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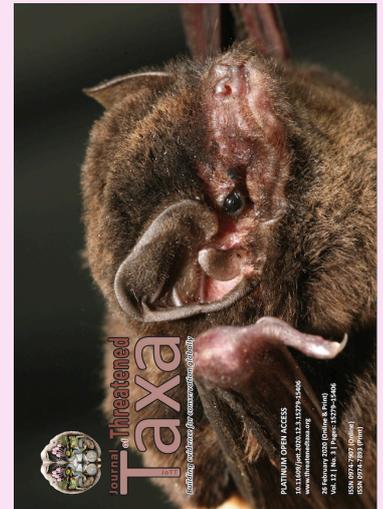
NOTE

OCCURRENCE AND ASSOCIATION OF THE SCARCE LILACFORK *LETHE DURA GAMMIEI* (MOORE, [1892]) (LEPIDOPTERA: NYMPHALIDAE: SATYRINAE) WITH WOOLLY-LEAVED OAK *QUERCUS LANATA* SMITH, 1819 (FABACEAE) FOREST IN THE KUMAON REGION OF THE INDIAN HIMALAYA

Arun P. Singh & Tribhuwan Singh

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Occurrence and association of the Scarce Lilacfork *Lethe dura gammiei* (Moore, [1892]) (Lepidoptera: Nymphalidae: Satyrinae) with Woolly-leaved Oak *Quercus lanata* Smith, 1819 (Fabaceae) forest in the Kumaon region of the Indian Himalaya

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The Scarce Lilacfork *Lethe dura* (Marshall, 1882) occurs as five subspecies. The subspecies *L.d. gammiei* (Moore, [1892]) has a distribution extending from Sikkim to Arunachal Pradesh including Bhutan and northeastern India with males being “not rare” while females being “very rare”; the nominate subspecies *L.d. dura* (Marshall, 1882) occurs in northwestern Yunnan, China (Huang 2003), Myanmar from Shan states up to Dawnas and is “very rare”; while the third subspecies *L.d. mansonia* (Fruhstorfer, 1911) occurs in Myanmar but only in Dawnas as “very rare” (van Gasse 2017) and in northern Vietnam; the fourth subspecies *moupinensis* (Poujade, 1884) is known from western China; and the fifth subspecies *neoclydes* Fruhstorfer, 1909 occurs in Taiwan (<http://ftp.funet.fi/pub/sci/bio/life/insecta/lepidoptera/ditrysia/papilionoidea/nymphalidae/satyrinae/lethe/>). Besides, there are records during May from Karen Hills and Tenasserim region of Myanmar (Marshall & de Nicéville 1882; Talbot 1947). In the Himalaya, the subspecies *L.d. gammiei* is found in Sikkim (Teesta Valley at ~1,500m and from Gangtok to Dikchu),

Bhutan (Trashiyantse; 1,500–3,000 m), Arunachal Pradesh, hilly forests of northeastern India (Khasi Hills), from 1,800–2,200 m with a flight period from April to November (Evans 1932; Wynter-Blyth 1957; Sbordoni et al. 2015; Kehimkar 2016; van Gasse 2017) (Fig. 1). A specimen of *L.d. gammiei* from Sikkim (1 male) was collected by O.C. Ollenbach on 04.vii.1920 which is kept at the National Forest Insect Collection (NFIC), Forest Research Institute, Dehradun (Fig. 2 a&b). There are records of *L.d. gammiei* from Kalimpong in West Bengal, western Sikkim, and Cherrapunjee in Meghalaya (<https://www.ifoundbutterflies.org/>). The larval food plant of the species is not yet known. D’Abrera (1985) (Figs. 3a,b), however, reports its occurrence from northwestern India, Sikkim, and Bhutan, but there are no site specific records of *L.d. gammiei* from either Garhwal or Kumaon regions of Uttarakhand in western Himalaya (Mackinnon & de Nicéville 1899; Hannynghton 1910; Singh & Sondhi 2016; Sondhi & Kunte 2018) or in Nepal where its congener, the Lilacfork *L. sura* Doubleday, 1850 is known to occur (Smith 1989, 2006). The species is currently

