



First record of *Ourapteryx dierli* Inoue, 1994 (Lepidoptera: Geometridae: Ennominae) from India

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The genus *Ourapteryx* Leach, 1814 (Geometridae: Ennominae: Ourapterygini) is distributed in Europe and Asia, with over 75 described species (Lepidoptera Barcode of Life: Geometridae; Parsons et al. 1999). Ratnasingham & Hebert (2007) identified 89 *Ourapteryx* species in addition to 23 unidentified species. Hampson (1895) listed nine species of *Ourapteryx* (as *Urapteryx*, a junior synonym) from the Indian subcontinent. An unpublished compilation “A Checklist of Indian Geometridae” by Gunathilagaraj Kandasamy listed 13 *Ourapteryx* species, while Kirti et al. (2019) listed 24 species. In Nepal, Stüning (1994) and Inoue (1995) listed 17 *Ourapteryx* species. Stüning (2000) added three more species, bringing the Nepal list to 20 species. In Uttarakhand, adjacent to Nepal, only five species have so far been identified: *Ourapteryx clara* (Butler, 1880), *O. convergens* Warren, 1897, *O. ebuleata* (Guenée, 1858), *O. inouei* Stüning, 2000, and *O. sciticaudaria* (Walker, 1862) (Smetacek 2008; Sondhi & Sondhi 2016; Sanyal et al. 2017; Kirti et al. 2019).

The first author conducted opportunistic moth surveys between 2017 and 2019 in Sarmoli Village, Munsiri, Pithoragarh District, Uttarakhand. During

these surveys, *Ourapteryx dierli* Inoue, 1994, a moth species hitherto known only from Nepal, was recorded.

Sarmoli Village is located a kilometer from the town of Munsiri in Pithoragarh District, Uttarakhand. The village, which is located in the Kumaon region of Uttarakhand, is on an east-facing hill slope of the Greater Himalaya. The village is located in the Gori Ganga River basin, which flows through the landscape.

In 2017, moth screens using a 160W mercury vapour bulb were set up on 31.v.2017 at Emmanuel Theophilus’s home (30.078N & 80.231E, 2,291m) and on 2.vi.2017, at Anusuya Devi’s village homestay (30.07916N & 80.23535E, 2,200m). In 2018, a moth screen was set up on 22.v.2018 at Sarmoli Village using an 8W actinic tubelight at Hirma Devi’s homestay in Sarmoli village, no more than 50m from Anusuya Devi’s homestay. In 2019, a moth screen using a 160W mercury vapour bulb was set up on 22.v.2019 at Emmanuel Theophilus’s home (30.078N & 80.231E, 2,291m). No individuals of *Ourapteryx dierli* came to the screens mentioned above. On 23.v.2019 at Saraswati Devi’s homestay (30.079N & 80.235E, 2,200m), in Sarmoli village, a single individual of *Ourapteryx dierli* came to the moth screen at 2055

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Image 1. *Ourapteryx dierli*, male NCBS-BK945, collected on 23.v.2019 at Sarmoli, Muniari, Pithoragarh District, Uttarakhand. UP/UN.



Image 2. Genitalia of *Ourapteryx dierli*, male NCBS-BK945.



Image 3. *Ourapteryx dierli*, live individual, NCBS-BK945, photographed at Sarmoli, Muniari on 23 May 2019.

hours. The live individual was photographed and collected (Image 1, 3).

The area adjacent to the moth screen was a typical village vegetable garden growing legumes, citrus plants, and members of the Brassicaceae family. The area surrounding the village includes two Van Panchayats (Village Council Forests), the Sarmoli Jainti Van Panchayat covering 34ha, and the Sankhdura Van Panchayat covering 88ha. The primary vegetation surrounding the Sarmoli Village consists of West Himalayan Temperate forest with trees such as Deodar *Cedrus deodara*, Cypress (Cupressaceae), Horse Chestnut *Aesculus* sp., *Rhododendron* sp., Himalayan Oaks *Quercus* sp., Alder *Alnus nepalensis*, Maple *Acer* sp. and Ringal Bamboo.

Material examined: The specimen (NCBS-BK945) of the male *O. dierli* was collected by Sanjay Sondhi on 23.v.2019 from Sarmoli Village, Muniari, Pithoragarh District, Uttarakhand, India (30.07916N & 80.23535E, 2,200m) and is deposited in the Research Collections (<http://collections.ncbs.res.in/>) of the National Centre

