



## Refining Nepal's butterfly records: self-corrections and notes on previously recorded Papilionoidea (Lepidoptera) species

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**ABSTRACT.** Accurate documentation and identification of species, along with publishing findings in peer-reviewed sources, are essential for enhancing biodiversity knowledge and guiding conservation efforts effectively. In this paper, we present corrections to records of butterfly species we previously documented from Nepal, updating their identifications based on new information. The records of three misidentified species are corrected: *Caltoris sirius sirius* (Evans, 1926), *Catochrysops panormus exiguus* (Distant, 1886), and *Pelopidas conjuncta narooa* Moore, 1878. Additionally, we have revalidated the records for four species: *Caltoris bromus bromus* (Leech, 1894), *Celaenorhinius nigricans nigricans* (de Nicéville, 1885), *Nacaduba berenice plumbeomicans* (Wood-Mason & de Nicéville, 1881), *Pantoporia sandaka davidsoni* Eliot, 1969, and one form, *Danaus chrysippus chrysippus* (Linnaeus, 1758) f. *alcippoides* (Moore, 1883), which were previously reported in journals listed on Beall's list of potential predatory journals, to ensure their authenticity. Our goal is to provide a reliable, corrected, and authoritative reference source for these records, enhancing the accuracy of butterfly species documentation in Nepal.

**Keywords:** biodiversity, conservation, correction, Himalaya, taxonomy

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### INTRODUCTION

Butterflies are valuable indicator species for monitoring environmental changes owing to their sensitivity to habitat alterations and relative ease of observation and identification (Brown Jr, 1991; Parmesan, 1996; Parmesan et al., 1999; Thomas et al., 2004). Their presence or absence, when compared to historical data, can reveal trends in environmental conditions (Kunte, 1997; Guedes et al., 2000; Pateman et al., 2012), providing valuable insights to guide conservation efforts. Given their ecological significance, it is crucial to document them accurately and publish findings in peer-reviewed sources to ensure quality and credibility (Ali & Watson, 2016). In Nepal, butterflies serve as critical indicator species for evaluating the effects of climate change in the Central Himalayas (Dahal et al., 2021). Smith (2010) documented 661 butterfly species in Nepal, including their distribution ranges. Since then, over two dozen new species have been added by various researchers, including ourselves, as summarized by Van der Poel and KC (2022), and Van der Poel and Smetacek (2022), bringing the species (excluding non-nominotypical subspecies) count to 692; additional records of *Coladenia pinsbukana* (Shimonoya &

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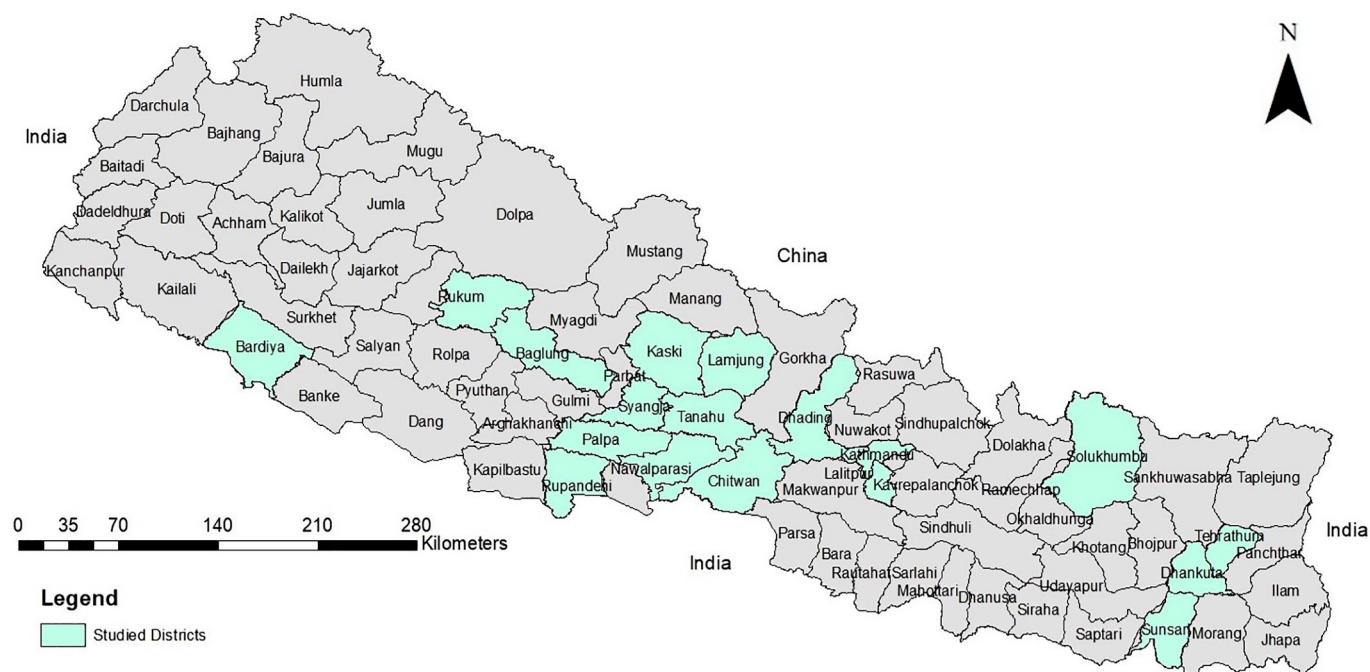
Murayama, 1976), *Celaenorrhinus pulomaya* (Moore, [1866]), and *Delias lativitta* Leech, 1893 from Nepal increased this number to 695 (Katayama, 2017; Van der Poel, 2023, 2024).

Between 2019 and 2021, we documented over 200 new butterfly records in Nepal, representing expansions in distribution, elevation, and phenological ranges, as summarized in KC and Sapkota (2022), among others. Although our new records underwent peer reviews, five of them were published in journals listed on Beall's list (<https://beallslist.net>), of which we were unaware and which could potentially raise concerns about their validity. While acknowledging the criticisms surrounding Beall's list (Mills & Inouye, 2021; da Silva, 2022), we have chosen to revalidate those five records to ensure their authenticity and preclude potential future doubts. Furthermore, upon reexamination, we realized that despite peer reviews, three other species' records were misidentified. Restrictions on specimen collection in Nepal, imposed by permit requirements, often led us to rely on photographic evidence, which can be challenging for accurate identification. Although references such as Evans (1927, 1932, 1949) are generally reliable, some keys, particularly for cryptic taxa, might not account for conspecific variations. In this paper, after reevaluating our previous identifications, we withdraw three of them to prevent the perpetuation of errors; we also revisit and reaffirm five records to address concerns about the authenticity of the journals in which they were originally reported.

