

First Record of *Xenortholitha falcata* Yazaki, 1993 (Geometridae: Larentiinae) from India

Kaushik Mallick^{1,2,*}, Uttaran Bandyopadhyay^{1,2}, Arna Mazumder¹, Rushati Dey¹, Angshuman Raha¹,
Abesh Kumar Sanyal¹, Sandeep Kumar Gupta², Virendra Prasad Uniyal² and Kailash Chandra¹

¹Zoological Survey of India, New Alipore, Kolkata - 700053, West Bengal, India; Email: kaushik11.cc@gmail.com, uttaran25@gmail.com, arna318@gmail.com, rushati94@gmail.com, adroitangshuman@gmail.com, abeshsanyal@gmail.com, kailash611@rediffmail.com

²Wildlife Institute of India, Chandrabani, Dehradun - 248001, Uttarakhand, India; Email: skg@wii.gov.in, uniyalvp@wii.gov.in

Abstract

The genus *Xenortholitha* Inoue, 1944 is mainly distributed in the Sino-Japanese and Indian Himalayan Region (IHR). The current communication reports the first distributional record of *Xenortholitha falcata* Yazaki, 1993 from western Himalaya, India extending its range far westwards from its previously known range in Eastern Nepal. We provide a brief differential diagnosis of the species along with its habitus and male genitalia illustrations.

Keywords: Cidariini, Larentiinae, Lepidoptera Fauna, Range Extension, *Xenortholitha*

Introduction

The genus *Xenortholitha*, belonging to one of the largest tribes Cidariini of subfamily Larentiinae, was established by Inoue, 1944 with the type species *Cidaria propinguata* Kollar. Currently, the genus consists of 13 known species/subspecies worldwide including 3 species/subspecies from mainland India (Table 1). Inoue (1944) suggested the genus members to be separated from the ancestor genus *Ortholitha* Hübner, 1821 mainly based on the male genitalia characters, like the shape of uncus and valvae. Although the monophyly of the genus has not

yet been defined (Choi, 2004), the members of the genus can be easily diagnosed by having dark greyish wings, a smooth blackish postmedial line, a row of white dots on subterminal area and often having a strongly falcate forewing apex with an apical streak. The majority of the species are described from the Sino-Himalayan region, with few species known from Taiwan, Japan, Russia and Philippines. The species of the genus shows many geographical variations, most prominent in case of type species *X. propinguata* (Kollar, 1844), having 5 subspecies from Himalaya, Japan, Russia and Philippines.

Table 1. List of species/subspecies of genus *Xenortholitha* so far known from India with their distribution

Sl. No.	Species	Distribution	
		India	Global
1.	<i>Xenortholitha latifusata</i> (Walker, 1862)	Himachal Pradesh (Dalhousie), Uttarakhand	Pakistan, Taiwan
2.	<i>Xenortholitha propinguata propinguata</i> (Kollar, 1844)	Uttarakhand	Nepal, China, Japan, Korea, Mongolia, Russia, Tajikistan
3.	<i>Xenortholitha propinguata epigrypa</i> (Prout, 1939)	West Bengal (Darjeeling)	Nepal

* Author for correspondence

In the current communication, we report *Xenortholitha falcata* Yazaki, 1993, for the first time from India. The species was earlier known only from its type locality i. e. Godavari, Eastern Nepal and adjacent areas, the current record thus extending its distribution more westward.

Materials and Methods

Species were collected mainly from two biogeographic provinces of Indian Himalaya: Dharamsala and Great Himalayan National Park in Himachal Pradesh, North-West Himalaya (2A); Govind Wildlife Sanctuary and Askot Wildlife Sanctuary in Uttarakhand, West Himalaya (2B) (Figure 1). Collection was done using standard light trap method with a white sheet reflecting light from artificial light sources, mostly a combination of solar-powered Light Emitting Diode (LED) lamp of 48 W with 32 bulbs (1.5 W each) and Pressurized-Paraffin lamp (Petromax) of 80 W with white incandescent light. Collected specimens were pinned and spread following standard protocol (Dickson, 1976). For genitalia examination, abdomens of male specimens were soaked in 20% KOH solution overnight, followed by dissection in the next morning submerged in 20% Ethyl Alcohol under a Leica S8AP0 HD binocular microscope. A GARMIN Oregon-550 GPS device was used to record the GPS coordinates of the collection sites.

Abbreviations

TS: Type Species; FRH= Forest Rest House; Dist.= District.

