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**REDISCOVERY OF *LETHE TRISTIGMATA* ELWES, 1887**

**(LEPIDOPTERA: NYMPHALIDAE: SATYRINAE)**

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**Rediscovery of *Lethe tristigmata* Elwes, 1887 (Lepidoptera: Nymphalidae: Satyrinae)****Sarika Baidya<sup>1\*</sup>, Souparno Roy<sup>1</sup>, Tarun Karmakar<sup>2</sup>, Archan Paul<sup>1</sup> & Arjan Basu Roy<sup>1</sup>**\*Correspondence: [bukun.nm@gmail.com](mailto:bukun.nm@gmail.com)ORCID: Sarika Baidya (<https://orcid.org/0000-0003-4345-8049>)Affiliations: <sup>1</sup> Nature Mates – Nature Club, 6/7, Bijoygarh, Jadavpur, Kolkata: 700032, India;<sup>2</sup>National Centre for Biological Sciences, TIFR, GKVK, Bellary Road, Bangalore 560065, India**Abstract**

*Lethe tristigmata* Elwes, 1887 is a rare and endemic butterfly belonging to the family Nymphalidae, subfamily Satyrinae, and has a very restricted global distribution. This species was first described as well as last reported from India in late 19<sup>th</sup> century. Our article reports the rediscovery of *L. tristigmata* after more than 121 years from Neora Valley National Park situated in Kalimpong District, West Bengal, India and also provides the first photographic evidence of a live individual of this species.

**Keywords**

Satyrinae, first record, butterfly, rediscovery, Neora Valley

**Introduction**

The genus *Lethe* Hübner, [1819] (Nymphalidae: Satyrinae) is globally represented by around 140 described species distributed worldwide; mostly across the Oriental region, south-eastern frontier of the Palearctic region and the western corner of the northern Australian region (Fruhstorfer 1911; D'Abbrera 1985, 1990a, 1990b, 1998; Bozano 1999; Lang 2019, 2020). In India, a total of 45 species have been recorded from this genus so far (Bingham 1905; Evans 1932; Talbot 1947; Lang & Bozano 2015; Varshney and Smetacek 2015; Lang & Lamas 2016; Gasse 2018; Lang 2020; Das *et al.* 2020). Some of them are rare with a restricted distribution along the eastern Himalaya and have a limited occurrence.

*Lethe tristigmata* Elwes, 1887 is a rare and endemic species which was first described from Sikkim in 1887 (Elwes 1887; Elwes 1888) and was last reported in the literature from there in 1889 (de Nicéville 1889). The syntype specimen of *Lethe tristigmata* collected from Sikkim in 1886 by Elwes is present in Natural History Museum, London and another specimen of the species is present in Museum Koenig (ZFMK), Bonn, Germany which was collected later in 1894 by R.P. Bretaudeau from Darjeeling, Sikkim. The descriptions of this species by several authors were based on museum specimens which are now more than 100 years old. There is no photographic documentation of a live individual of this species until now. We report its rediscovery after about 121 years from West Bengal, India and provide the first ever photographic evidence of a live individual. *Lethe tristigmata* is commonly known as 'Spotted Mystic' and it is legally protected in India under Schedule II of The Wildlife Protection Amendment Act, 2022 (Anonymous 2022).

**Historical records of occurrence**

*Lethe tristigmata* Elwes, 1887 was described based on the specimens collected by H.J. Elwes in July, 1886 from Tonglo, Sikkim (now 'Tonglu' is under Darjeeling district, West Bengal) at an elevation of 2600-2900 m. He did not observe female individuals at that time and as a result, the entire taxonomic description for *L. tristigmata* was written based on male

