

Six new additions to the Indian butterfly (Lepidoptera) fauna from Upper Siang, Arunachal Pradesh, India

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ABSTRACT: This paper reports six new additions to the butterfly fauna of India, based on photographic evidence from the community forests of Simong Village in Upper Siang district of Arunachal Pradesh, India. The six species — *Horaga takanamii* Seki and Saito, 2004, *Dacalana vui* Saito and Inayoshi, 2022, *Euthalia zhaxidunzhui* Huang, 1998, *Athyma yui* Huang, 1998, *Stichophthalma neumogeni renqingduojiei* Huang, 1998 and *Stiboges elodinia* Fruhstorfer, 1914 — have not been previously reported from India. *Horaga takanamii* was previously known from Laos, while *D. vui* was known to be distributed in Northern Thailand (Nan Province) and Northern Vietnam and *S. elodinia* from Northern Thailand to China. *Euthalia zhaxidunzhui*, *A. yui* and *Stichophthalma neumogeni renqingduojiei* were earlier reported from Northern Myanmar and Metok county of the adjoining Tibet. These new reports highlight the importance of Siang valley as an important region of lepidopteran diversity in India.

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KEY WORDS: Community forest, distribution records, Eastern Himalayas, Metok county

INTRODUCTION

The Siang Valley, nestled in the Eastern Himalayas of India, is named after the Siang River which is known as *Yarlung Tsangpo* (or *Yarlung Zangbo*) in Tibet, where it flows for 1200kms. The river, also known as Brahmaputra in Assam, has been critical in shaping the ecological and cultural landscape of the region, which is bounded by the Mishmi Hills of Dibang Valley on its east and the Miri Hills of Ziro or Apatani Valley in the west. The northern part of the valley is bounded by the southeastern region of Tibet.

The predominantly mountainous valley spans a high elevational gradient ranging from 150m in the foothills to 5000 m, and is therefore extremely rich in biodiversity. The natural habitat ranges from alluvial wet grassland in the foothill plains to tropical evergreen forests between 150 – 1200m in the low elevation belt, sub-tropical and temperate broadleaf in mid-elevation belt (1200 – 2500m) and mixed conifer forests and alpine meadows at higher elevations between 2500 – 3500m and beyond.

Siang Valley experiences a tropical to alpine climate, with heavy monsoon rains between June and September, accounting for 75 per cent of the total

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annual rainfall, along with pre and post monsoon rains from February to May and in October. This results in an annual rainfall of 2500 – 3000 mm, which significantly influences vegetation and faunal distributions. Upper Siang supports a rich assemblage of flora and fauna, with high endemism due to its varied topography and altitudinal gradients (Singh and Singh, 2012; Datta–Roy *et al.*, 2018; Taram *et al.*, 2020; Sharma *et al.*, 2024). The forests here serve as critical habitat for several rare and range-restricted species, including high-altitude butterflies, highlighting the importance of biodiversity monitoring in the region.

Butterflies from Siang remain poorly studied (Evans, 1912; Sarkar, 2018). Several previous studies on butterflies and other flora and fauna from the adjacent Dibang valley have reported species similarities with Metok (variably called Medog or Motuo) region of Southeastern Tibet (Evans, 1915; Gogoi and Payra, 2019; Huang, 1998; Boruah *et al.*, 2022; Dodum, 2021). However, the presence of Metok species in Siang has not been confirmed so far despite both the regions being connected by the same river. This can be probably because the studies were opportunistic and lacked seasonal replicates in their survey design, leading to severe under-reporting of butterfly species from this region.

The first major butterfly survey in the Siang Valley was conducted during the infamous Abor military expedition, when H.W. Price and E.H. Sweet collected specimens from the valley and adjacent plains of Assam. Their records noted only 74 species, likely due to heavy rainfall during the collection period (Evans, 1912, 1932). More than a century later, in 2018, a team from the Wildlife Institute of India retraced the route of the British expedition and recorded 269 butterfly species during a 22-day survey; however, no formal species list was published (Sarkar, 2018). Since then, no systematic studies on the butterflies of Siang have appeared in peer-reviewed literature, leaving much of the valley's butterfly diversity—and its broader faunal composition—still poorly documented and understood.