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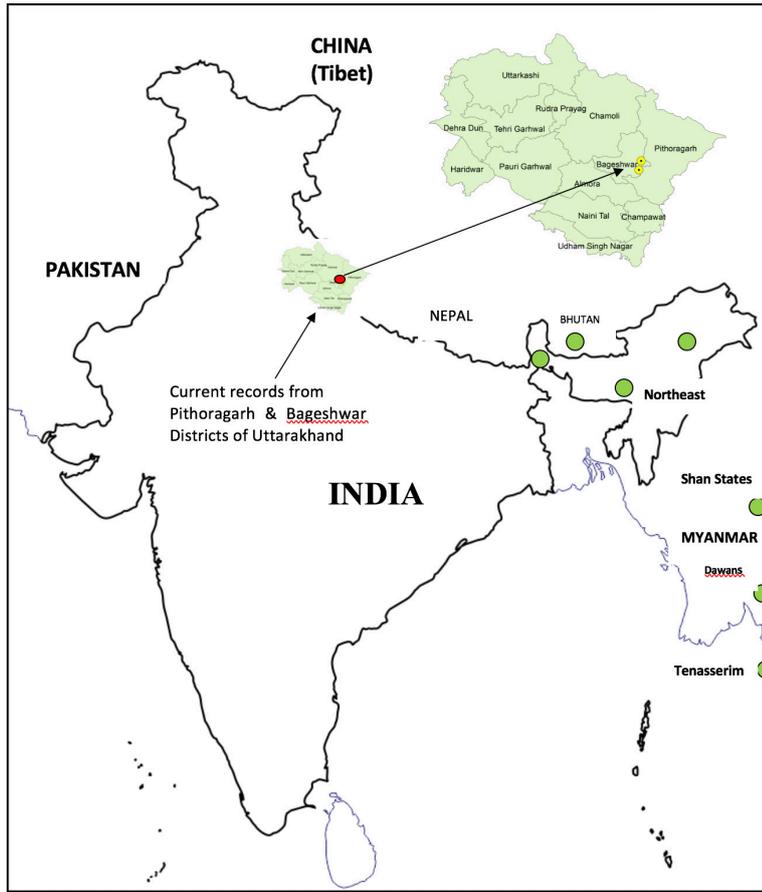


Figure 1. The location of present records of the Scarce Lilacfork *Lethe dura gammiei* (Moore, [1892]) from Uttarakhand (Kumaon Himalaya) in relation to past records of the species in other areas across the Himalaya, in northeastern Indian hills, and in Myanmar.



Image 1. *Lethe dura gammiei* (Moore, [1892]) (male) from Sikkim (04.vii.1920) at NFIC at Forest Research Institute, Dehradun, Uttarakhand, India. Photo credit: Arun P. Singh.

protected and is listed in Schedule I, Part IV, of the Indian Wildlife Protection Act, 1972 (Anonymous 2006).

During the course of surveys in Uttarakhand, two

males of *L.d. gammiei* were observed at Dharamghar forest area (Figs. 4a,b, 5; 29.868°N & 80.007°E; 1,989m; sub-type 12/C1a Ban Oak *Quercus leucotrichophora*