**Table 1:** List of *Lethe* species recorded from India.

	Scientific Name	Common English Name
1	<i>Lethe atkinsonia</i> (Hewitson, 1876)	Small Goldenfork
2	<i>Lethe andersoni</i> (Atkinson, 1871)	Anderson's Silverstripe
3	<i>Lethe baladeva</i> (Moore, [1866])	Treble Silverstripe
4	<i>Lethe bhairava</i> (Moore, [1858])	Rusty Forester
5	<i>Lethe brisanda</i> de Nicéville, 1886	Dark Forester
6	<i>Lethe chandica</i> (Moore, [1858])	Angled Red Forester
7	<i>Lethe confusa</i> Aurivillius, [1898]	Banded Treebrown
8	<i>Lethe dakwania</i> Tytler, 1939	White-wedged Woodbrown /Garhwal Woodbrown
9	<i>Lethe distans</i> Butler, 1870	Scarce Red Forester
10	<i>Lethe drypetis</i> (Hewitson, 1863)	Two-eyed Treebrown / Tamil Treebrown
11	<i>Lethe dura</i> (Marshall, 1882)	Scarce Lilacfork
12	<i>Lethe europa</i> (Fabricius, 1775)	Bamboo Treebrown
13	<i>Lethe elwesi</i> (Moore, 1892)	
14	<i>Lethe gemina</i> Leech, 1891	Silverline Treebrown / Tytler's Treebrown
15	<i>Lethe goalpara</i> (Moore, [1866])	Large Goldenfork
16	<i>Lethe gulnihal</i> de Nicéville, 1887	Dull Forester
17	<i>Lethe hyrania</i> (Kollar, [1844])	Common Forester
18	<i>Lethe jalaurida</i> (de Nicéville, [1881])	Small Silverfork
19	<i>Lethe kabrua</i> (Tytler, 1914)	Manipur Goldenfork
20	<i>Lethe kanjupkula</i> Tytler, 1914	Broken Woodbrown / Manipur Woodbrown
21	<i>Lethe kansa</i> (Moore, [1858])	Bamboo Forester
22	<i>Lethe lotiaris</i> (Hewitson, 1862)	Pale Forester
23	<i>Lethe lynxus</i> de Nicéville, 1897	
24	<i>Lethe maitrya</i> de Nicéville, [1881]	Barred Woodbrown
25	<i>Lethe margaritae</i> Elwes, 1882	Bhutan Treebrown
26	<i>Lethe mekara</i> (Moore, [1858])	Common Red Forester
27	<i>Lethe minerva</i> (Fabricius, 1775)	Branded Red Forester
28	<i>Lethe moelleri</i> (Elwes, 1887)	Plain Silverfork/ Moeller's Silverfork
29	<i>Lethe naga</i> Doherty, 1889	Naga Treebrown
30	<i>Lethe nicetas</i> (Hewitson, 1863)	Yellow Woodbrown
31	<i>Lethe nicetella</i> de Nicéville, 1887	Small Woodbrown
32	<i>Lethe ramadeva</i> (de Nicéville, 1887)	Single Silverstripe
33	<i>Lethe rohria</i> (Fabricius, 1787)	Common Treebrown
34	<i>Lethe sadona</i> Evans, 1932	Sadon Dark Forester
35	<i>Lethe satyavati</i> de Nicéville, [1881]	Pallid Forester
36	<i>Lethe scanda</i> (Moore, [1858])	Blue Forester
37	<i>Lethe serbonis</i> (Hewitson, 1876)	Brown Forester
38	<i>Lethe siderea</i> Marshall, [1881]	Scarce Woodbrown
39	<i>Lethe sidonis</i> (Hewitson, 1863)	Common Woodbrown
40	<i>Lethe sinorix</i> (Hewitson, [1863])	Tailed Red Forester
41	<i>Lethe sura</i> (Doubleday, [1849])	Lilacfork
42	<i>Lethe tristigmata</i> Elwes, 1887	Spotted Mystic
43	<i>Lethe verma</i> (Kollar, [1844])	Straight-banded Treebrown
44	<i>Lethe vindhya</i> (C. & R. Felder, 1859)	Black Forester
45	<i>Lethe visrava</i> (Moore, [1866])	White-edged Woodbrown

specimens (most of which were not in a fresh wing condition). Contemporarily, this species was also identified as a new species by Möller in 1885 and described by de Nicéville in a separate manuscript. Collectors of Möller also found fresh individuals of *L. tristigmata* from Sikkim during June, 1886. Later on, when de Nicéville came to know about the finding by Elwes, he offered his version of taxonomic description to Elwes to use it in his publication (Elwes 1887).

Otto Möller also collected a single female individual of *L. tristigmata* on 19<sup>th</sup> of July, 1888 from 'Kala Pookri' in Sikkim (now 'Kalipokhri' is in Singalila National Park, Darjeeling district, West Bengal) at an elevation of 3048 m. (de Nicéville 1889; Moore 1890-1892). Based on this specimen, de Nicéville described a female of *L. tristigmata* for the first time and published it in 1889 (de Nicéville 1889). After that, no occurrence of this species in the wild was reported from India until our recent observation.

*Lethe lyncus* de Nicéville, 1897 was described as the nearest allied species of *L. tristigmata* from Sikkim (India) having a smaller body size and less prominent male mark in the dorsal side of forewing (de Nicéville 1897). Later on, *Lethe lyncus* which is distributed from Sikkim, Manipur and Bhutan was included as a subspecies of *Lethe ocellata* (Poujade, 1885) from China (Evans 1932; Talbot 1947) and *Lethe lyncus* is now recognized as a distinct species (Lang 2020).

