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First Record of *Dodona dipoea* (Hewitson, 1865) and *Zemeros flegyas* (Cramer, 1780) (*Lepidoptera*: *Riodinidae*: *Nemeobiinae*) from Madhya Pradesh, Central India

Dr. Shraddha khapre, Dr. Arjun shukla*
Faculty of Science, Department of Zoology, Government Homescience College, Jabalpur, Madhya Pradesh, India

Abstract
Butterflies are among the most sensitive and taxonomically well-studied insect groups, widely recognized as ecological indicators of habitat quality and environmental change. The family *Riodinidae*, though relatively species-poor in India, is biogeographically significant due to its restricted distribution and specialized habitat requirements. The present study documents the first confirmed record of two *Riodinidae* butterfly species, *Dodona dipoea* (Lesser Punch) and *Zemeros flegyas* (Punchinello), from Madhya Pradesh, Central India. Field surveys were conducted in the Bargi Dam catchment area, Jabalpur Division, during December 2024 to December 2025. *Dodona dipoea* was recorded on 24 December 2024, while *Zemeros flegyas* was observed on 02 January 2025. Identification was confirmed using standard morphological characters, wing pattern diagnostics and authoritative field guides. The occurrence of these species extends their known distribution into the central Indian landscape and highlights the ecological importance of the Bargi Dam catchment as a potential refuge for lesser-known butterfly taxa. These findings underline the need for focused biodiversity documentation and conservation planning in river-basin ecosystems of Central India.

Keywords: *Riodinidae*, new record, Central India, Bargi Dam, butterfly diversity, *Lepidoptera*

Introduction
Biodiversity represents the variety and variability of life on Earth and forms the foundation of ecosystem stability and resilience. Among insects, butterflies (*Lepidoptera*: *Rhopalocera*) are globally acknowledged as effective Bioindicators due to their short life cycles, habitat specificity, and sensitivity to microclimatic and anthropogenic changes (Pollard, 1977; Kunte, 2000) [7, 8]. *Lepidoptera* is the second largest insect order, comprising approximately 149,969 species worldwide (Catalogue of Life, 2021) [2], with India supporting nearly one-fifth of the global butterfly diversity. The family *Riodinidae* (Judies and Punches) is relatively less diverse in the Indian subcontinent compared to Neotropical regions, and its members are often localized, rare, and habitat-specialized (Varshney & Smetacek, 2015; Kehimkar, 2016) [5, 11]. Species of this family are considered indicators of undisturbed or semi-natural habitats, particularly forest edges, riparian zones, and bamboo-dominated landscapes.
Although butterfly diversity of Madhya Pradesh and the Narmada basin has been extensively studied (Singh, 1977; Chandra *et al*., 2007; Shukla & Maini, 2015; Flora *et al*., 2020; Bhandari *et al*., 2022; Khapre *et al*., 2025) [1, 3, 6, 9, 10], no confirmed record of *Dodona dipoea* or *Zemeros flegyas* exists from the state so far. The present paper reports the first occurrence of these two *Riodinidae* species from Madhya Pradesh, thereby filling an important biogeographical gap and contributing to the baseline data on Central Indian butterfly fauna.

Materials and Methods
Study Site
The study was carried out in the Bargi Dam catchment area within the Narmada River basin, located in Jabalpur Division, Madhya Pradesh, India. Bargi Dam is a multipurpose reservoir surrounded by heterogeneous landscapes comprising mixed dry deciduous forests, riparian vegetation, bamboo patches, scrublands, agricultural mosaics, and semi-urban habitats. The region experiences a humid subtropical climate with pronounced seasonal variations, which together create a wide range of microhabitats conducive to diverse butterfly assemblages.
The study area extended approximately 83 km from Bargi to Chutka and encompassed portions of Jabalpur and Mandla districts. Four sampling sites were selected for the present investigation, namely Bargi, Barela, Bijadandi, and Chutka. Among these, Bargi (Jabalpur District) and Chutka (Mandla District) were of particular significance, as the two-butterfly species reported in the present study were recorded exclusively from these locations within the Bargi Dam catchment area.

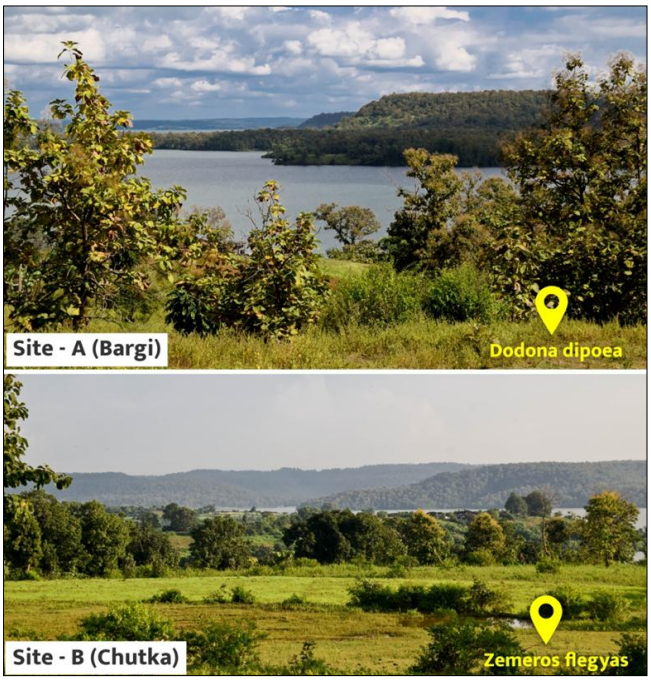
Survey and Observation
Field surveys were carried out through random visual encounter and transect methods during morning hours (09:00–12:00pm), coinciding with peak butterfly activity. Observations were made during December 2024 to December 2025. Butterflies were documented using a digital camera during field observations; while *Zemeros flegyas* was recorded exclusively through in situ photography, a single voucher specimen of *Dodona dipoea* was collected for taxonomic confirmation.