## MATERIAL AND METHODS

Butterflies were recorded during opportunistic surveys in Nepal between 2019 and 2021, covering 19 districts (Fig. 1) ranging between 70 m and 2700 m elevation. Specimens were photographed using a Sony® Cyber-Shot DSC-HX90V camera (Sony® Corp., Tokyo), a Canon® 7D Mark II camera equipped with a Canon EF 100 mm f/2.8 L Macro IS USM lens, and a Nikon® Coolpix B500 camera. The GPS details and other metadata were automatically recorded by the Sony and Canon cameras. Whenever permits were available, specimens were captured using aerial nets; collected specimens were deposited in ANHM. Genitalia analyses were performed in the laboratory of NERC, using an Olympus® stereomicroscope (Model SZ2-ILST) after treating with 10% potassium hydroxide (KOH) solution to macerate the soft tissues and facilitate detailed examination. Photographs of the genitalia were captured using an iPhone 6s smartphone. The genitalia analysis of a *Celaenorrhinus sirius fusca* (Evans, 1932) specimen from MGCL, dissected for this study, was performed using a Leica Ivesta 3 stereomicroscope following an overnight soak of the abdomen in 10% KOH solution. Genitalia images of the specimen were captured at FSCA using a Macropod imaging system equipped with a Canon EOS 6D Mark II camera and a Canon MP-E 65 mm macro lens. The imaging process involved Canon EOS Utility 3.14.30.4 and Helicon Focus® Pro 7.7.5 for focus stacking. Post-processing was completed using Mac Preview (version 11.0) and GIMP 2.10.

Between 2021 and 2024, we examined specimens of selected butterfly species in ANHM and MGCL to verify identifications and study the phenotypic variations. In addition to the literature review, including Corbet and Pendlebury (1956), Eliot (1969), Ek-Amnuay (2012), Kehimkar (2016), and Smetacek (2017), online platforms such as iNaturalist (2024), Inayoshi (2024), and Kunte et al. (2024) were reviewed to study conspecific variations and gain insights into the natural histories of the species. Furthermore, we ensured the credibility of previously published records by cross-checking the journals in which they appeared against Beall's list of potential predatory journals (<https://beallslist.net>), thereby maintaining the integrity of our records. Considering the criticisms surrounding the list (Mills & Inouye, 2021; da Silva, 2022), we utilized it as a relative reference rather than an absolute authority. We used FUNET (2024) to find the type localities and protonyms of the species. The wing venation is described according to Evans (1949). Map of the study area (Fig. 1) was generated using ArcMap 10.4 software. The following abbreviations are used for the names of institutions mentioned in this paper: **AFU** – Agriculture and Forestry University, Rampur, Chitwan District, Nepal; **ANHM** – Annapurna Natural History Museum, Pokhara, Kaski District, Nepal; **FSCA** – Florida State Collection of Arthropods, Gainesville, Florida, USA; **MGCL** – McGuire Center for Lepidoptera and Biodiversity, Gainesville, Florida, USA; **NERC** – National Entomology Research Center, Khumaltar, Lalitpur District, Nepal.



**Figure 1.** Study area map of Nepal, highlighting the study districts.

## RESULTS

The following taxa/form(s) were previously reported from Nepal by us between 2019 and 2022 in journals that have been identified as potentially predatory, also listed on Beall's list of questionable journals (<https://beallist.net>). These records and evidence were new when initially presented in such journals, and we revalidate them herein. The species are listed in alphabetical order.

### *Taxonomic hierarchy*

**Class Insecta Linnaeus, 1785**

**Order Lepidoptera Linnaeus, 1758**

**Family Hesperidae Latreille, 1809**

**Subfamily Hesperinae Latreille, 1809**

**Genus *Caltoris* Swinhoe, 1893**

Type species: *Hesperia kumara* Moore, 1878.

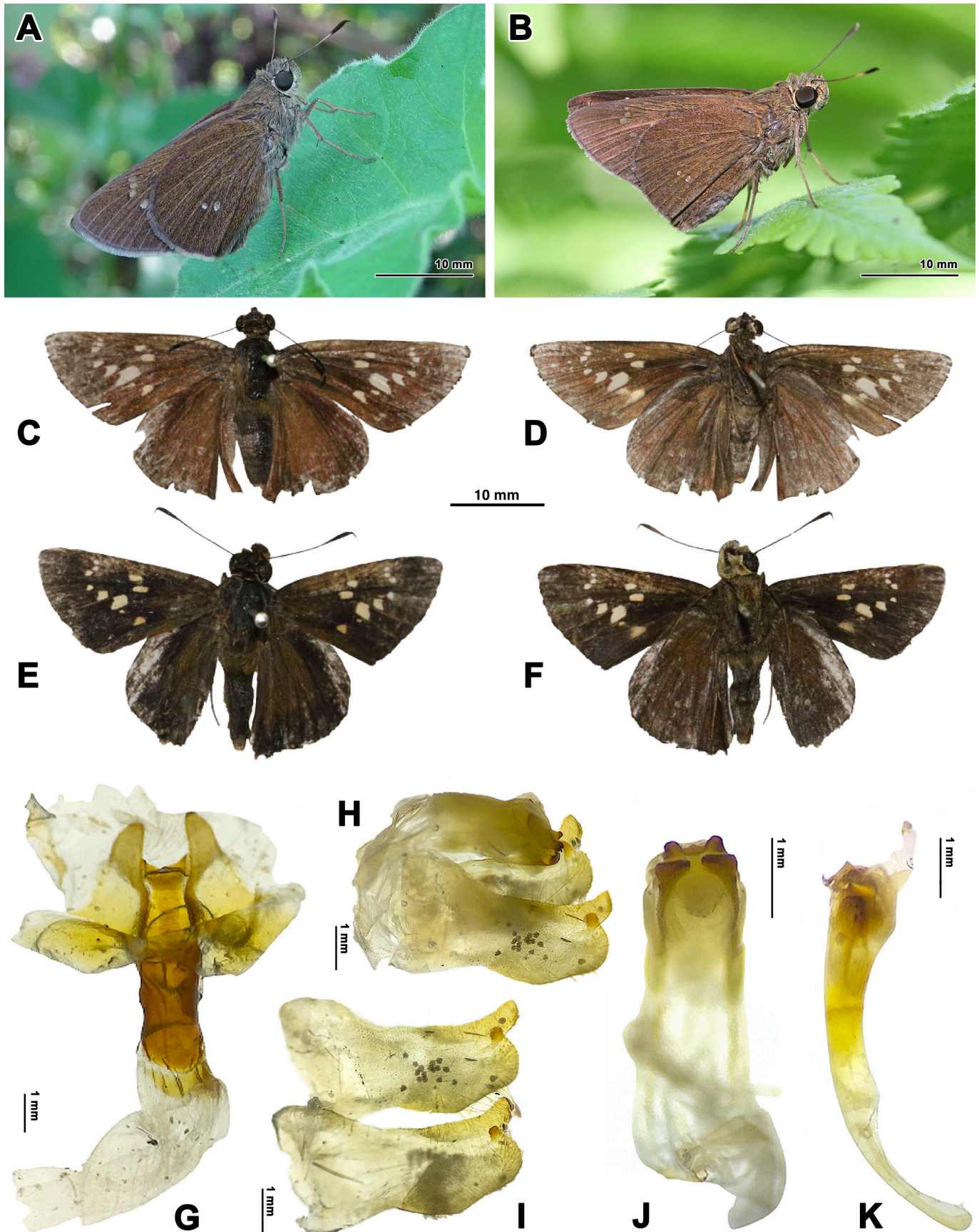
***Caltoris bromus bromus* (Leech, 1894)**