### ***Lethe tristigmata* Elwes, 1887 - Spotted Mystic**

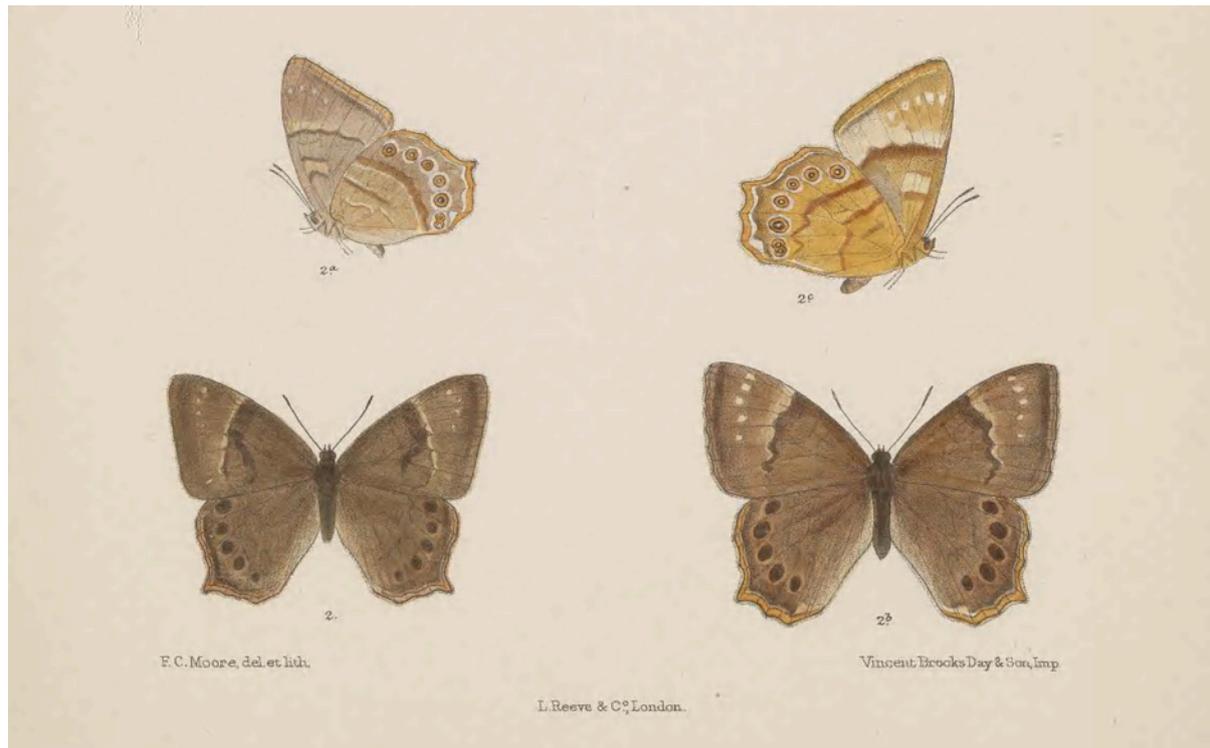
*Lethe tristigmata* Elwes, 1887: p. 444 [occurrence record and description]; Elwes, 1888: p. 318, pl. VIII, fig. 1 [catalogue and illustration]; de Nicéville 1889: p. 163 [description]; Moore 1890-92: p. 286, pl. 89, figs. 2, 2a-2c [= *Kerrata tristigmata*; description and illustration]; de Nicéville 1897: p. 545 [nearest allied species]; Bingham, 1905: p. 96 [description].

**Etymology:** Greek *tri* three; *stigmata* derived from Latin *stigmat*, referred to a mark or brand left by a hot iron perhaps referring to the three dusky-brown bar like markings (two in the discal cell and one discal band) present on the ventral side of the forewing.

**Habit and Habitat:** Dwells in and around dense bamboo thickets and cloud forest (reported as 'low dripping forest' in the original description); often settling on forest tracks (as occurs in other *Lethe* species); moderate to slow flight. Females are believed to conceal within denser bamboo thickets and forest patches, thus are much less frequently encountered (Elwes 1887; personal observation).