Identification and Taxonomic Confirmation
Species identification was based on external morphology, wing coloration, venation, and diagnostic characters, following standard literature and field guides (Wynter-Blyth, 1957; Kunte, 2000; Varshney & Smetacek, 2015; Kehimkar, 2016) [5, 7, 11, 12]. Nomenclature and systematic placement follow Varshney and Smetacek (2015) [11].
Zemeros flegyas (Cramer, 1780), commonly known as the Punchinello, belongs to the family *Riodinidae* and subfamily *Nemeobiinae*. The species is characterized by a bright orange-brown upperside with prominent black spots,

while the underside is purplish brown bearing small, scattered white spots; a distinct black spot is present on the inner side of the hindwing underside. The wingspan ranges from 35–40 mm and the species typically inhabit forest edges and shaded undergrowth (Wynter-Blyth, 1957; Kehimkar, 2016) [5, 12].

Dodona dipoea (Hewitson, 1865), commonly known as the Lesser Punch, is also a member of the family *Riodinidae* under the subfamily *Nemeobiinae* and is distinguished by its dark brown upperside marked with orange-brown bands, whereas the underside is pale brown with comparatively obscure markings. A key diagnostic character of this species is the presence of a UNF spot near the leading margin along the end-cell bar, which is slightly shifted inward. The wingspan of D. dipoea varies between 35–45 mm, and its larval host plant is reported to be Arundinaria species (mountain bamboo) (Varshney & Smetacek, 2015; Kehimkar, 2016) [5, 11]. During field surveys in the Bargi Dam catchment area, D. dipoea (IMAGE A). was recorded on 24 December 2024, while Z. flegyas (IMAGE B). was observed on 02 January 2025. Both species were encountered resting on low vegetation near shaded forest patches, suggesting the availability of suitable microhabitat conditions and relatively undisturbed ecological niches within the study area.

Image A–B: *Dodona dipoea* (A) and *Zemeros flegyas* (B), *Lepidoptera*: *Riodinidae* recorded for the first time from Madhya Pradesh, India



Site A–B: Habitat and Collection/Photographing Sites

Results and Discussion

The present study reports the first confirmed records of *Dodona dipoea* (Hewitson, 1865) and *Zemeros flegyas* (Cramer, 1780) from Madhya Pradesh, Central India, thereby significantly extending the known distribution range of these *Riodinidae* butterflies. *Dodona dipoea* (Lesser Punch) was recorded from the vicinity of the Bargi Dam (Site A), Jabalpur Division, while *Zemeros flegyas* (Punchinello) was documented from Chutka (Site B), a locality situated within Mandla District, both falling under the Bargi Dam catchment of the Narmada River basin. These locality-specific records provide concrete evidence of the occurrence of *Riodinidae* across the upper catchment zone of the Bargi reservoir.

A critical review of earlier faunistic literature confirms that neither species has been previously reported from Madhya Pradesh. Notably, the comprehensive butterfly inventory of Jabalpur City by Flora *et al*. (2020), published in the Journal of Threatened Taxa, which extensively surveyed urban and peri-urban habitats, does not list either D. dipoea or Z. flegyas. This absence from one of the most exhaustive regional surveys further corroborates the novelty and significance of the present findings.

Historically, the distribution of *Dodona dipoea* and *Zemeros flegyas* has been largely restricted to northeastern India, the Himalayan foothills, and select regions of the Western Ghats (Evans, 1932; Varshney & Smetacek, 2015; Kehimkar, 2016) [4, 5, 11]. Their non-detection in earlier Central Indian surveys may be attributed to genuine rarity, strict habitat specificity, or limited sampling of suitable microhabitats such as riparian forest edges, bamboo-dominated patches, and semi-forest landscapes. The present records from Bargi and Chutka emphasize the role of the Narmada river basin as a biogeographical transition zone capable of supporting specialized and lesser-known butterfly taxa.

Butterflies of the family *Riodinidae* are known to be particularly sensitive to habitat disturbance, microclimatic variation, and larval host-plant availability, and are therefore regarded as reliable indicators of habitat stability. The occurrence of these species in the Bargi Dam landscape suggests the presence of relatively stable microclimatic conditions and intact vegetation structure, including the availability of suitable larval host plants such as Arundinaria species in the case of D. dipoea. Previous studies from the Jabalpur and Narmada regions have consistently highlighted high butterfly diversity and emphasized *Lepidoptera* as effective environmental health markers (Shukla & Rai, 2016; Bhandari *et al*., 2022) [1]. The addition of these two riodinid species further strengthens the ecological value of the region.

The present findings underscore the urgent need for continued systematic faunistic surveys and long-term monitoring in Central Indian river-basin ecosystems, which are increasingly subjected to anthropogenic pressures such as tourism, urban expansion, and habitat modification. Documentation of such first records is crucial not only for refining regional biodiversity inventories but also for guiding conservation planning and habitat-management strategies within the Narmada basin.

Conclusion

The present communication reports two *Riodinidae* butterfly species, *Dodona dipoea* and Zemeros *flegyas*, for the first

time from Madhya Pradesh. These findings contribute significantly to the butterfly inventory of Central India and underscore the conservation value of the Bargi Dam catchment area. Systematic biodiversity documentation is essential for developing effective conservation and habitat-management strategies in the Narmada basin.

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