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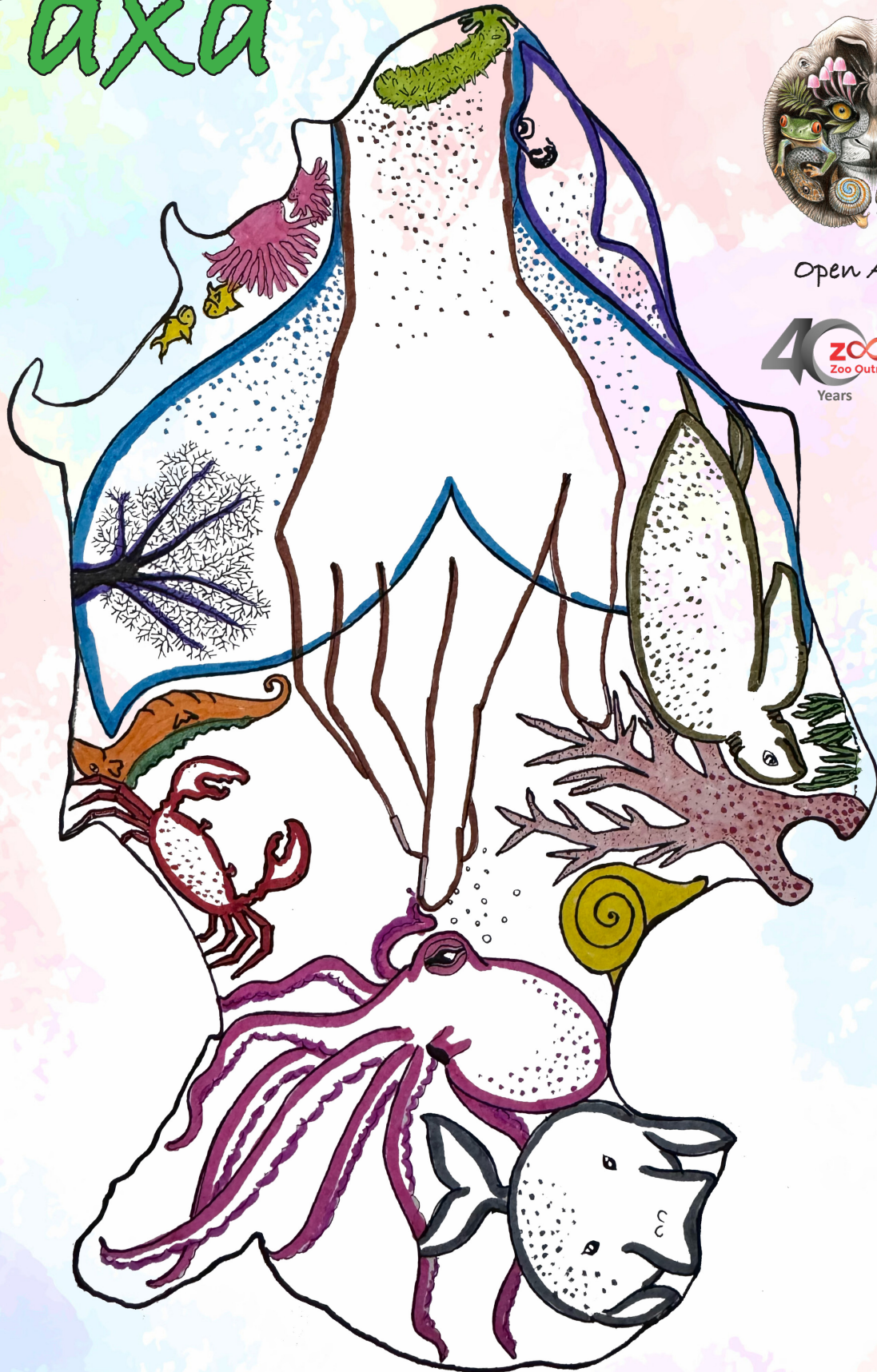
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continued on the back inside cover

Cover: Little Andaman is part of the island chain with incredible biodiversity, but these amazing species are threatened by development projects, and need our support.
Pen and ink artwork by Priyanka Iyer.



