




A review of the genus *Rapala* Moore, 1881 (Lepidoptera: Lycaenidae: Theclinae) of Nepal with insights on little-known species

SAJAN KC^{1*}, PIET VAN DER POEL², SURENDRA PARIYAR³, AMAN SUNAR⁴ & MAHENDRA SINGH LIMBU⁵



¹McGuire Center for Lepidoptera and Biodiversity, University of Florida, Gainesville, FL, USA

*  Sajankc143@gmail.com;  <https://orcid.org/0000-0002-2749-0738>

²Independent Researcher, Noordwijkerhout, the Netherlands

 pipoel@yahoo.com;  <https://orcid.org/0009-0000-7545-2050>



³Annapurna Natural History Museum, Pokhara, Kaski District, Gandaki Province, Nepal

 surendraguidel@gmail.com;  <https://orcid.org/0009-0000-0243-1937>

⁴Prithvi Narayan Campus, Pokhara, Kaski District, Gandaki Province, Nepal

 sunarama.as106@gmail.com;  <https://orcid.org/0009-0009-7900-981X>

⁵Pati, Lalitpur District, Bagmati Province, Nepal

 mahen_limbu@yahoo.com;  <https://orcid.org/0009-0003-4342-7530>

Abstract

The taxonomy of *Rapala* Moore, 1881 in Nepal remains problematic due to historical misidentifications, taxonomic reclassifications, and the absence of comprehensive identification keys. This study reviews *Rapala* species documented in Nepal based on field observations by the authors, available citizen science data, literature review, and museum specimens. A total of 13 *Rapala* species are recognized from Nepal under current taxonomy. The historical taxonomic confusion between *Rapala rectivitta* (Moore, 1879) and *R. rosacea* de Nicéville, [1889], in Nepal is discussed, with *R. rosacea*, having previously been considered as *R. rectivitta*, formally recognized in Nepal's butterfly fauna for the first time. Additionally, new evidence of *R. rectivitta* from Nepal is provided. The taxonomic status of *R. huangi* Nakamura & Seki, 2017 is reaffirmed as valid, warranting its inclusion in Nepal's faunal list. It is also documented for the first time from NE India. The status of *R. hinomaru* Fujioka, 1970 is revised; we propose it as a junior subjective synonym of *R. nissa* (Kollar, [1844]), **syn. nov.** To facilitate species identification, images of live and spread specimens of all the documented *Rapala* species in Nepal are provided, along with images of male and female genitalia and dichotomous keys.

Key words: butterflies, Deudorigini, flashes, hairstreaks, Himalaya, taxonomy

Introduction

Rapala Moore, 1881 is a genus of lycaenid butterflies comprising approximately 80 species, primarily distributed across the Austro-Oriental realm, with species also occurring in the Palearctic (Evans 1932; Corbet & Pendlebury 1978; Ek-Amnuay 2012; COL 2025; iNaturalist 2025). Of these, about 18 species are found on the Indian subcontinent (Van Gasse 2018). These butterflies are characterized by their rapid flight, during which they reveal their often-iridescent dorsal coloration. They also flash this coloration while perching, which potentially inspired their common name, “flash” (Kehimkar 2008). Diagnostic characters include a pair of hindwing tails, postdiscal bands and cell-end bars on the ventral wings, a circular to elongate male brand above the origin of vein 7 on the dorsal hindwings—reflected as a bulge on the ventral side—a black tornal spot on the ventral hindwing often crowned with orange (Evans 1932; Wynter-Blyth 1957; Corbet & Pendlebury 1978; Ek-Amnuay 2012), and a tuft of scales on the dorsum of the ventral forewing, except in a few species (Wynter-Blyth 1957). Species range from having blue dorsal wings, with or without iridescence, to orange or red dorsal wings; females are typically duller dorsally than males. Additionally, males possess a pair of small, stout, conjoined valvae of the genitalia, which are evenly tapered with rounded apices (Corbet & Pendlebury 1978). The aedeagi are large, with apices typically distinctive among

species (personal observation; Corbet 1939). The species can also be distinguished by the shape of the distal end of the ductus bursae in the female genitalia and, in some cases, by the shape of the anterior apophysis (Nakamura & Seki 2019). In contrast, the posterior apophysis is generally similar across most species, being approximately twice the length of the anal papillae with bent apex (personal observation). *Rapala* is closely related to other genera in the tribe Deudorini, such as *Deudorix* Hewitson, 1863 (= *Virachola* Moore, 1881), *Sinthus* Moore, 1884, and *Artipe* Boisduval, 1870.