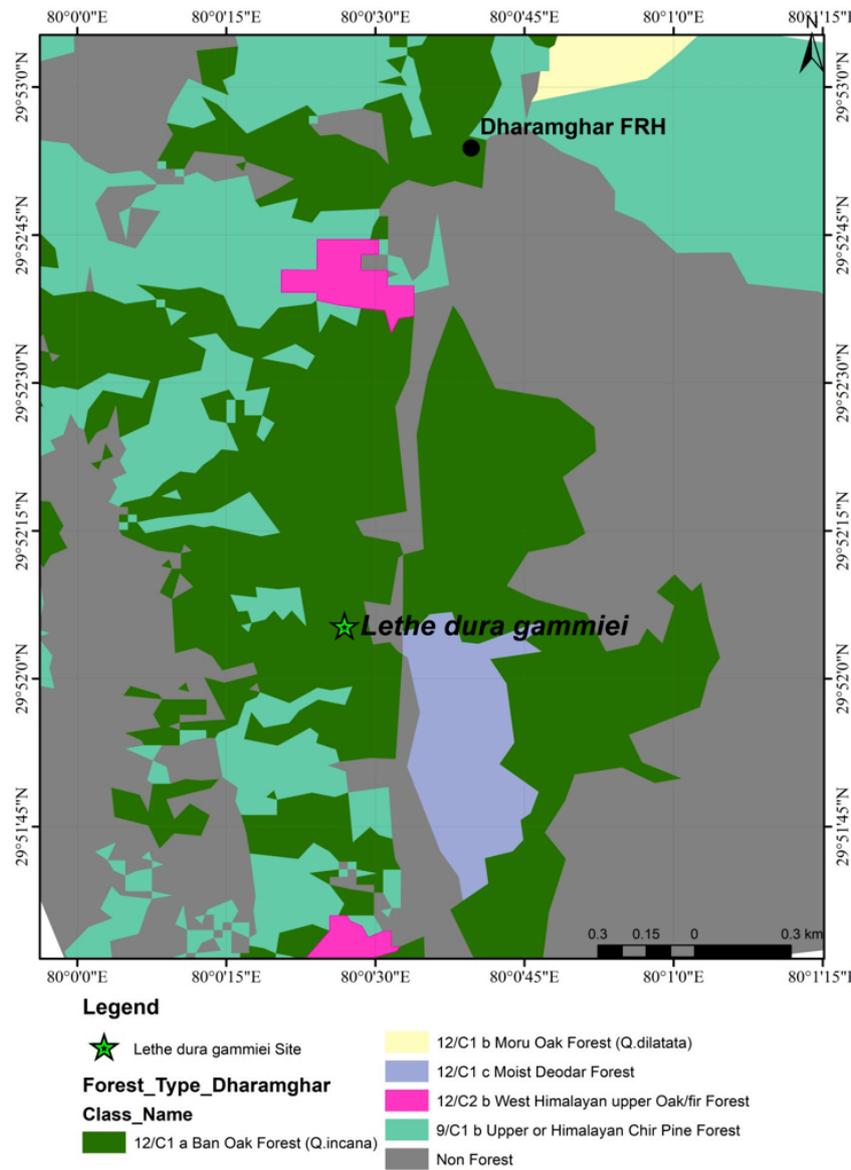


Figure 2. Location of the occurrence of the Scarce Lilacfork *Lethe dura gammiei* (Moore, [1892]) (Satyrinae) in Woolly-leaved Oak *Quercus lanata* Smith (Fabaceae) forest under sub-type 12/C1a Ban Oak Forest, in Dharamghar in the Kumaon region of Uttarakhand.

Forest; 22°C; 76% RH at 09.25h on 16.ix.2019) in Pithoragarh District of Kumaon in Uttarakhand. The forest is dominated by Woolly-leaved Oak *Quercus lanata* Smith, 1819 (Riyanj) in pure patches (tree density ~1500 trees/ha; GBH varying from 30–131 cm; mean GBH of oak trees 67cm) and also with other associates like *Q. leucotrichophora*, *Rhododendron arboreum*, *Myrica esculenta*, and *Aesculus indica*. Three more individuals of *L.d. gammiei* were recorded near Shama Village (29.971°N & 80.046°E; 2,039m; sub-type:12/C1a Ban Oak Forest (Fig. 5); 26°C; 68% RH at 13.30h on 18.ix.2019) in Bageshwar District, Uttarakhand. The forest being dense and dominated by *Quercus lanata* intermixed with other associates like *Q. leucotrichophora*,

Alnus nepalensis, *Rhododendron arboreum*, *Viburnum* sp., *Strobilanthus* sp., and *Colquhounia* sp.

Our observations suggest that in northeastern Kumaon, this species seems to be associated with *Quercus lanata* Smith (syn. *Q. lanuginosa* D.Don) which has overlapping distribution extending from Kumaon in Uttarakhand eastwards to Arunachal Pradesh, through Nepal, Sikkim, Bhutan, and extends into Myanmar; it grows gregariously in patches often associated with Ban Oak *Q. leucotrichophora* between 1,400–2,400 m in western Himalaya. *Q. lanata* has glabrous leaves when mature (Brandis 1911; Osmaston 1927; Polunin & Stainton 1989). The distribution of *Q. lanata* in the Kumaon region falls under the forest type 12/C1, lower



Image 2. *Lethe dura gammiei* (Moore, [1892]) (male) from Himalaya (photographs of the concerned species depicted on the species page in the book by D'Abbrera (1985).



Image 3. *Lethe dura gammiei* (Moore, [1892]) (male) at Dharamgarh Forest (16.ix.2019; 1,989m), Pithoragarh District, Uttarakhand, India

western Himalayan temperate forests as per Champion & Seth's (1968) classification.

The current findings are the first site specific records of *L.d. gammiei* from the Kumaon region of the Himalaya and its unique association with Woolly-leaved Oak *Q. lanata*. These are also the first published records of the species from northwestern Himalaya confirming its occurrence in Uttarakhand.

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