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continued on the back inside cover

Cover: A mesmerising Indian Luna moth *Actias selene* is dancing through the starry night (by Vincent van Gogh) moonlit sky, displaying its ballistic display of feather tail. Digital artwork by Vyshnavee Sneha Jaijar.

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SHORT COMMUNICATION

Lesser Blue-wing *Rhyothemis triangularis* Kirby, 1889 (Insecta: Libellulidae), a new addition to the dragonfly diversity of Rajasthan, India

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Abstract: The present study reports the first confirmed record of the Lesser Blue-wing *Rhyothemis triangularis* Kirby, 1889 from Udaipur District, Rajasthan, India. Previously unreported in the state, this finding significantly expands this dragonfly's known geographical range into a new area. During the wetland monitoring program in September 2024, an opportunistic sighting of a dragonfly was observed in Jhadol and Gogunda, two adjoining blocks (tehsils) of Udaipur District. The previous findings of this species are mainly from the high rainfall zone, but the present finding is from a drier zone of western India, having low rainfall. The findings contribute to the understanding of the species distribution and ecological preferences, particularly in semi-arid regions like Jhadol and Gogunda block of Udaipur District. These findings contribute to the natural history of the species and highlight the habitat quality and suitability for this species in low-rainfall areas.

Keywords: Habitat preference, new geographic record, Odonata, semi-arid zone, Udaipur, village pond, western India, wetland health assessment.

Development activities around waterbodies have negatively impacted the riparian vegetation and water quality (Córdoba-Aguilar et al. 2019). Dragonflies and damselflies (Odonata) are valuable bioindicators for assessing and monitoring aquatic habitats. These insects, with their sensitivity to environmental changes, can provide insights into water quality, habitat health, and the impacts of various stressors on aquatic ecosystems (Oertli 2008). The presence of some stenotopic species reflects the effect of vegetation structure, environmental parameters, water quality parameters, and pollutants. Odontesare considered as representatives of health of wetlands, running water, and ponds. Family Libellulidae is one of the largest families within the suborder Anisoptera, encompassing over 1,035 species across 144 genera worldwide (Paulson et al. 2024). The genus *Rhyothemis* is a member of the Libellulidae family, commonly referred to as flutterers due to their distinctive flight pattern. The genus includes 23 species, distributed across Africa, Asia, Australia, and the Pacific region. This species has a wide distribution, encompassing China, Hong Kong, India, Indonesia, Malaysia, the Philippines, Singapore, Sri Lanka, Thailand (Dow & Sharma 2010); Cambodia, and Myanmar (Nu & Bu 2019); Bangladesh, Bhutan, India, Nepal, Pakistan, and Sri Lanka (Kalkman et al. 2020; Hopkins 2024). In India *R. triangularis* has previously been recorded from the states like Assam, Himachal Pradesh, Kerala, Karnataka, Odisha, Tamil Nadu, and West Bengal (Mitra 2002; Dow & Sharma 2010; Sajan & Mohapatra 2014; Thakur & Mattu 2015; Dawn 2021; Sadasivan et al. 2022).

In India, the genus *Rhyothemis* is represented by four

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species: *Rhyothemis phyllis*, *R. plutonia*, *R. triangularis*, and *R. variegata*. Among these, *R. variegata* is the most widespread species within the country (Subramanian & Babu 2024).

In this context, the presence of *R. triangularis* in low-rainfall zones such as Jhadol & Gogunda underscores the ecological importance of these wetlands. It offers valuable insight into the species' distribution, habitat preferences, and resilience. As a bio indicator species sensitive to habitat quality and water conditions, its occurrence in this region suggests a relatively healthy wetland ecosystem despite the challenging climatic conditions. These findings enrich the understanding of the species' natural history and support future conservation planning by identifying key habitats outside its traditionally known range. .

Materials and Methods

During the wetland health study, a dragonfly survey was conducted as a part of water quality assessment, focusing on species richness, and abundance. The Tropic of Cancer passes below the southern edge of Udaipur District from Dungarpur and Banswara districts. The area adjacent to this line is frost-free hence suitable for insects, including dragonflies. Udaipur District experiences a semi-arid climate with an average annual rainfall of 600 mm. Temperatures fluctuate significantly between seasons, ranging from a minimum of 2 ^{0}C in winter to a maximum of 45 ^{0}C in summer.