**Description: Male.** *Dorsal aspect:* Forewing brown, with a series of 4-5 subapical small ochreous spots. Discal cell with two dusky-brown bars one at the middle and other one towards the apex. The discal band of the ventral side showing through by transparency. Male has an irregular dark brown broken band from vein 1 to vein 4. *Hindwing* brown, an obscure irregular discal band, a series of postdiscal dark brown round spots. Two fine dark marginal lines enclosing an obscure ochreous line (Figure 1). *Ventral aspect:* Both wings paler ochreous brown. *Forewing*, discal cell has two dusky-brown bars as on dorsal side, enclosing a paler space. A dark brown irregular discal band from the costa towards apex, a series of 4-5 subapical small white spots, a very fine ochreous marginal line. *Hindwing* caudate at vein 4, a series of six postdiscal ocelli, an irregular discal band with diffused inner edge. A fine violet-white marginal line (Elwes 1887; de Nicéville 1889, Moore 1890-1892). **Female.** *Dorsal aspect:* Both wings similarly coloured as male but a bit paler in appearance. *Forewing* brown, with two dusky-brown bars, one at the middle and one towards the end of the discal cell enclosing a paler space. The sinuous discal narrow band dark and distinctly defined towards outside. A series of 4-5 subapical white spots arranged from costa to the second median interspace, larger and sharply defined. *Hindwing* brown with a brighter ochreous tint compared to a male, discal band and postdiscal series of round spots same as in male, but larger and more distinct. Two dark distinct marginal lines enclosing a ferruginous line. *Ventral aspect:* Both wings paler brown with clear and brighter ochreous tint. *Forewing* and *Hindwing* with markings similar to that of male but bands and spots are larger and more distinctly defined (De Nicéville 1889; Moore 1890-1892).

*Wing span:* Male. 55 mm; Female. 60mm (Moore 1890-1892).



**Figure 1:** Illustration of *Lethe tristigmata* adapted from Moore 1892 depicting Dorsal UPW of Male (2), Ventral UNW of Male (2a), Dorsal UPW of Female (2b), Ventral UNW of Female (2c). UPW = Upper Wing; UNW = Under Wing.

**Distribution:** All the previous locality records, as mentioned above, are currently located in West Bengal. Our sighting is also from this state. Thus, it can be safely suggested that, until now, *Lethe tristigmata* has a distribution restricted to West Bengal, India (Elwes 1887; de Nicéville 1889; Moore 1890-1892).