*Parnara bromus* Leech, 1894, Type locality: Chia-kou-ho, China.

**Material Examined.** 3 ♂♂, NEPAL, AFU, Rampur, Chitwan District, Bagmati Province (27°39'19.5"N 84°21'12.5"E, 162 m), 27-IX-2021; 3 ♀♀, same data label, Coll. Sajjan KC.

**Diagnosis.** *Caltoris b. bromus* can be distinguished from its sympatric congeners by, in females, usually distinctive twin spots on the ventral side of the hindwing in spaces 2 and 3 (Fig. 2A, but see Fig. 2B (male)), and the presence of well-developed spots, including cell spots, on the dorsal side of the forewing (Figs 2C, 2E) (Evans, 1949; Fleming, 1975).

**Remarks.** Reported as a new record for Nepal by the first author in KC (2022), *C. b. bromus* was frequently observed (at least 30 times) at the given location between 2019 and 2021. Notably, its occurrence in Nepal is highly localized, with no sightings recorded from elsewhere in the country. The first sighting occurred on June 25, 2019 (Fig. 2A), followed by multiple individuals observed in the same location during 2020–2021 in August and September, respectively.



**Figure 2.** *Caltoris b. bromus* (Leech, 1894). **A.** ♀, Rampur, Chitwan District, June 25, 2019; **B.** ♂, Rampur, Chitwan District, September 27, 2021; **C.** ♀, spread specimen, dorsal side; **D.** Same specimen, ventral side; **E.** ♂, spread specimen, dorsal side; **F.** Same specimen, ventral side; **G.** ♀, genitalia; **H.** ♂, genitalia capsule portion; **I.** ♂, valva pair; **J.** ♂, tegumen, ventral side; **K.** Aedeagus.

The surrounding vegetation comprised various grass species (Poaceae), *Mangifera indica* L. (Anacardiaceae), *Lantana camara* L. (Verbenaceae), *Ziziphus* Mill. sp. (Rhamnaceae), and numerous weeds.

Interestingly, while Evans (1949) noted that only females of *C. b. bromus* sometimes possess double spots on the ventral hindwing, all individuals observed in this study, including males, exhibited such spots (Figs 2A, 2B, 2D, 2F), which is consistent with the specimens shown by Inayoshi (2024). Evans (1949), Zhang et al. (2010), and Inayoshi (2024) were referred to for genitalia analysis (Figs 2G–2K), which revealed lamella postvaginalis with smooth lamella and rounded shoulders in females, longer than the lamella itself (Fig. 2G). In males, the analysis showed much longer dorsal process of the valva compared to the distal process (cuiller *sensu* Evans, 1949) (Figs 2H, 2I). Previously, the species was recorded from as close as Assam (Van Gasse, 2018), approximately 830 km east of the study area (<https://earth.google.com/web>). Its occurrence in AFU, Rampur, Chitwan District, could be attributed to accidental introduction through the transportation of grasses, its larval host plant(s), in recent years, given the study area's proximity to a grass research center. Alternatively, areas between Assam and Chitwan may have been under-sampled, leading to an incomplete understanding of its distribution.

**Distribution.** China, Hong Kong, Myanmar, Malaysia, Indonesia (Evans, 1949); NE India (Varshney & Smetacek, 2015); Laos, Thailand, Vietnam (Inayoshi, 2024); Nepal (**New Record**).

## Family Hesperidae Latreille, 1809

### Subfamily Tagiadinae Mabille, 1878

#### Genus *Celaenorrhinus* Hübner, [1819]

Type species: *Papilio eligi* Stoll, 1782.

#### *Celaenorrhinus nigricans nigricans* (de Nicéville, 1885)

*Plesioneura nigricans* de Nicéville, 1885, Type locality: Sikkim, India.

**Material Examined.** Photographic evidence: 1, sex unknown, NEPAL, Magyam, Chisapani, Syangja District, Gandaki Province (28°01'04.6"N 84°00'05.9"E, 963 m), 9-VII-2019, 12:24 PM; 1, sex unknown, NEPAL, Sarangkot, Pokhara, Kaski District, Gandaki Province (28°13'01.9"N 83°57'47.3"E, 868 m), 14-VII-2019, 4:56 PM.

**Diagnosis.** *Celaenorrhinus n. nigricans* is distinguished from its sympatric congeners by several external characters: the absence of orange spots on the dorsal hindwings; a white discal band on the dorsal forewing that extends up to the costa; forewing spot 3 completely joined to the discal band and not separate; forewing spot 1b not overlapped to the band; hindwing cilia not prominently checkered (but see Fig. 3A); antennae white in front of the clubs only (Evans, 1949; Fleming, 1975).