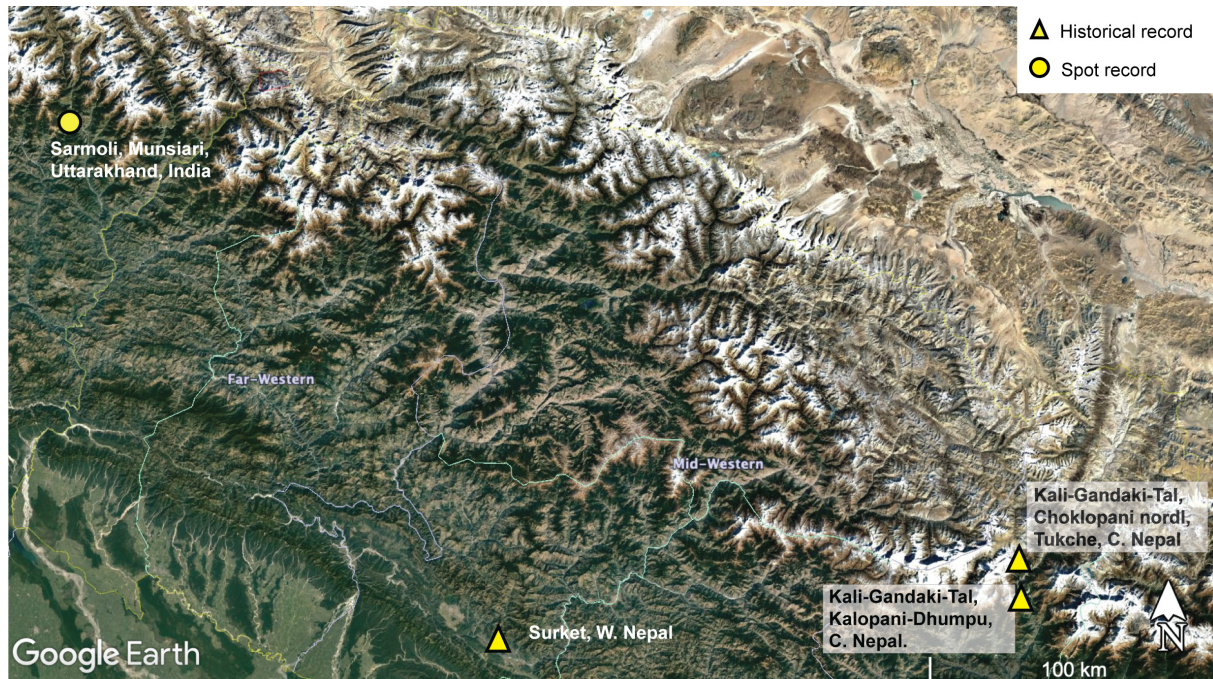


Image 4. Global distribution of *Ourapteryx dierli*.

for Biological Sciences, Bengaluru, India.

Adult moth description: Male. Voucher code NCBS-BK945 (Image 1). Forewing length 24mm. Upperside: forewing ground colour, greyish-brown. Forewing base is white. A broad, oblique white ante-medial band from costa to inner margin. Another broad, oblique post-medial band of similar width from costa to inner margin, the bands forming an incomplete V. Some diffused whitish costal striations between the two white bands. A narrow, white sub-marginal band and orange cilia. Hindwing tailed, with ground colour, greyish-brown. A white medial band widening from tornus to costa. At the costa, the white band merges with a broad white costal area. A large rufous-brown oval tornal patch, with three black spots at its outer edge, the uppermost of these black spots being red-centered. Inner margin of hindwing is narrowly white. A narrow, white sub-marginal band and orange cilia. Underside: forewing ground colour dirty white with bands above, showing through below. Mottled brown striations in the cell and the area surrounding it, as well as the area between the post-discal and sub-marginal white bands. A prominent brown band on the inner edge of the white post-medial band. A white sub-costal streak from near base to 2/3rd along costa. Hindwing ground colour dirty white with bands above, showing through below. A broad brown medial band from inner margin to costa. Mottled brown striations in the post-medial area. The

upper and underside markings of the male specimen are a good match to the original description of *O. dierli* (Inoue 1994). The only variability displayed when compared with the holotype is slightly broader white bands on both wings in the Uttarakhand individual, and the white costal striations, which are largely absent in the holotype.

Genitalia description: Genitalia dissection of the specimen by DNB revealed damaged uncus and distal tips of valves (corona and cucullus) in the Uttarakhand specimen (Image 2). Other parts of genitalia including aedeagus, asymmetric juxta, tegumen and proximal extent of valves, however, matched well with the original description (Inoue 1994). A redescription of the male genitalia, examining the Uttarakhand specimen NCBS-BK945 and the holotype is mentioned below:

Uncus falcate bent downwards at the distal end adhered to broad proximally rounded tegumen at the lateral profile. Vinculum slender and forms a sigmoid proximal margin in conjunction with tegumen. Saccus short, gnathos conjoined at the tip and form a lip shaped spinous lobe. Juxta elongates into characteristic furca acutely recurved inward from ventral angle and downward beneath the uncus from lateral angle. Distal tip of furca forms an ellipsoid spinous lobe from lateral angle. Valves are elongated with highly chitinized costal process rounded at the distal tip, and inner margin of corona laden with trichia. Aedeagus short with long

sub-zonal and with spinous cornuti.

Distribution: *Ourapteryx dierli* Inoue, 1994 was first described from central Nepal (Inoue 1994). The holotype and paratypes of this species were collected on various dates in vi.1973 at altitudes between 2,500–2,600 m from central Nepal (Inoue 1994, 1995). Subsequently, *O. dierli* was recorded from western Nepal at an altitude of 1,000m on 25.vii.1996 (Stüning 2000). These remain the only published records of this species. Hence the species' known range is now re-stated as eastern Kumaon in Uttarakhand, India, to western and central Nepal (Image 4).

Natural history: *Ourapteryx dierli* Inoue, 1994 has been recorded flying in the months of May, June and July only in India and Nepal. In India, the moth was attracted to a 160W mercury vapour bulb. There is no information about its early stages (Robinson et al. 2010). The species has been recorded on the wing at an altitudinal range of 2,400–2,600 m in eastern Kumaon and central Nepal, though a specimen was collected from western Nepal at 1,000m.

Existing publications on geometrid moths from India do not list *O. dierli* (Hampson 1895; Rose 2001; Smetacek 2008, 2009, 2011; Shubhalaxmi et al. 2011; Kirti et al. 2012, 2019; Sanyal et al. 2013a,b, 2017; Sondhi & Sondhi 2016; Kumar et al. 2018). SS has also surveyed moths widely across Uttarakhand and Himachal Pradesh in the last decade, and has never recorded this species. There are no published records of this species on the Moths of India website (Sondhi et al. 2020). Hence, our record of *O. dierli* extends its known range westwards into Uttarakhand in India.

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