Sympetrum orientale (Selys, 1883) (Odonata: Libellulidae): a new addition to the Odonata fauna of Kashmir Himalaya, India

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Abstract: Odonata, which includes dragonflies and damselflies, are a significant insect group in wetland ecosystems, with 6,410 species globally, including 498 in India and 257 in the Indian Himalaya. These insects serve as indicators of ecosystem health and their population declines are often considered an indication of pollution or environmental degradation. The present study focuses on *Sympetrum orientale* (Selys, 1883), a new addition to the Odonata fauna of Kashmir Himalaya, India. It has been recorded from the Boniyar and Uri Regions of Baramulla District.

Keywords: Bioindicator, Boniyar, damselflies, dragonflies, first record, pollution, population decline, Uri, wetland.

Odonata, which includes dragonflies and damselflies, is a significant insect group in wetland ecosystems, with 6,410 described species globally, including 498 in India and 257 in the Indian Himalaya (Subramanian & Babu 2020; Schorr & Paulson 2024). Odonates are characterised by a delicate body and are frequently employed as markers of the health of ecosystems. Their diversity, abundance, and presence can be used to gauge the availability and quality of aquatic habitats, particularly water. Calvert (1898) conducted the first study on Kashmiri Odonata identifying 15 species, later expanded to 21 by Fraser (1933, 1934, 1936). Singh & Baijal (1954), Chowdhary & Das (1975), and Asahina

(1978) contributed more research on the Odonata fauna of Kashmir. Riyaz & Sivasankaran (2021) reported 10 species from the Hirpora Wildlife Sanctuary in Shopian, Kashmir; Qureshi et al. (2022) recorded 11 species from Pulwama District in Kashmir; Paray & Mir (2023) reported a total of 24 species of Odonata under 12 genera and five families from Kashmir; and Hussain et al. (2024) reported a total of 18 species of Odonata under 11 genera and four families in Hokersar wetland, a Ramsar site of Kashmir Himalaya, India. The genus *Sympetrum* Newman, 1833 under the family Libellulidae is a species-rich genus with 57 described species globally (Schorr & Paulson 2024). Species of this genus are mostly distributed in temperate areas of the Holarctic region (Pilgrim & von Dohlen 2012). Species like *Sympetrum arenicolor* Jödicke, 1994; *Sympetrum fonscolombii* (Selys, 1840); *Sympetrum haritonovi* Borisov, 1983; *Sympetrum hypomelas* (Selys, 1884); *Sympetrum meridionale* (Selys, 1841); *Sympetrum orientale* (Selys 1883); *Sympetrum speciosum* Oguma, 1915; and *Sympetrum striolatum* (Charpentier, 1840) are reported from the Indian Himalaya and other parts of India (Subramanian & Babu 2024).

The present survey was carried out during the months

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of July and September 2023 at eight selected sites in Kashmir Himalaya to study the odonate fauna of the region. During this study, *S. orientale* was documented from Boniyar (34.081 °N, 74.072 °E) and Uri (34.088 °N, 75.034 °E) regions of Baramullah District, the first report of this species from the region (Image 1); it was sighted and collected at slow-moving streams, rivers, ponds, and paddy fields (Figure 2). Photographs of specimens were taken using a Canon EOS 200D camera with 250 mm. The collected specimens are deposited in the museum with the accession number ZoolSo2223-Kash of the Department of Zoology, University of Kashmir.

MATERIALS AND METHODS

Study area: Kashmir is the northernmost region of India, covering an area of 15,948 km² and situated between 33.227–34.083 °N and 73.341–75.797 °E. Its southern and southwestern borders are formed by the Pir Panjal Range, whereas its northern and northeastern borders are formed by the northern Kashmir Range, which divide it from the icy plateau of Ladakh (Hussain 1987). During the present study a total of eight sites were selected from Baramulla District of Kashmir Himalaya, which is the northern part of Kashmir based on their geographical parameters. *Sympetrum orientale* (Selys, 1883) was reported from two sites of the selected ones during the months of July and September 2023, viz., Boniyar and Uri (Image 1).