**Remarks.** *Celaenorrhinus* is a pantropical hesperiid genus comprising approximately 90 species globally (Bascombe et al., 1999). In Nepal, *Celaenorrhinus n. nigricans* was first documented by Colin Smith in his personal records, based on three sightings in Kaski District: Rakhi Village (June 25, 2006) and Tiger Mountain Pokhara Lodge (March 8, 2009, and July 5, 2010); however, these findings were not made publicly available. The first author encountered two individuals of this species in central Nepal in July 2019: one in Magyam, Chisapani, Syangja District, and the other in Sarangkot, Pokhara, Kaski District (see KC & Pariyar, 2019b). The prominent surrounding vegetation at both locations was comprised of bamboo (Poaceae), *Rubus paniculatus* Sm. (Rosaceae), *Schima wallichii* (DC.) Korth. (Theaceae), and *Shorea robusta* Gaertn. (Dipterocarpaceae). Since our report in KC and Pariyar (2019b), this species has been frequently observed in or near these localities (Figs 3A, 3B), including in Tanahun District, between March and November (Van der Poel & Smetacek, 2022). Particularly, it is often sighted along forest trails at the specified location in Kaski District.

**Distribution.** Sikkim to NE India (Varshney & Smetacek, 2015); Bhutan, Myanmar (Evans, 1949); Thailand, Laos, Vietnam, Malaysia (Inayoshi, 2024); Nepal (**New Record**).

## Family Nymphalidae Swainson, 1827

### Subfamily Danainae Boisduval, [1833]

#### Genus *Danaus* Kluk, 1780

Type species: *Papilio plexippus* Linnaeus, 1758.

#### *Danaus chrysippus chrysippus* (Linnaeus, 1758) - f. *alcippoides* (Moore, 1883)

*Limnas alcippoides* Moore, 1883, Type locality: Sikkim, India.

**Material Examined.** Photographic evidence: 1 ♂, NEPAL, Sarangkot, Pokhara, Kaski District, Gandaki Province (28°13'02.6"N 83°57'45.4"E, 880 m), 19-V-2019, 12:44 PM (Figs 3C, 3D).

**Diagnosis.** Originally described as a distinct species by Moore (1883) from Nepal, this form is characterized by broad white patches on its dorsal hindwings (Fig. 3C), differing from its typical orange form (Corbet & Pendlebury, 1956; Ek-Amnuay, 2012).

**Remarks.** *Danaus c. chrysippus* is a widespread and common nymphalid species in Nepal, whereas the *alcippoides* form is extremely rare. Notably, form *alcippoides* is more common in certain parts of the world, such as Malaysia (south of Penang) and Singapore, than the orange form (Corbet & Pendlebury, 1956, iNaturalist, 2024). We recorded a single individual of this form, a male (Figs 3C, 3D), on the specified date and at the specified location. Major surrounding vegetation comprised of *Castanopsis indica* (Roxb. ex Lindl.) A.DC. (Fagaceae), *Lantana camara*, *Rubus paniculatus*, and *Schima wallichii*. To our knowledge, this sighting represents the only recorded occurrence of this form in Nepal since Moore (1883), making it a significant observation. The striking disparity in abundance of this form between Singapore and Nepal suggests that environmental or ecological factors may be influencing the phenotype of this taxon. This record was originally published in KC and Pariyar (2019a).

**Distribution** (of the subspecies). Africa, S. Europe, Asia, and Australia (Smetacek, 2017).

## Family Lycaenidae Leach, 1815

### Subfamily Polyommatainae Swainson, 1827

#### Genus *Nacaduba* Moore, [1881]

Type species: *Lampides prominens* Moore, 1877.

#### *Nacaduba berenice plumbeomicans* (Wood-Mason & de Nicéville, 1881)

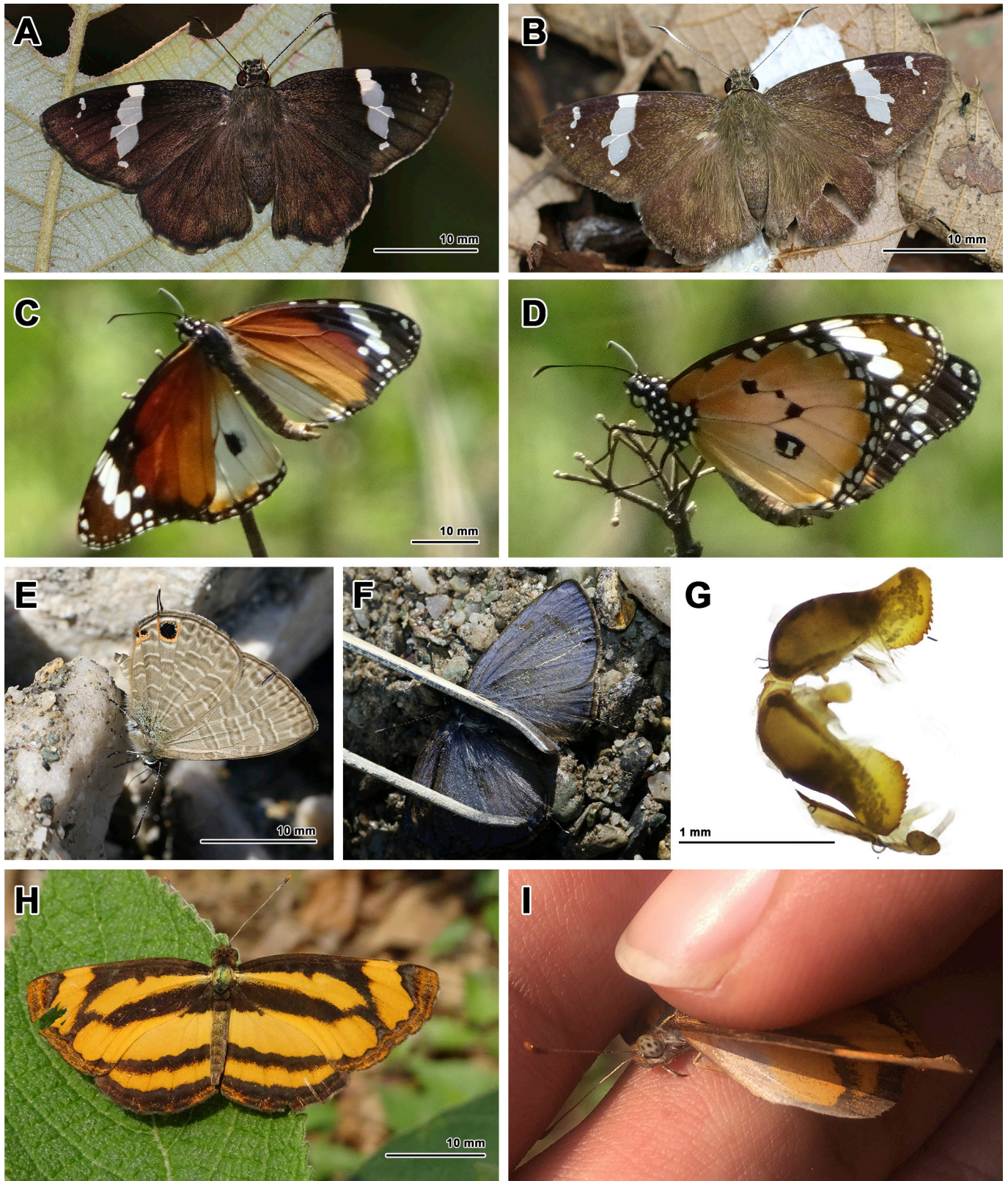
*Lampides plumbeomicans* Wood-Mason & de Nicéville, 1881, Type locality: Andamans.