**Status:** Rare. Encountered only once in Neora Valley National Park, West Bengal, India in recent times.

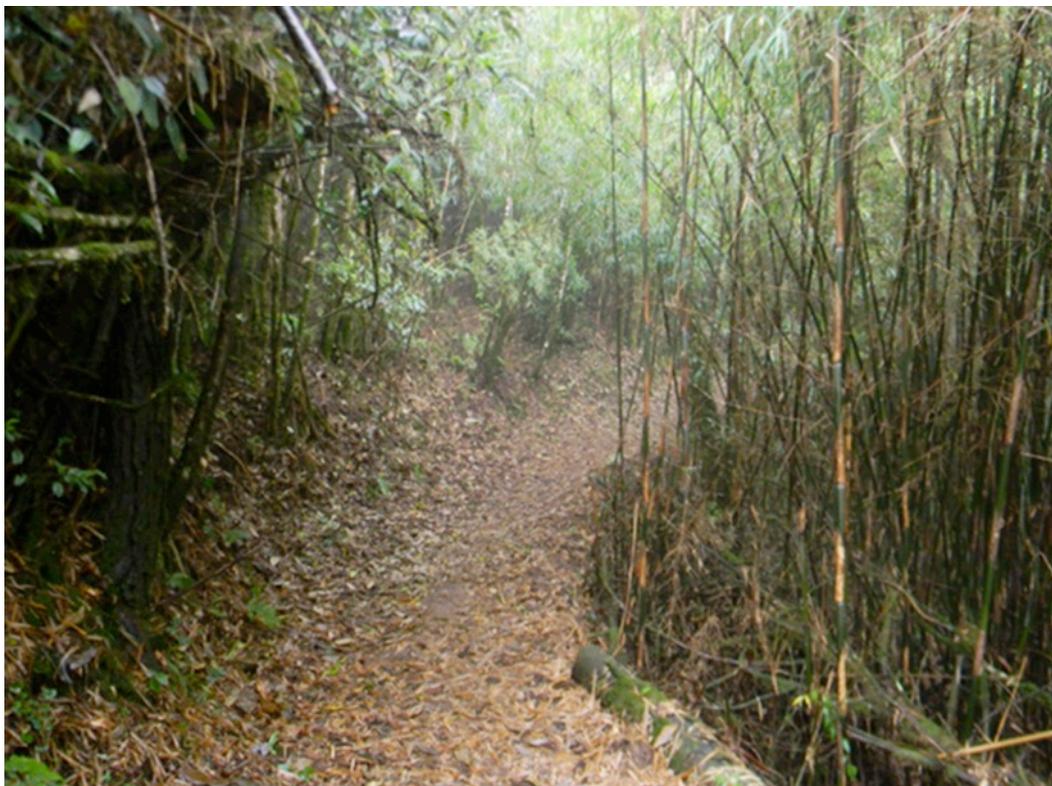
### Observations

**Location and Habitat:** During our expedition to Neora Valley National Park of Kalimpong District (West Bengal, India) in 2015, we encountered a single individual of *Lethe tristigmata* near Choudapheri camp (27°5'34.51"N, 88°42'6.15"E) at an elevation of 2377 m (Figure 2). Choudapheri has an approximate aerial distance of 68 km. from Kalipokhri and 61 km. from Tonglu (Figure 2).

Neora Valley National Park, one of the oldest national parks of India, is an undisturbed, pristine hilly forest nestled in the northern part of West Bengal. The landscape has a unique topology comprising a mosaic of multiple landforms and an altitudinal range varying from 180 m to 3170 m (Anonymous, 2019). The habitat in and around Choudapheri camp is primarily composed of oak forest, East Himalayan subalpine conifer, rhododendron forest and Himalayan moist temperate forest dominated with montane bamboo thickets, mostly Maling Bamboo (Poaceae: *Yushania maling* (Gamble) R.B.Majumdar & Karthik.) (Anonymous, 2019) (Figure 3, Figure 4). The climatic condition here is moist temperate.



**Figure 2:** Distribution locality map of *Lethe tristigmata* in India showing previously reported locations: Tonglu/Tonglu (West Bengal) (green pointer) and Kalapookri/Kalipokhri (West Bengal) (orange pointer); as well as the location of our recent sighting: Choudapheri (West Bengal) (red pointer). This map also denotes aerial distance of Choudapheri from Tonglu and Kalipokhri (Inset: Map of India and West Bengal) and was prepared using Google Earth Pro.



**Figure 3:** Habitat (composed of dense Maling bamboo thicket) of the particular location in Choudapheri, Neora Valley National Park where the *Lethe tristigmata* individual was encountered.



**Figure 4:** General habitat of Choudapheri, Neora valley National Park; photograph taken during the butterfly survey.

**Sighting record:** An annual butterfly survey is conducted in Neora Valley National Park (NVNP) since 2014. The survey is conducted in May-June as it is the peak season for butterfly activity in NVNP. In 2015, the butterfly survey started on 26<sup>th</sup> May and ended on 9<sup>th</sup> June and on 31<sup>st</sup> May 2015, we spotted a *Lethe tristigmata* roaming around a dense thicket of Maling bamboo in Choudapheri (Figure 4). The movement of the butterfly was irregular and non-directional. After flying for a while, it suddenly settled on a leaf of Maling bamboo in an open area where there was ample sunlight. We managed to take a few photographs of that individual for documentation (Figure 5a-b) before it flew off again and disappeared.

We confirmed the species identification using taxonomic keys (Elwes 1887; De Nicéville 1889; Moore 1890-1892; Evans 1932). We also checked for the sex of this individual following taxonomic features of the ventral side of the wings (mostly bands and spots) and confirmed it as a male. After that encounter, which took place around 14:20 hours, we thoroughly searched for the individual in that area for some time but did not find it any more. At the time of the sighting the weather was partly sunny, with temperature and relative humidity 23°C and 79% respectively. This sighting record was then submitted to the online portal of 'ifoundbutterflies.org' which further confirmed the identification of the species as *Lethe tristigmata* and published it with media code *ca487* (Figure 6) (Anonymous 2023).

### Discussion

We believe that this report of rediscovery is very significant as it indicates a local existence of *Lethe tristigmata* in Neora Valley National Park, India. Thus, in order to have an idea of the current population trend and dynamics as well as distribution of the species, a thorough year-long survey is required in Neora Valley National Park and adjacent areas. Additionally, studies on butterfly-plant interaction and niche utilization will help in identifying its potential

habitat patches. We think this article will encourage scientists, conservationists and State Forest Department to execute the suggested studies and take necessary conservation actions for this extremely rare data deficient species.

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**Figure 5(a-b):** Photographic documentation of the encountered *Lethe tristigmata* individual perching on Maling Bamboo leaf in Choudapheri.



**Figure 6:** The image of *Lethe tristigmata* submitted to online portal of Ifoundbutterflies with media code ca487.

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