Identification of the specimens

The identification of species was completed using taxonomic literature (Fraser 1933, 1934, 1936) and field guides (Subramanian 2009). Kalkman et al. (2020) and Subramanian & Babu (2017) were followed for species nomenclature and classification.

RESULTS

Systematic position

Order: Odonata

Suborder: Anisoptera

Superfamily: Libelluloidae

Family: Libellulidae

Genus: *Sympetrum*

Species: *S. orientale* (Selys, 1883).

Material examined: 4 females, 2 males, 34.081 °N, 74.072 °E, Boniyar, Baramulla, UT of Jammu & Kashmir, India, 1,577 m, 24.vii.2023, collected by Sahiba Khan. 2 females, 2 males, 34.088 °N, 75.034 °E, Uri, Baramulla, UT of Jammu & Kashmir, India, 1,721 m, 16.ix.2023, collected by Sahiba Khan and Beenish Bashir.

Diagnosis: Males are medium sized, head – labium reddish-brown, labrum dull red, occiput reddish-brown, eyes reddish-brown above paler below and laterally, thorax reddish-brown; dorsum bright red in colour and humeral and lateral sides light yellow with narrow black strips or lines; legs blackish; wings transparent palely enfumed with bright yellow colour amber marking at

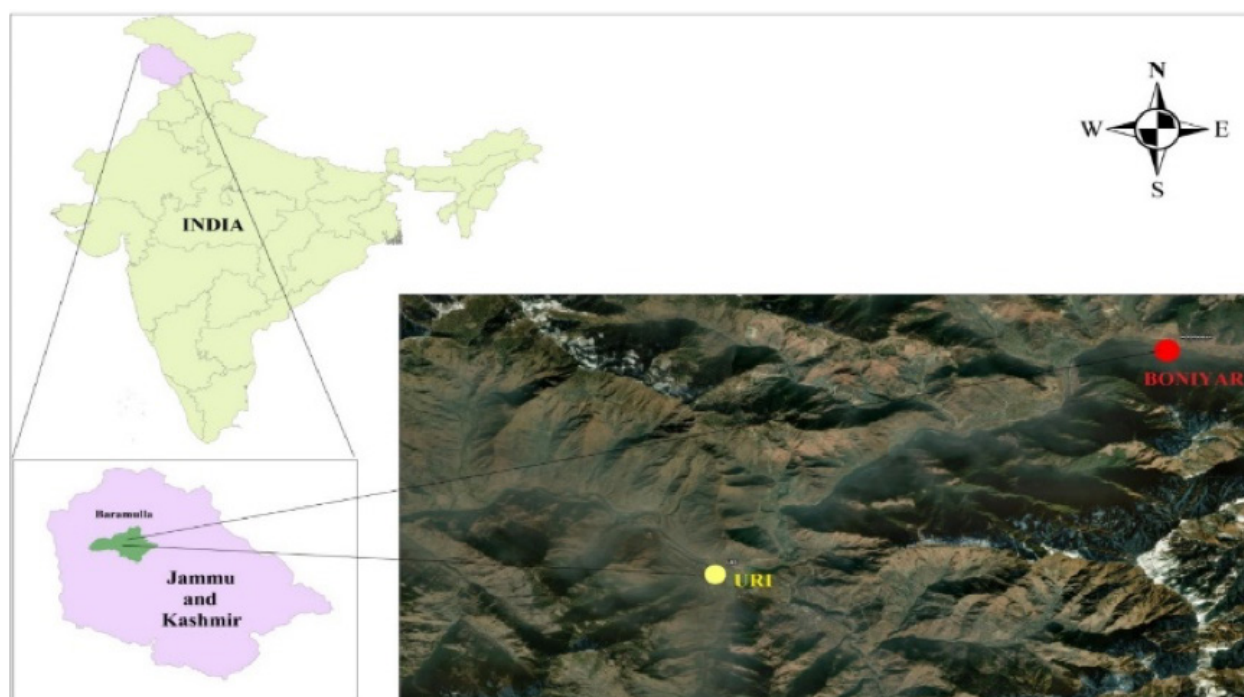


Image 1. Map of the study area where *Sympetrum orientale* was recorded.