**Material Examined.** 1 ♂, NEPAL, Bhedetar, Dhankuta District, Koshi Province (26°52'40.8"N 87°20'01.7"E, 610 m), 13-XI-2021, Coll. Sajan KC (Figs 3E, 3F).

**Diagnosis.** This species resembles the more widespread *N. kurava euplea* Fruhstorfer, 1916, in Nepal but can be differentiated by a combination of distinguishing characters. *Nacaduba berenice plumbeomicans* has opaque dorsal wings with a frosted appearance in males, in contrast to the quasi-transparent wings of *N. kurava*; additionally, in *N. berenice*, the postdiscal band at space 4 on the ventral forewing is dislocated rather than continuous, and the white striae on the ventral wings are duller than those in *N. kurava euplea*; furthermore, the forewing termen is convex with a rounded apex in both sexes, compared to *N. kurava* and *N. beroe* (C. & R. Felder, [1865]), where the forewing termen from spaces 2–6 is straight in males, with the apex produced (Evans, 1932, Corbet & Pendlebury, 1956, Sadasivan et al., 2021).

**Remarks.** Recorded as a species new to Nepal by the first author in KC (2022), *N. berenice plumbeomicans* was seen for the first time on March 8, 2021, in Bhedetar, Dhankuta District at 732 m elevation (26°52'36.0"N 87°19'50.0"E); a male specimen was subsequently captured on November 13, 2021, from the same location along the riverside (Figs 3E, 3F) for further study and verification. Analysis of the male genitalia revealed a serrated distal end of the valva (Fig. 3G), in contrast to the hooked shape observed in *N. kurava* (see Sadasivan et al., 2021, and Inayoshi, 2024). Major surrounding vegetation of the study area included *Castanopsis indica*, *Schima wallichii*, and *Shorea robusta*.

**Distribution.** S. India, NE India, Andaman and Nicobar Islands (Varshney & Smetacek, 2015); SE Bangladesh (Van Gasse, 2018); Nepal (**New Record**).



**Figure 3.** **A.** *Celaenorrhinus n. nigricans*, Namsikot, Tanahun District, March 15, 2021, showing atypical checkered hindwing cilia; **B.** *Celaenorrhinus n. nigricans* (de Nicéville, 1885), Sarangkot, Kaski District, May 13, 2021; **C.** *Danaus c. chrysippus* (Linnaeus, 1758) form *alcippoides* ♂, Sarangkot, Kaski District, May 19, 2019; **D.** Same specimen, ventral side; **E.** *Nacaduba berenice plumbeomicans* (Wood-Mason & de Nicéville, 1881) ♂, Bhedetar, Dhankuta District, November 13, 2021; **F.** Same specimen, dorsal side; **G.** Same specimen, valvae ventral side; **H.** *Pantoporia sandaka davidsoni* Eliot, 1969 ♂, Rampur, Chitwan District, February 23, 2020; **I.** The same specimen shows a large gray speculum along hindwing costa.

## Family Nymphalidae Swainson, 1827

### Subfamily Limenitidinae Behr, 1864

#### Genus *Pantoporia* Hübner, [1819]

Type species: *Papilio hordonia* Stoll, 1790.

#### *Pantoporia sandaka davidsoni* Eliot, 1969

*Rahinda sandaka* Butler, 1892, Type locality: N. Kanara, Karwar, India.

**Material Examined.** Photographic evidence: 1 ♂, NEPAL, AFU, Rampur, Chitwan District, Bagmati Province (27°39'10.3"N 84°21'12.1"E, 162 m), 23-II-2020, 10:53–10:58 AM (Figs 3H, 3I).

**Diagnosis.** *Pantoporia sandaka* is often mistaken for *P. hordonia* (Stoll, 1790), a common and widespread species in Nepal, owing to their similar appearances. In *P. sandaka*, the postdiscal gray line on the dorsal forewing is narrower than the submarginal orange line (Figs 3H), whereas the gray line is bolder than the orange line in *P. hordonia*, particularly, in the wet season form; in the dry season form of *P. sandaka davidsoni*, the gray postdiscal line diminishes and the orange submarginal lines get wider (Eliot, 1969, Ek-Amnuay, 2012). The gray speculum along the costa of the dorsal hindwing (Figs 3I) in male *P. sandaka davidsoni* is large and mixes with the discal band; this speculum is smaller in *P. hordonia* male (Eliot, 1969).

**Remarks.** Our team first observed *P. sandaka* in Nepal (Figs 3H, 3I) on the specified date and at the location mentioned above and subsequently reported it as a new record for Nepal in Sapkota et al. (2020). Major surrounding vegetation included *Clerodendrum infortunatum* L. (Lamiaceae), *Dalbergia sissoo* Roxb. ex DC. (Fabaceae), *Lantana camara*, *Mallotus* Lour. sp. (Euphorbiaceae), *Mikania micrantha* Kunth (Asteraceae), *Ziziphus* sp., and *Mangifera indica*. The first author was able to replicate this finding through subsequent observations in Bhorletar, Lamjung District (28°08'56.0"N 84°15'21.0"E, 500 m) throughout 2019–2020, and in Bhedetar, Dhankuta District (26°52'46.0"N 87°20'05.0"E, 640 m) in March 2021, along riparian habitats.