MATERIALS AND METHODS

The butterfly records presented in this paper were collected during a camera trapping expedition aimed at documenting the biodiversity of Litin Community Conserved Area (henceforth, Litin CCA), situated within the Simong Community Forest (henceforth, Simong Forest), in Upper Siang district, Arunachal Pradesh, India. The local communities here, including the Adi and other indigenous groups, play a crucial role in conservation through traditional land stewardship practices. Located near Simong Village and the town of Yingkiong, Litin CCA spans an elevation of 1800 – 3800m, encompassing subtropical, temperate and alpine ecosystems. The area forms a key part of ATREE's long-term biodiversity monitoring and community-led conservation initiatives in the Siang Valley, contributing to the documentation and protection of the region's unique biota (ATREE's Siang Valley Biodiversity Conservation Programme). Opportunistic butterfly sampling was carried out alongside camera-trapping activities in Simong Forest (Fig. 7). The first survey was conducted on June 8–9, 2024, around Simong village, at elevations ranging from 1300 – 1500m, and included an additional survey at the same site on July 19, 2024. The second survey, from July 31 to August 3, 2024, focused on the higher elevation regions of the Simong Forest. This survey aimed to support the Litin clan in installing camera traps along the higher ridges of the Abor Hills, particularly in areas adjoining Mount Eko–Dumbin, which forms part of the Litin CCA. The total trail distances covered on foot during the first and second surveys were approximately 6 and 12km respectively. During the surveys, butterflies were photographed in their natural habitat. In some cases, individuals were gently handled to capture images of both the dorsal and ventral wing surfaces, after which they were released. Species identification and confirmation were carried out using standard references, including Huang (1998), Yago (2004), Saito and Inayoshi (2022), and Huang *et al.* (2024).

RESULTS AND DISCUSSION

During the survey, 90 butterfly species were recorded over a span of seven days. Among these,

the most notable observation was of *Horaga takanamii* Seki and Saito, 2004, previously known only from Laos - representing a new record for India. Additionally, a single individual each of *Dacalana vui* Saito & Inayoshi, 2022 and *Stiboges elodinia* Fruhstorfer, 1914, were also documented. The present study, which recorded three butterfly species previously known only from Metok County in southeastern Tibet, highlighting, the distribution of shared species and the habitat continuity with the Siang Valley. These finding reinforce the view that Metok falls within the Sino-Himalayan subregion of the Oriental (Indo-Malayalam) region, a transitional zone linking the Indian sub region to the west and south with the Chinese subregion to the east and north. Nearly all butterfly species recorded from Metok exhibit subspecific affinity with those from the Eastern Himalayas (Huang, 1998). A striking example is the Tibetan Jungle Queen, *Stichophthalma neumogeni renqingduojiei* Huang, a subspecies previously reported only from Metok. Other notable sightings, beyond the new records for India, included the

Bhutan Treebrown (*Lethe margaritae* Elwes, 1882), White-edged Woodbrown (*Lethe visrava* (Moore, [1866])), Columbine (*Stiboges nymphidia* Butler, 1876), Hockeystick Sailer (*Neptis nycteus* de Nicéville, 1890), and three species of Labyrinth – Yellow Labyrinth (*Neope armandii* (Oberthür, 1876)), Tailed Labyrinth (*Neope bhadra* (Moore, [1858])) and Veined Labyrinth (*Neope pulaha* (Moore, [1858])).

The taxonomic information, natural history, habitat preferences, behavioural traits, and ecological observations of newly recorded six butterfly species are provided with additional insights.

1. *Horaga takanamii* Seki and Saito, 2004 (Lycaenidae, Theclinae) (Figs. 1a, 1b) (suggested English common name: Litin Onyx)

Very little information is currently available on *Horaga takanamii* Seki and Saito. Previously known only from Laos, this species is allopatric to the Formosan Onyx, *Horaga rarasana* Sonan, 1936, which is endemic to Taiwan. Another species



Fig. 1a



Fig. 1b



Fig. 2a



Fig. 2b

Fig. 1a - Litin Onyx, *Horaga takanamii* Seki and Saito, 2004 – Underside wing; 1b - Litin Onyx – Female laying eggs on the host plant, *Symplocos* sp.

Fig. 2a - Tibetan Duke, *Euthalia zhaxidunzhui* Huang, 1998 – Upper side wing; 2b – Underside wing

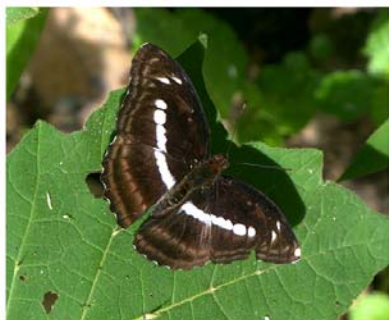


Fig. 3a



Fig. 3b



Fig. 4



Fig. 5

Fig. 3a - Tibetan Sergeant, *Athyma yui* Huang, 1998 – Upper side wing; 3b - Underside wing

Fig. 4 Tibetan Junglequeen, *Stichophthalma neumogeni renqingduojiei* Huang, 1998

Fig. 5 Narrow banded Royal, *Dacalana vui* Saito and Inayoshi, 2022

described from Laos, *H. uedai* Yago, 2004, was later synonymized with *H. takanamii* by Inayoshi (1996-2025) (<https://yutaka.it-n.jp/lyc4g/83185001.html>). *H. takanamii* is known from inland areas of the Asian subcontinent (Yago, 2004) and remains geographically isolated from *H. rarasana*, which is restricted to the high mountains of Taiwan.