Image 2. Habitat of *Sympetrum orientale*: A—Paddy field | B—Stream | C—Pond. © Sahiba Khan.

basis of wings, brighter red on dorsum and with humeral and lateral narrow black stripes or lines, the extent of which is variable – in forewing from base to half of the



Image 3. *Sympetrum orientale* (male): A—Lateral habitus of the dry preserved specimen | B—Dorsal view. © Tanveer Ahmad Dar.

cubital vein and first antenodal crossvein, in hindwing reaching up to cubital nervure or up to the discoidal cell and arc, wing membrane reddish-brown, pterostigma dark reddish-brown, abdomen dorsum reddish, ventral side black, black ventral side overlapping onto the sides in most of the abdominal segments, anal appendages reddish, black beneath (Image 3); female resembles with male, greenish antehumeral stripe, humeral stripe bordered dark reddish-brown, abdomen with black interrupted subdorsal stripes (Image 4). *S. orientale* is not widely distributed and abundant like its closely

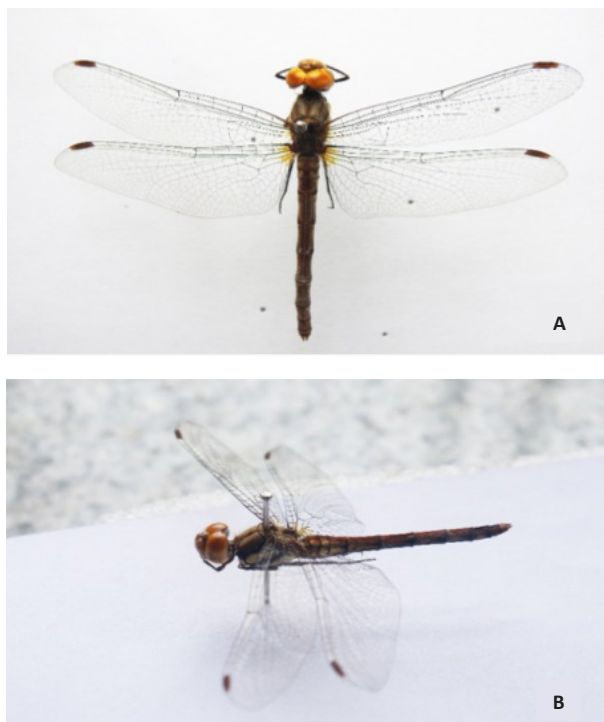


Image 4. *Sympetrum orientale* (female): A—Dorsal habitus of the dry preserved specimen | B—Lateral view. © Tanveer Ahmad Dar.

related species.

National and global distribution

It was previously recorded in Himachal Pradesh, Arunachal Pradesh, and Meghalaya (Mitra 2006; Babu & Nandy 2010). Recently the species has been reported from Mysore city of Karnataka (Suchitra & Chethan 2021) and in West Bengal (Dawn 2021). This study has reported this species for the first time from the Kashmir Himalaya region of India. Apart from India, the species is distributed in China and Nepal (Kalkman et al. 2020). The photographic proof of the species without its description was provided by Riyaz (2020) from the Shopian District of Kashmir Himalaya.

Habit and Habitat

The *Sympetrum orientale* (Selys 1883) is found near fresh water, such as lakes, ponds, canals, ditches, and riverbanks as well as near forest habitats.

Remarks

According to IUCN Red List status, the species fall under the 'Data Deficient' category. Regional documentation of odonates is important for their long-term conservation and management.

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