Results

Taxonomic account

Genus *Xenortholitha* Inoue, 1944: 64 (TS: *Cidaria propinguata* Kollar, 1844)

Xenortholitha falcata Yazaki, 1993 (Figure 2A–2D)

1993. *Xenortholitha falcata* Yazaki, *Tinea*, 13(3): 110, pl. 59, fig.33, Holotype ♂, Nepal: Godavari.

Material examined: 1 ♂: India, Himachal Pradesh, Dist. Kullu, Great Himalayan National Park, Ropa FRH, 31.7655°N, 77.3576°E, 1515 m ASL, 03-iv-2018; 1 ♂: 23-iv-2018; 1 ♂: 19-ix-2019; 1 ♂: 23-ix-2019; 1 ♂: Padhar, 31.7499°N, 77.3732°E, 2437 m ASL, 19-vi-2018, leg. K. Mallick. 1 ♂: Dist. Kangra, Dharamsala, Cant. Road, 32.23165°N, 76.31414°E, 1492 m ASL, 24-x-2018; 1 ♂: 25-x-2018; 1 ♂:29-x-2018, leg. A. Raha & Team.

1 ♂: India, Uttarakhand, Dist. Uttarkashi, Govind Wildlife Sanctuary, Haltari, 31.0609°N, 78.1272°E, 2000 m ASL, 09-vi-2011; 1 ♂: Dist. Pithoragarh, Askot Wildlife Sanctuary, Chilamdhar, 30.13751°N, 80.24781°E, 1714 m ASL, 09-x-2017, leg. A.K. Sanyal & Team.

All the specimens were deposited in Himalayan Lepidoptera collection in Lepidoptera Section, Zoological Survey of India, Kolkata.

Description: Forewing length: 27 mm; Wings elongated with acute apex; forewing dark fuscous-brown; creamy-white sub-basal, antemedial and post-medial irregularly curved lines; the area between ante- and post-medial lines darker than overall ground-colour; a black, elongated discal streak; series of creamy-white submarginal dots, the largest and uppermost one just below costa; a small, dark apical streak; marginal series of paired, blackish

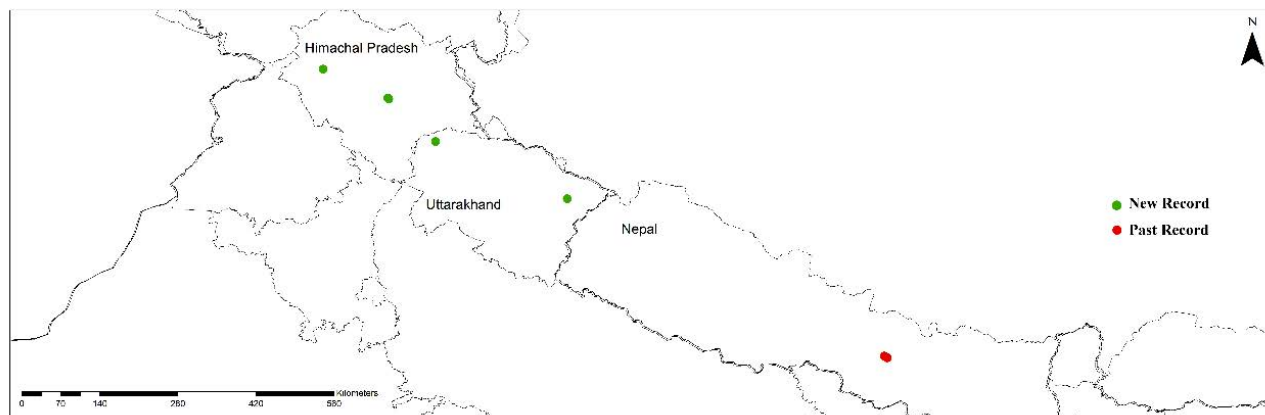


Figure 1. Collection localities of *Xenortholitha falcata* from Indian Himalaya.