An Odonata monitoring programme was conducted from August 2023 to September 2024 in Gogunda (24.846^0 N, 73.426^0 E) and Jhadol (24.461^0 N, 73.483^0 E) blocks of Udaipur District to assess the health of wetlands and streams. Dragonflies and damselflies were searched, identified, and noted from and around the various water bodies of the region. The data was recorded in the notebook. The odonate species along with their key identifying features, were documented and photographed using a Canon 5D mark III camera with a 100 mm fixed lens. Specimens were identified mainly based on the morphological characters and keys provided by Ramachandran & Raju (2020) and Anonymous (2024).

Results

While recording odonate species at a community

Image 1. A seasonal pond in Paneriyon-Ki-Bhagal Village, Jhadol Block, Udaipur District. © Anil Sarsavan.

Image 2. *Rhyothemis triangularis* at Barhamano-ka-Kherwada Village, Jhadol Block Udaipur District, Rajasthan. © Anil Sarsavan.

pond (24.461^0 N, 73.483^0 E) in Barhamano-ka-Kherwada Village, Jhadol Block, Udaipur District on 30 August 2024, one individual was observed and suspected to be *Rhyothemis triangularis* because of its wing colouration. Half of the wing area from the base was metallic blue, and the hindwing base was much broader than that of the forewings. This distinctive pattern confirmed it to be a member of the genus *Rhyothemis*. Based on key identification features, the observed dragonfly was confirmed to be *R. triangularis*. On 30 August 2024, a female *R. triangularis* was spotted in a pasture land approximately 500 m away from the Barhamano-ka-Kherwada village pond. Males and females are morphologically similar. Females are characterized by reduced, small anal appendages. Males exhibit a ventral abdominal bulge, prominent secondary genitalia near the thorax-abdomen junction, and large anal appendages, all absent in females. Later, on 02 September 2024, three females and one male *R. triangularis* were recorded in the bushes near a pond in Palidana Village (24.846^0 N, 73.426^0 E). One mating pair of *R. triangularis* was observed in the bushes near a pond in Paneriyon-Ki-Bhagal Village (24.833^0 N, 73.431^0 E) during the survey period. A total of seven *R. triangularis* individuals (two males and five female) were recorded perched on various vegetation (*Schoenoplectus* sp., *Chrysopogon zizanioides*, and *Parthenium hysterophorus*) in three locations of Gogunda and Jhadol tehsils of Udaipur District.

Discussion

R. triangularis, commonly called the Lesser Blue-wing, is a striking species known for its distinctive triangular wing markings. Previous studies reported *R. triangularis* inhabiting forest streams (Ramachandran & Raju 2020), the present findings indicate that it can also inhabit seasonal village ponds. All the surveyed ponds are seasonal and primarily used for livestock drinking purposes. All ponds exhibit a diverse mosaic of wetland habitats, supporting a variety of aquatic vegetation. Submerged plants, primarily *Limnophila* species, dominate the underwater environment. The free-floating vegetation is characterized by *Trapa natans*, while *Schoenoplectus* species are the most prevalent emergent plants. Shoreline and upland areas are primarily covered by *Chrysopogon zizanioides* and *Parthenium hysterophorus*. The surrounding landscape is a mosaic of agriculture, pasture, forests, small streams, and small ponds.

This finding significantly expands knowledge of

the geographic distribution of *R. triangularis* and its habitat preferences in village ponds of semi-arid area of Rajasthan. *R. triangularis* has been documented in various biogeographically zones across India, including the Western Ghats, Eastern Ghats, Deccan Peninsula, coastal zone, northeastern zone, and the Himalaya (Dow & Sharma 2010). All three current observations are spread across Gogunda and Jhadol block of Udaipur District, all within a 50 km radius. This demonstrates the species wider distribution throughout the area. The presence of *R. triangularis* species in village ponds, demonstrates the significance of community ponds for the conservation of such Odonata species. This is the first report from the semi-arid region, suggesting a potentially wider range for this species than previously thought.

Conclusion

This article presents the first record of *R. triangularis* from Udaipur, Rajasthan, India. The finding contributes to the understanding of the species' geographical range and habitat preferences. Further research is needed to assess the population status and ecological significance of *R. triangularis* in this kind of community-conserved ponds.

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Review

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