**Distribution.** Uttarakhand to NE India (Varshney & Smetacek, 2015); Myanmar, Thailand, Laos, Cambodia, Vietnam, China (Inayoshi, 2024); Nepal (**New Record**).

**Corrections.** The following three taxa were misidentified in our previous reports (KC & Sapkota, 2020, 2022), and we hereby correct these following further analysis and review over time.

## Family HesperIIDae Latreille, 1809

### Subfamily HesperIIDae Latreille, 1809

#### Genus *Caltoris* Swinhoe, 1893

Type species: *Hesperia kumara* Moore, 1878.

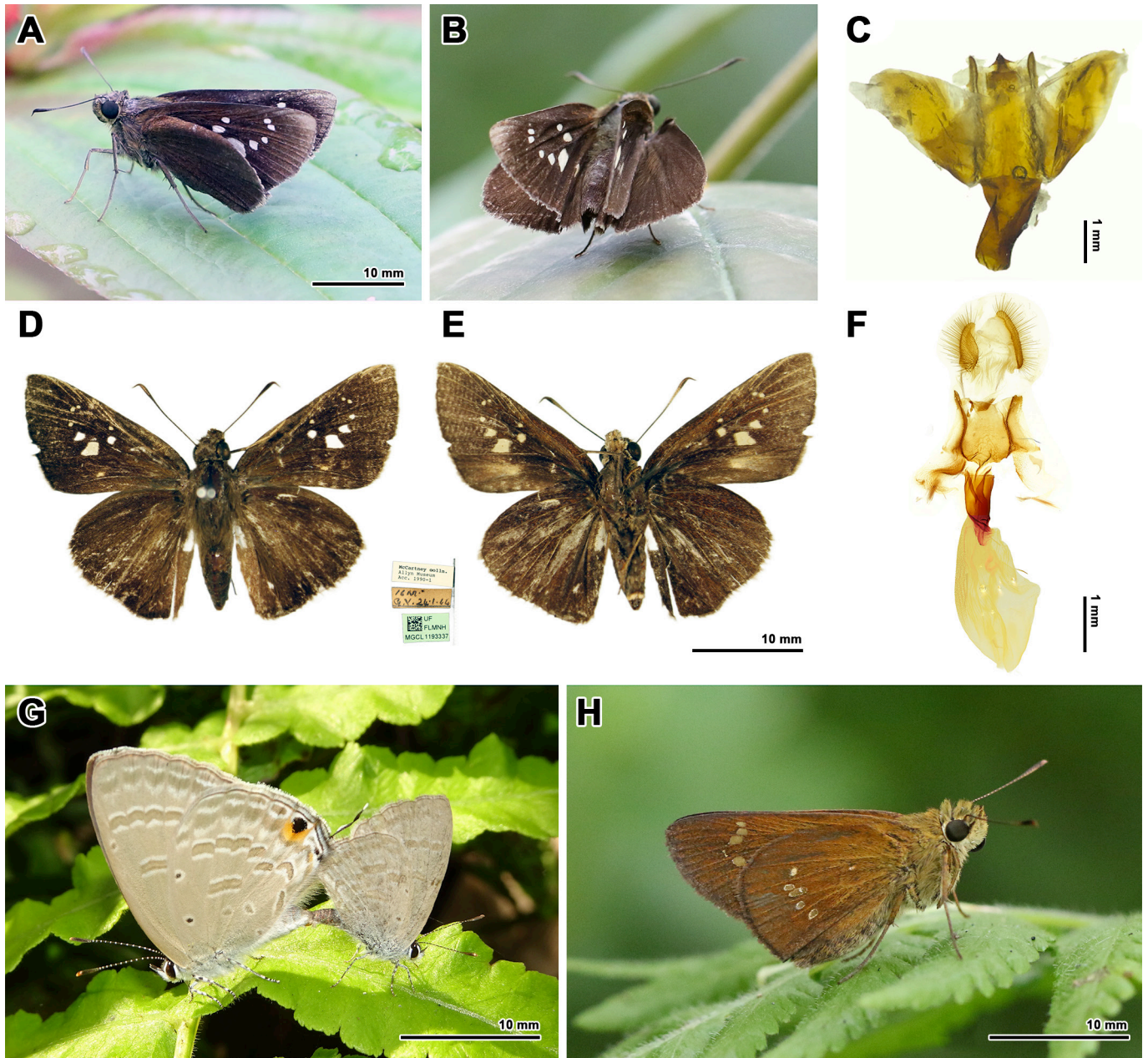
#### *Caltoris cahira austeni* (Moore, [1884])

*Baoris austeni* Moore, [1884], Type locality: Khasia Hills, Cherra Pungi, India.

**Material Examined.** 1 ♀, NEPAL, Paripatle, Dhankuta District, Koshi Province (27°00'00.1"N 87°18'37.2"E, 1300 m), 1-IX-2021, Coll. Sajan KC (Figs 4A–4C).

**Diagnosis.** Evans (1949) noted that *Caltoris* species cannot be reliably identified based solely on external morphology. According to Ek-Amnuay (2012), *C. cahira austeni* can be separated from the similar-appearing *Caltoris sirius sirius* (Evans, 1926) by its smaller size and darker brown color. Males of *C. cahira* lack a spot in space 1b of the dorsal forewing, whereas in *C. s. sirius*, it is present in both sexes, albeit small (Corbet & Pendlebury, 1956). The ventral hindwing in *C. cahira austeni* is dark chocolate-colored whereas that in *C. s. sirius* is yellowish brown (Ek-Amnuay, 2012). Reliable identification requires male genitalia analysis, which reveals a deeply divided cuiller and valva in *C. cahira austeni*, in contrast to the shallow division in *C. s. sirius* (Evans, 1949; Zhang et al., 2010). The analysis of female genitalia in this study revealed that the shoulders of the lamella postvaginalis in *Caltoris sirius fusca* (a nominotypical specimen was unavailable) are arcuate, trapeziform, and appear to extend beyond the lamella (potentially due to damage to the lamella) (Fig. 4F). In contrast, in *C. cahira austeni*, the shoulders of the lamella postvaginalis are straight, pointed, and subequal in length to the lamella (Fig. 4C, Zhang et al., 2010).