The larval host plant of *H. takanamii* remains unknown in Laos but is speculated to be *Symplocos sumuntia* (Symplocaceae), similar to *H. rarasana* (Hsu and Yang, 1999), as one individual was observed ovipositing on a *Symplocos* species.

The identification of *H. takanamii* was based on key morphological traits described by Saito and Seki (2003):

- The postdiscal band on the underside is oblique in *H. takanamii*, whereas it is straight in *H. rarasana*.

- *H. takanamii* has a prominent marginal cell bar on the hindwing, which is absent in *H. rarasana*.
- The marginal band in *H. takanamii* is chocolate brown with metallic green scaling below vein 5, whereas in *H. rarasana*, metallic scaling extends up to vein 7.

This species is a new addition to the Indian butterfly fauna, based on the documentation of three individuals observed on 8–9 June 2024 in the Simong Forest. This finding extends the known range of the species by over 1,200km from Xam Neua, Laos, across the Myanmar-Yunnan Mountain ranges to the Eastern Himalayas. Common name Litin Onyx for *H. takanamii*, is proposed in honor of the *Litin* clan of the *Adi* community, who continue to protect their biodiversity-rich forests. Further molecular studies are warranted on this newly documented population from the Siang Valley to better understand its

evolutionary origin, dispersal, and biogeographic history.

2. Tibetan Duke, *Euthalia zhaxidunzhui* Huang, 1998 (Nymphalidae, Limenitidinae) (Figs. 2a, 2b)

Until the recent discovery, this butterfly species was previously known only from Metok, and Kachin State in North Myanmar (Huang *et al.*, 2024). The Northern Myanmar population was previously misidentified by as *Euthalia haradai* Yokochi, 1996 by Yokochi (2012). *Euthalia zhaxidunzhui* was considered a subspecies of *Euthalia strephon* species complex, and raised to species rank by Yokochi (2012).

The presence of this species in India is confirmed through photographic evidence recorded on 31, July 2024, from Simong Forest. Its potential distribution extends from Metok, Tibet, through eastern Arunachal Pradesh, to Kachin State, Myanmar, as illustrated in Huang *et al.* (2024).

3. Tibetan Sergeant, *Athyma yui* Huang, 1998 (Nymphalidae, Limenitidinae) (Figs. 3a, 3b)

Originally considered a subspecies of *Athyma selenophora*, this taxon was elevated to full species status by Koiwaya (2016). Its known distribution includes southeastern Tibet, northern Myanmar, Thailand, Laos, and Vietnam. The specimen recorded from the Siang Valley closely resembles individuals from Metok, particularly in exhibiting a narrower white band (Huang, 1998). In contrast,

specimens from Thailand show a broader band, and further validation is required to confirm its identity in that region.

This species represents a new record for India, confirmed through photographic documentation of an individual observed on 31 July 2024 in Simong Forest.

Tibetan Junglequeen, *Stichophthalma neumogeni renqingduojiei* Huang, 1998 (Nymphalidae, Morphinae) (Fig. 4)

Described from Metok (Huang, 1998), this subspecies is distinct from two related subspecies – one found in Sichuan, Shaanxi, Fujian, Jiangxi and another on Hainan Island, China. This butterfly is similar to *Stichophthalma nourmahal* (Westwood, 1851) (Chocolate Junglequeen) of the Eastern Himalayas but differs in having an extended blacktip on the upper forewing, a brighter chocolate colouration, and more distinct submarginal lines (Lang, 2010). This subspecies is new to India, confirmed by photographic evidence on July 31, 2024, and subsequent sightings from Simong Forest.

Narrow banded Royal, *Dacalana vui* Saito & Inayoshi, 2022 (Lycaenidae, Theclinae) (Fig. 5)

This recently described species is known from northern Thailand (Nan Province) and northern Vietnam. It was initially misidentified as *Dacalana inorthodoxa* Seki and Saito, 2006, and is considered rare, occurring in montane forests at moderate elevations. The species is readily

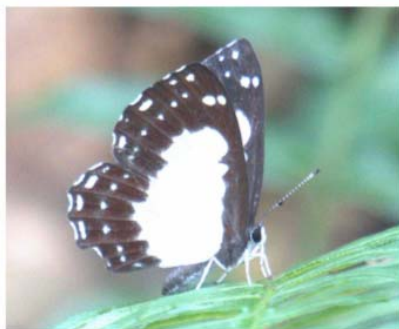


Fig. 6a



Fig. 6b

Fig. 6a - Mountain Columbine, *Stiboges elodinia* Fruhstorfer, 1914 – Underside wing; 6b - Upperside wing

