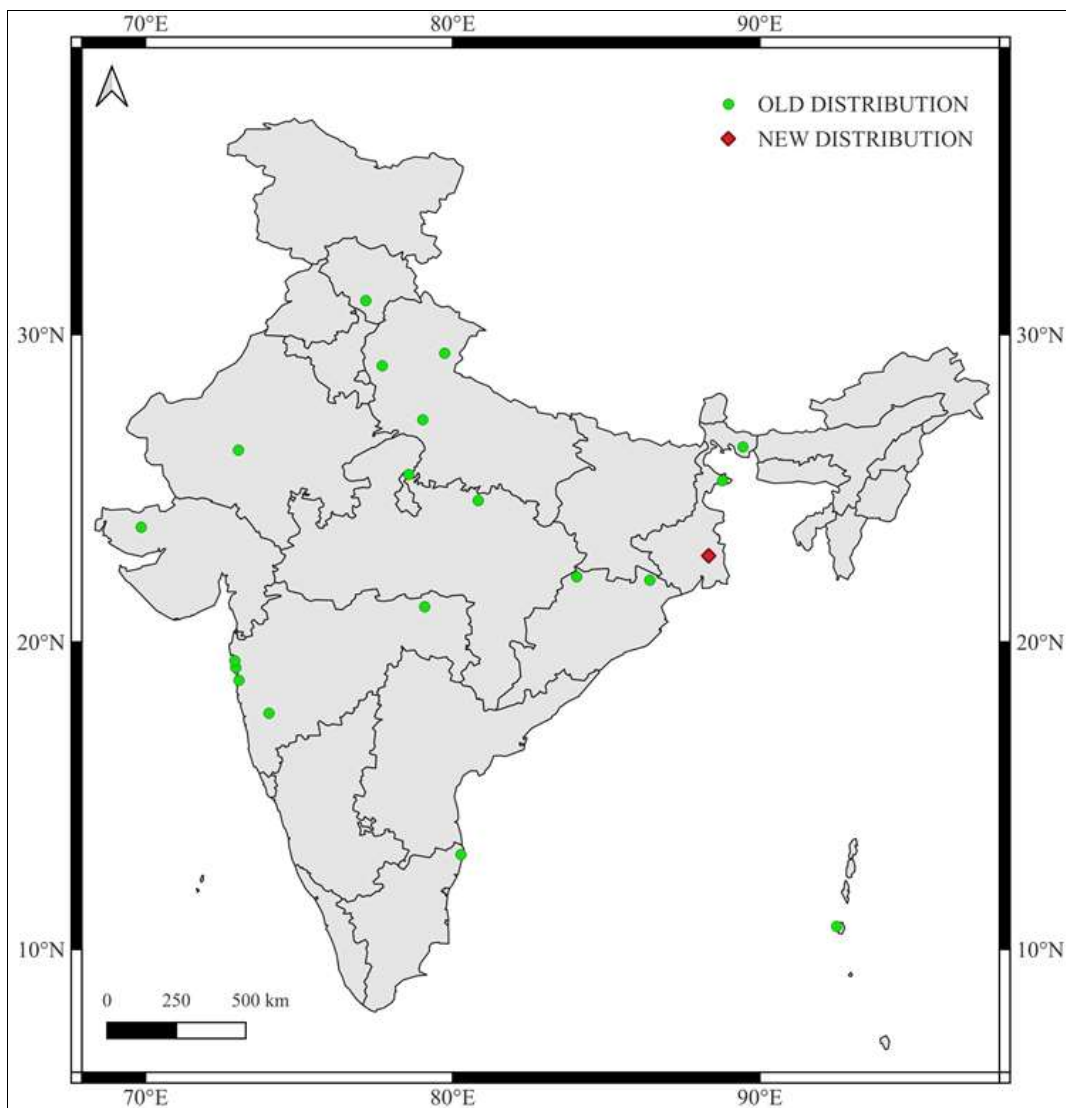


Fig 2: Earlier and new distribution record of Indian/Transparent Pierrot (*Tarucus indica* Evans, 1932) butterfly species



Fig 3: Female Indian / Transparent Pierrot (*Tarucus indica* Evans, 1932)

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