**Figure 4.** **A.** *Caltoris cahira austeni* (Moore, [1884]) ♀, Paripatle, Dhankuta District, September 1, 2021; **B.** Same specimen, partly showing dorsal wings; **C.** Same specimen, genitalia; **D.** *Caltoris sirius fusca* (Evans, 1932) ♀, in MGCL, dorsal side; **E.** Same specimen, ventral side; **F.** Same specimen, genitalia; **G.** *Catochrypsops s. strabo* (Fabricius, 1793), mating pair (left ♀, right ♂), in its natural habitat, Bhorletar, Lamjung District, March 18, 2020; **H.** cf. *Polytremis lubricans* (Herrich-Schäffer, 1869) in its natural habitat, Rampur, Chitwan District, September 26, 2021.

**Remarks.** This record, along with another from the same location, was published in KC and Sapkota (2022) as *Caltoris s. sirius* based on the presence of a spot in space 1b of the forewing (see Inayoshi, 2024); however, this character is shared by the female of *C. cahira austeni* as well (Smith, 2011, Ek-Amnuay, 2012). The latter species is more common and widespread in Nepal (Smith, 2011). Upon reexamining the female specimen collected from Paripatle, Dhankuta District (Figs 4A–4C), reconsulting Zhang et al. (2010) for reference on female genitalia, and dissecting a female specimen of *Caltoris sirius fusca* housed in MGCL (Figs 4D–4F), we realized our initial identification (*C. s. sirius*) was incorrect. Therefore, we retract the reports of *C. s. sirius* from Dhankuta District, published in KC and Sapkota (2022), and correct the identification herein to *C. cahira austeni*.

**Distribution.** Nepal (Smith, 2011); Sikkim to NE India (Varshney & Smetacek, 2015); Myanmar, Thailand, Laos, Vietnam, China, Taiwan, and Malaysia (Inayoshi, 2024).

## Family Lycaenidae Leach, 1815

### Subfamily Polyommatae Swainson, 1827

#### Genus *Catochrysops* Boisduval, 1832

Type species: *Hesperia strabo* Fabricius, 1793.

#### *Catochrysops strabo strabo* (Fabricius, 1793)

*Hesperia strabo* Fabricius, 1793, Type locality: Tranquebar, India.

**Material Examined.** Photographic evidence: 1 ♂♀ (mating pair), NEPAL, Bhorletar, Lamjung District, Gandaki Province (28°09'57.0"N 84°13'02.0"E, 460 m), 18-III-2020 (Fig. 4G).

**Diagnosis.** In *Catochrysops strabo*, the costal spot on the ventral side of the forewing is midway between the postdiscal band and the cell-end bar, whereas in *C. panormus exiguus* (Distant, 1886), the costal spot is closer to the postdiscal band (Corbet & Pendlebury, 1956, Fleming, 1975, Ek-Amnuay, 2012, Smetacek, 2017).

**Remarks.** A mating pair of *Catochrysops* sp. (Fig. 4G) was discovered at the given location along a rural trail by a riverside. Initially published as *C. panormus exiguus* in KC and Sapkota (2020), the identification was based on the diagnostic key provided above; however, we have since realized that this character is not always reliable. Perhaps a more dependable distinguishing feature is the submarginal spots on the ventral forewing of *C. panormus exiguus*, which are typically broken into arrow shapes compared to the continuous spots in *C. s. strabo* (see Inayoshi, 2024). Although this character for *C. panormus* is present in the female individual in our photograph (Fig. 4G, left individual), it is absent in the male individual (Fig. 4G, right individual), whose costal spot is not clearly visible either, and the bands are plain. Owing to the uncertainty surrounding the identification, we retract this record of *C. panormus exiguus* and propose that the individuals represent a variation of the more common and widespread *C. s. strabo*.

**Distribution.** Nepal (Smith, 2011); India, including the Andaman and Nicobar Islands (Varshney & Smetacek, 2015), to Myanmar (Inayoshi, 2024); Thailand, Laos, Cambodia, Vietnam, Hong Kong, S. China, Malaysia, and Singapore (Inayoshi, 2024).

## Family Hesperidae Latreille, 1809

### Subfamily Hesperinae Latreille, 1809

#### Genus *Polytremis* Mabille, 1904

Type species: *Gegenes contigua* Mabille, 1877.

#### *Polytremis lubricans lubricans* (Herrich-Schäffer, 1869)

*Goniloba lubricans* Herrich-Schäffer, 1869, Type locality: Java.

**Material Examined.** Photographic evidence: 1, sex unknown, NEPAL, AFU, Rampur, Chitwan District, Bagmati Province (27°39'19.5"N 84°21'12.5"E, 150 m), 26-IX-2021 (Fig. 4H).

**Diagnosis.** Dorsal forewing with hyaline discal yellow spots from spaces 2–8 except 5, and cell spots which are usually conjoined in males; spot 1b non-hyaline; hindwing (dorsal and ventral) with discal spots from spaces 2–6, spots in spaces 4 and 5 conjoined (Evans, 1949; Ek-Amnuay, 2012).

**Remarks.** At the given location, inside a mango orchard, we observed a hesperiid that resembled *Pelopidas conjuncta narooa* Moore, 1878 (Fig. 4H). The initial identification as *Pelopidas* Walker, 1870, was based on the presence of a cell spot on the ventral hindwing, a feature absent in similar Baorini, except in some cases of *Parnara* Moore [1881], where the spot is positioned differently (at the cell-end rather than the upper corner (personal observation)). Additionally, the purplish sheen on the ventral wings and the absence of a brand on the dorsal forewing (assuming it was a male) led us to confirm that it was *Pelopidas conjuncta narooa* based on Evans (1949). The record was subsequently published in KC and Sapkota (2022).

However, after comparing our images with those in Kunte et al. (2024), we reevaluated our identification and now propose it is potentially a form of *Polytremis lubricans* (Herrich-Schäffer, 1869), a more common and widespread species in the study area, although Evans (1949) noted that *Polytremis* does not have a cell spot on the ventral hindwing. To confirm the identity of *Pelopidas conjuncta narooa* in Nepal, a specimen is required, as recommended by Van der Poel and Smetacek (2022). The nominotypical subspecies has been recorded in Nepal's eastern regions twice (Van der Poel & Smetacek, 2022).