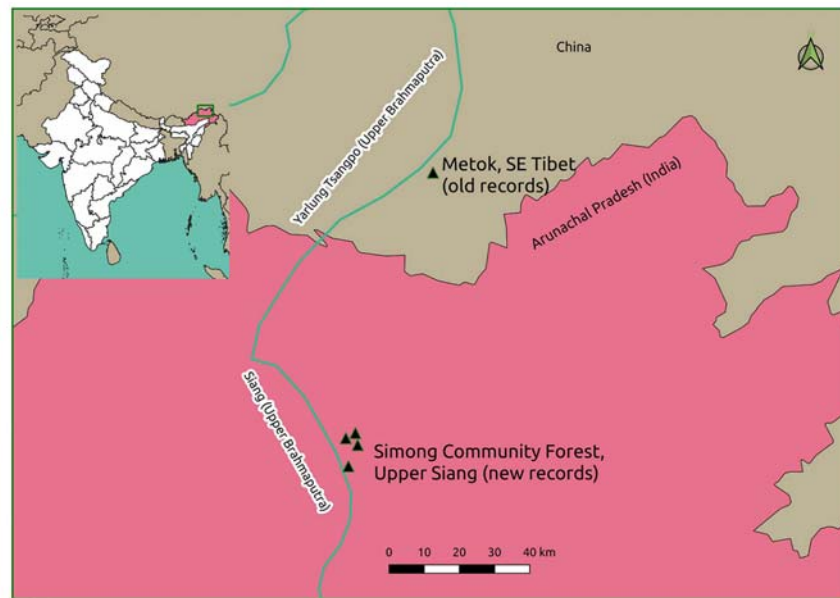


Fig. 7 Survey area in Simong, Arunachal Pradesh, and Metok County in Southeastern Tibet, where the butterflies were previously recorded.

distinguishable from all other known Indian *Dacalana* species by the presence of a narrow white band running across both wings.

This constitutes a new record for India, confirmed by photographic documentation of a single individual observed on 19 July 2024 in the Simong Forest, Upper Siang, Arunachal Pradesh. The sighting represents a significant range extension of the species from northern Thailand and northern Vietnam into the Eastern Himalayas.

Mountain Columbine, *Stiboges elodinia* Fruhstorfer, 1914 (Riodinidae, Nemeobiinae) (Figs. 6a, b)

A female individual of *Stiboges elodinia* was recorded on 31st July 2024, in Simong forest at an elevation of 2,200m. Prior to this observation, the species was known from northern Thailand, Laos, Vietnam, China, where it has been documented between elevations of 1,000 and 1,700m (<https://yutaka.it-n.jp/rio/8a330001.html>). It can be distinguished from *Stiboges nymphidia* by its more prominent circular white spots on the upper side of hindwings, a trait consistent across both sexes, along with a smoother wing border (Callaghan, 2009).

The present findings strongly suggest that additional butterfly species known from Metok County, southeastern Tibet, are likely to occur in the Siang Valley. The Brahmaputra River — which connects both Metok region of Tibet and the Siang Valley of Arunachal Pradesh — appears to play a critical biogeographic role, facilitating faunal continuity between southeastern Tibet and eastern Arunachal Pradesh.

The documentation of six previously unrecorded species within a short one-month survey underscores the striking lack of Lepidopteran surveys and conservation attention in the Indian Eastern Himalayas. Notably, *Stichophthalma neumogeni renqingduojiei*, previously thought to be localized in Metok, was found to be relatively common in Simong Forest, with an average of 20 individuals encountered daily — highlighting the absence of prior systematic surveys in the region. It is also plausible that *Horaga takanamii* could also occur in Northern Myanmar at elevations of 1400 – 1600m, like its range in Siang Valley. The same is likely true for *Dacalana vui*, which may inhabit adjacent areas of northern Myanmar.

In the same vein, *Calinaga aborica* Tytler, 1915

— commonly known as the Abor (or Dark) Freak and originally described from the Abor Hills — has often been considered a rare endemic species. However, our observations suggest otherwise. During surveys conducted in April–May, the species was recorded in large numbers across multiple locations including Damro, Yingku, and Kaying, with over 300 – 500 individuals observed per site, indicating its abundance in the region.

Despite its rich and unique biodiversity, the Siang Valley remains one of the least explored regions of the Eastern Himalayas. It is increasingly threatened by localised pressures such as timber extraction, hunting, and the expansion of cash crop plantations. Looming large-scale threats include the proposed Siang Dam project, which, paradoxically, would submerge Simong village — one of the oldest and most biodiverse settlements in the Siang Valley. Safeguarding the Siang Valley will require strengthening community conservation efforts alongside rigorous scientific documentation, before irreplaceable biodiversity is lost.

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