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

Sanjay Sondhi 1, Dipendra Nath Basu 2 & Krushnamegh Kunte 3

1 Titli Trust, 49 Rajpur Road Enclave, Dhoran Khas, Dehradun, Uttarakhand 248013, India.
2, 3 Indian Foundation for Butterflies. C-703, Alpine Pyramid, Rajiv Gandhi Nagar, Bengaluru Karnataka 560097, India.

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 An unpublished compilation “A Checklist of Indian Geometridae” by Gunathilagaraj Kandasamy listed 13 *Ourapteryx* species, while Kirti et al.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, Munsiari, 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 Munsiari 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 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
First record of Ourapteryx dierli from India

Sondhi et al.
Journal of Threatened Taxa | www.threatenedtaxa.org | 26 September 2020 | 12(13): 16916–16919

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, Munsiari, 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 1. Ourapteryx dierli, male NCBS-BK945, collected on 23.v.2019 at Sarmoli, Munsiari, 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, Munsiari on 23 May 2019.
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 cucculus) 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...
First record of *Ourapteryx dierli* from India

Sondhi et al.

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.

**References**

Hampson, G.F. (1895). *The Fauna of British India including Ceylon and Burma. Moths*, Vol. 3 Taylor & Francis, London. Noctuidae (cont.) to Geometridae, 546pp, 226 figs.

Inoue, H. (1994). Description of a new species of *Ourapteryx* Leach Geometridae: Ennominae) from Central Nepal. *Tinea* 14 (1): 10–12.

Inoue, H. (1995). The genera *Abraxas* and *Ourapteryx* from Nepal (Geometridae, Ennominae), pp. 119–139. In: Haruta, T. (ed.). (1995). *Moths of Nepal*. Part 4. *TINEA*. Vol. 14 (Supplement 2). The Japan Heterocerists’ Society, Tokyo, 206pp+32pls.

Kirti, J.S., T. Goyal & M. Kaur (2012). An inventory of family Geometridae (Lepidoptera) from Western Ghats of India. *Journal of Entomological Research* 36(1): 83–94.

Kirti, J.S., K. Chandra, A. Saxena & N. Singh. (2019). *Geometrid Moths of India*, Nature Books of India, New Delhi, 296pp.

Kumar, M., P. Kumar & A. Kumar (2018). Taxonomic Study on Geometrid Moths (Lepidoptera: Geometridae) Diversity in Chir pine Forest of Himachal Pradesh. *Asian Journal of Advanced Sciences* 6(1): 49–53.

Parsons, M., M. Scoble, M. Honey, L. Pitkin & B. Pitkin (1999). *Geometrid Moths of the World: A Catalogue (Lepidoptera, Geometridae).* CSIRO, Clayton North, Victoria, Australia, 1016pp+index 129pp.

Ratnasingham, S. & P.D.N. Hebert (2007). BOLD: the barcode of life data system (www.barcodinglife. org). Molecular Ecology Notes 7: 355–364.

Robinson, G.S., P.R. Ackery, I.J. Kitching, G.W. Beccaloni & L.M. Hernández (2010). HOSTS – A Database of the World’s Lepidopteran Hostplants. Natural History Museum, London. https://www.nhm.ac.uk/our-science/data/hostplants. Accessed on 29 January 2020.

Rose, H.S. (2001). Inventory of the Geometrid Moths (Lepidoptera) of Patiala, *Bionotes* 3(1): 183.

Sanyal, A.K., V.P. Uniyal, K. Chandra & M. Bhardwaj (2013a). Diversity, distribution pattern and seasonal variation in moth assemblages along altitudinal gradient in Gangotri landscape area, Western Himalaya, Uttarakhand, India. *Journal of threatened taxa* 2(2): 3646–3653. https://doi.org/10.11609/JoTT.o2597.3646-53

Sanyal, A.K., V.P. Uniyal, K. Chandra & M. Bhardwaj (2013b). Diversity and indicator species of moth (Lepidoptera: Heterocera) assemblages in different vegetation zones in Gangotri Landscape, Western Himalaya, India, pp. 114–129. In: Uniyal, V.P. & A. Srivastava (Eds.) *ENVIS Bulletin: Wildlife and Protected Areas*, Vol. 14, Wildlife Institute of India, Dehradun, 232pp.

Sanyal, A.K., P. Dey, V.P. Uniyal, K. Chandra & A. Raha (2017). Geometridae Stephens, 1829 from different altitudes in Western Himalayan Protected Areas of Uttarakhand, India. (Lepidoptera: Geometridae). *SHILAP Revista de Lepidopterologia* 45(177): 143–163.

Shubhalaxmi, V., R.C. Kendrick, A. Vaidya, N. Kalagi & A. Bhagwat (2011). Inventory of moth fauna (Lepidoptera: Heterocera) of the northern Western Ghats, Maharashtra, India. *Journal of the Bombay Natural History Society* 108(3): 183–205.

Smetacek, P. (2008). Moths recorded from different elevation in Nainital district, Kumaon Himalaya, India. *Bionotes* 10(1): 5–15.

Smetacek, P. (2009). Additions and corrections to the list of moths recorded from different elevations in Nainital district, Kumaon Himalaya, India. *Bionotes* 11(4): 117–118.

Smetacek, P. (2011). Further Additions to the Moths (Lepidoptera: Heterocera) of Nainital District, Kumaon Himalaya, India. *Bionotes* 3: 4.

Sondhi, Y. & S. Sondhi (2016). A partial checklist of moths (Lepidoptera) of Dehradun, Mussoorie and Devalsari in Garhwal, Uttarakhand, India. *Journal of Threatened taxa* 8(5): 8756–8776. https://doi.org/10.11609/jott.2814.8.8756-8776

Sondhi, S., Y. Sondhi, P. Roy & K. Kunte (eds.) (2020). *Moths of India*, v. 2.00. Indian Foundation for Butterflies. https://www.mothsofindia.org. Accessed on 30 January 2020.

Stünig, D. (1994). On the identity of *Ourapteryx ebuleata* Guenee, 1857, *O. multistrigaria* Walker, 1866, and *O. caschmirensis* Bastelberger, 1911, with description of two new species (Lepidoptera: Geometridae, Ennominae). *Nachrichten des Entomologischen Vereins Apollo* (NF) 15: 109–134.

Stünig, D. (2000). Additional notes on the Ennominae of Nepal with descriptions of eight new species (Geometridae), pp. 94–152. In: Haruta, T. (ed.) *Moths of Nepal*. Part 6. *TINEA*. Vol. 16 (Supplement 1). The Japan Heterocerists’ Society, Tokyo, 163pp+14pls. Lepidoptera barcode of life: Geometridae (http://lepbarcoding.org/geometridae/ accessed on 28 January 2020)