**Distribution.** Nepal (Smith, 2011), India (including the Andamans), Myanmar, Thailand, Laos, Cambodia, Vietnam, China, Malaysia, Singapore, and Indonesia (Inayoshi, 2024).

## DISCUSSION

The retraction of misidentified records underscores the difficulties in accurately identifying cryptic butterfly taxa based solely on external morphology. Even with comprehensive literature reviews, the presence of conspecific variations necessitates a more in-depth examination of specimens, often involving genitalia or molecular analysis, to confirm species identification with certainty. This is particularly relevant for taxa such as Aeromachini, Baorini, and Taractrocerini in Hesperinae (Evans, 1949; Cao et al., 2019). Among the retracted records, *Pelopidas conjuncta narooa* potentially inhabits southern Nepal, as it is known to fly in geographically close Indian states such as Jharkhand (Varshney & Smetacek, 2015); however, a male specimen is ideal for confirmation. *Caltoris sirius* is found in eastern Nepal, but owing to its close resemblance to *C. cahira*, images of a male specimen's dorsal and ventral sides are necessary, with male genitalia examination being ideal once again. *Catochrysops strabo* can typically be distinguished from *C. panormus* by the position of the costal spot on the ventral forewing, as noted in literature (Evans, 1932; Corbet & Pendlebury, 1956; Fleming, 1975; Ek-Amnuay, 2012; Smetacek, 2017). However, variation occurs, with the spot sometimes appearing closer to the postdiscal band, as seen in *C. panormus*.

Furthermore, this study also involves the republishing of findings previously published in questionable journals, as identified on Beall's list. Among the republished records, *Caltoris b. bromus* is potentially present in other locations than Rampur, Chitwan District, particularly across the eastern Terai region, and identification can be reliably confirmed from photographs that show both dorsal and ventral sides. In the study area's population, all individuals consistently display two spots on the ventral hindwing in spaces 2 and 3, a trait that differs from *Caltoris b. bromus* as described by Evans (1949), Fleming (1975), and Ek-Amnuay (2012), who note these spots as inconsistent, often present only in females. This suggests the study area's population might represent a distinct subspecies, warranting further research. *Celaenorhinus n. nigricans* has recently become more common in Pokhara and likely occurs in districts beyond Kaski, Syangja, and Tanahun. The *alcippoides* form of *Danaus c. chrysippus* remains rare in Nepal, probably owing to the absence of favorable conditions for its development. *Nacaduba berenice plumbeomicans* is not rare in eastern Nepal, particularly in Dhankuta District, and most certainly inhabits neighboring districts as well. Regarding *Pantoporia sandaka davidsoni*, which is distributed from Uttarakhand to northeast India (Varshney & Smetacek, 2015), it is likely to be widespread across Nepal as well, where it frequently co-occurs with *P. h. hordonia*, leading to confusion in identification.

In conclusion, this study reaffirms and corrects the previously reported butterfly records of Nepal. The decision to republish certain records and retract the erroneous ones was made to uphold the integrity and accuracy of the research, as the original publications may not have met rigorous scientific standards despite the findings being vital contributions to the documentation of Nepal's butterfly fauna. By acknowledging and addressing past errors, we can strengthen the foundation of our knowledge and foster a more reliable and accessible scientific record. Ultimately, this study aims to promote a culture of transparency, accountability, and excellence in scientific research, ensuring that our understanding of the natural world is built on a foundation of accuracy and integrity.

## AUTHOR'S CONTRIBUTION

The authors confirm their contribution to the paper as follows: Sajan KC and Anisha Sapkota: conducted the examination of materials at MGCL and other sources, and wrote and revised the manuscript. Surendra Pariyar: examined the materials at ANHM. The authors read and approved the final version of the manuscript.

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## AVAILABILITY OF DATA AND MATERIAL

The specimens listed in this study are deposited in the Annapurna Natural History Museum, Pokhara, Kaski District, Nepal (ANHM) and are available from the curator, upon request.

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study only included plants and arthropod material, and all required ethical guidelines for the treatment and use of animals were strictly adhered to in accordance with international, national, and institutional regulations. No human participants were involved in any studies conducted by the authors for this article.

## CONSENT FOR PUBLICATION

Not applicable.

## CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this paper.

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## تصحیح سوابق گزارش پروانه‌های نپال: خوداصلاحی و یادداشت‌هایی بر گونه‌های ثبت شده پروانه‌های دم‌چلچله‌ای (Lepidoptera)

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**چکیده:** مستندسازی و شناسایی دقیق گونه‌ها، همراه با انتشار یافته‌ها در منابع بررسی علمی داوری، برای ارتقای دانش تنوع زیستی و هدایت مؤثر فعالیت‌ها در زمینه حفاظت از گونه‌ها ضروری است. در این مقاله، ما اصلاحاتی در گزارشات قبلی گونه‌های پروانه‌ای که قبلاً از نپال مستند کرده‌ایم ارائه می‌دهیم و شناسایی‌های آنها را بر اساس اطلاعات جدید به‌روز می‌کنیم. گزارش سه گونه که به نادرستی شناسایی شده بودند به این شرح اصلاح شده‌اند: *Pelopidas* و *Catochrysops panormus exiguus* (Distant, 1886)، *Caltoris sirius sirius* (Evans, 1926) *conjuncta narooa* Moore, 1878. علاوه بر این، ما گزارش چهار گونه دیگر شامل *Caltoris bromus bromus* (Leech, 1894)، *Celaenorrhinus nigricans nigricans* (de Nicéville, 1885)، *Nacaduba berenice* (Wood-Mason de Nicéville, 1881) *plumbeomicans* (Eliot, 1969) و *Pantoporia sandaka davidsoni* و یک فرم، *Danaus chrysippus chrysippus* (Linnaeus, 1758) f. *alcippoides* (Moore, 1883) که پیش از این در نشریات مشمول فهرست نشریات غیرمعتبر گزارش شده بودند را به منظور اطمینان از اصالت آنها، دوباره اعتبارسنجی کرده‌ایم. هدف ما ارائه یک منبع مرجع قابل اعتماد، اصلاح شده و معتبر برای این گزارشات است که دقت مستندسازی پروانه‌های در نپال را افزایش دهد.

**واژگان کلیدی:** تنوع زیستی، هیمالیا، تصحیح، حفاظت، تاکسونومی