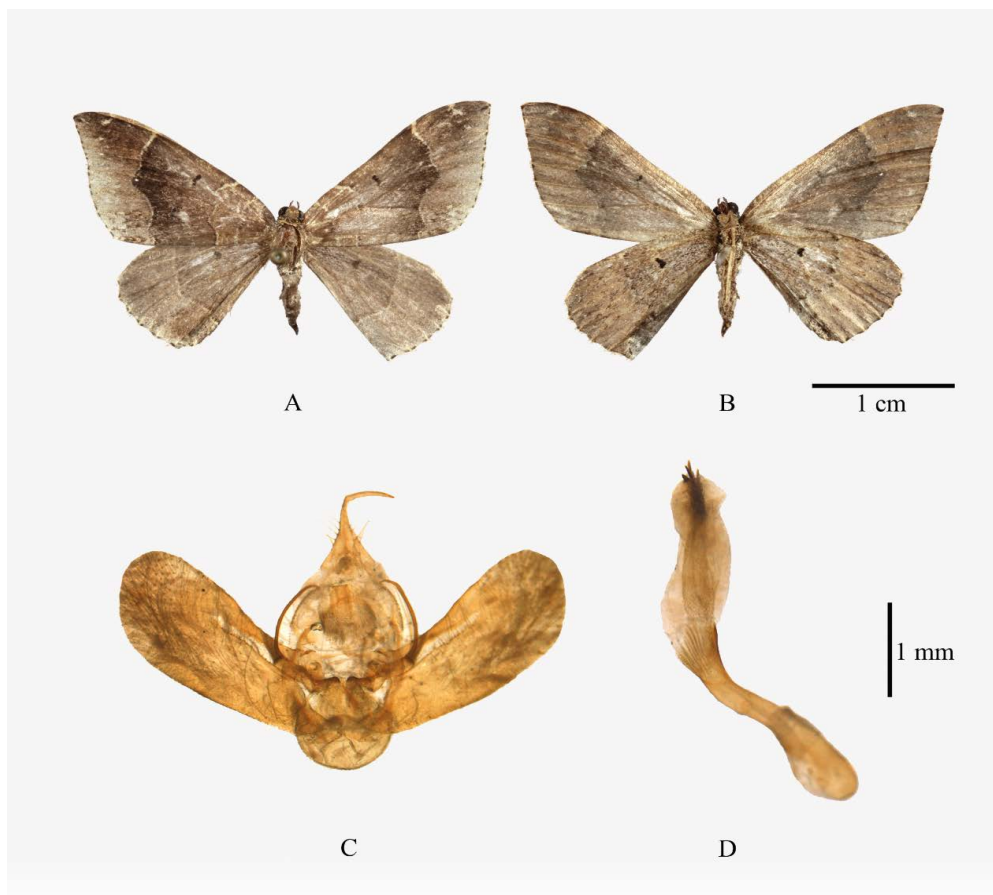


Figure 2. Habitus and male genitalia of *Xenortholitha falcata*. **A.** Upper side of ♂ **B.** Under side of ♂ **C.** Ventral view of male genitalia **D.** Aedeagus.

spots on each side of vein - endings; Hindwing paler brown with a creamy-white postmedial line, excurved on vein CuA_1 and a blackish, crescent-shaped discal spot. Underside of forewing more purplish-brown with dark suffusion in the medial area; postmedial line crenulated, with strong outward angulation at M_3 , below which it is concave up to $1A+2A$, on which it has another smaller angulation; series of submarginal dots as in upper side; a minute, black discal dot; underside of hindwing with highly crenulated, black post-medial line and large, black discal dot.

Uncus very long, broad at base, gradually becoming narrow with pointed tip; valvae spindle-shaped, with more or less roundish apex; a very slender, curved, long costal basal process reaching almost the base of uncus; saccus round; juxta moderately sclerotized and bifurcated medially. Aedeagus long, slender, basal part moderately sclerotized; vesica less sclerotized, with a bunch of small cornuti.

Diagnosis: *X. falcata* superficially resembles *X. propinguata epigrypa* (Prout, 1939); but the species can be easily distinguished based on the following characters: wing size much larger; forewing apex-strongly falcate, ground-colour of forewing dark fuscous brown instead of pale brown; discal dot larger, darker and more prominent; terminal area of forewing irrorated with grey instead of pale ochreous; Hindwing ground-colour pale fuscous-brown, darker than sister species. This species can be distinguished from *X. propinguata propinguata* (Kollar, 1844) by the much darker terminal area and lacking any triangular marking in the forewing apex. *Xenortholitha falcata* also differs from *X. latifusata* (Walker, 1862) by the hindwing discal spot not biangulate as in *latifusata*.

Xenortholitha falcata can be easily identified by its very long uncus, longer than the closely related sister species.

Distribution: Nepal, India (Himachal Pradesh, Uttarakhand) (New record).

Bionomy: The species was recorded within an altitudinal range of 1500 m to 2500 m, mostly in Himalayan Upper Chir Pine Forest habitat, sometimes also from Temperate Conifer forests. It was active all through the year, with individuals getting recorded in spring (March-April), summer (June) and post-monsoon (October) seasons.

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