The butterfly fauna of Nepal represents that of the Central Himalayas. With elevations ranging from 60 m to approximately 8,848 m (Dhital 2015; Xie *et al.* 2021), it encompasses species from both the Oriental and Palearctic realms. The *Rapala* species of Nepal were previously listed by Smith (1994, 2006, 2010, 2011a), documenting 12 species, all of which are covered in this study except *Rapala refulgens* de Nicéville, 1891 which was recently reclassified as *Deudorix refulgens* (de Nicéville, 1891) by Huang (2023) based on male genitalic characters. Meanwhile, *R. rosacea* de Nicéville, [1889] has historically been treated as *R. reactivitta* (Moore, 1879) in all Nepali literature to date, to our knowledge, and thus was never included in any available checklist including the most recent one by Van der Poel & Smetacek (2022). Additionally, two species of *Rapala* described from Nepal, *R. hinomaru* Fujioka, 1970, and *R. huangi* Nakamura & Seki, 2017, have often been overlooked or considered invalid taxa in the butterfly checklists of Nepal and have consequently received little attention, including in India. Smith (2010) treated *R. hinomaru* as a form of *R. nissa* (Kollar, [1844]), listing it as a redundant or erroneous name, which later was listed as a tentative species by Van der Poel & Smetacek (2022); however, no literature has formally proposed the synonymy or *nomen dubium* status of *R. hinomaru* hitherto. Meanwhile, *R. huangi*, despite being described in 2017 from Nepal and India, has largely gone unnoticed by subsequent researchers in both countries. Furthermore, frequent misidentifications have occurred among visually similar species, such as *R. manea* (Hewitson, 1863) and *R. scintilla* de Nicéville, 1890, as well as *R. reactivitta* and *R. nissa*, owing to the absence of comprehensive identification keys.

The aim of this paper is to review all the *Rapala* species recorded from Nepal, clarify the occurrences of *R. rosacea* and *R. reactivitta* in Nepal, reassess the taxonomic status of *R. hinomaru* and *R. huangi*, and provide reliable identification characters to aid in the field identification of *Rapala* species in this region.

Materials and Methods

Specimens of *Rapala* examined in this study are housed in the following collections:

ANHM: Annapurna Natural History Museum, Pokhara, Nepal

SNHM: Natural History Museum, Swayambhu, Kathmandu, Nepal

CUBM: Chubu University Butterfly Museum, Kasugai, Japan

MGCL: McGuire Center for Lepidoptera and Biodiversity, Gainesville, Florida, USA

Owing to limited manpower for genitalia analysis of spread specimens in the Nepalese collections, only the genitalia of *R. rosacea* were examined from Nepal, as its occurrence in Nepal had never been verified. For species whose occurrences in Nepal have been previously reported/verified (see Smith 1994, 2006, 2010, 2011a; Nakamura & Seki 2017), specimens from northwestern and northeastern India housed at MGCL were used as references for habitus and genitalia, as they belong to the same subspecies and are geographically close to Nepal – the genitalia of many of these species may not have been properly illustrated hitherto. Owing to the distinct shape of the ductus bursae in almost all the studied species, only this part is illustrated for the female genitalia. Reference specimens for *R. dienece* (Hewitson, 1878), *R. damona* Swinhoe, 1890, and *R. scintilla* de Nicéville, 1890 were sourced from locations outside India but still representing the same subspecies. Additionally, images of all the species (except *R. damona* Swinhoe, 1890) in their natural habitats in Nepal are included to further support their presence (Fig. 1). Occurrence records available on iNaturalist (2025) and GBIF (2025) were used to supplement the observation data by the authors. Images of the MGCL specimens were captured using a Canon EOS 7D camera equipped with a Canon EF-S 60 mm f/2.8 Macro USM lens. Genitalia were prepared by soaking in a 10% KOH solution overnight at room temperature, then dissected under a Leica MZ16 stereomicroscope. Photographs of the genitalia were taken using Auto-Montage Pro 5.01 system (Syncroscopy, Cambridge, UK) at the Florida State Collection of Arthropods, Gainesville, Florida, USA, using a JVC KY-F75U 3-CCD digital camera (Victor Co. of Japan Ltd.) and a Leica Z16 APO lens. Image stacking was performed with Auto-Montage Pro 5.01, while post-processing was conducted using

Photopea (<https://www.photopea.com/>) and MacBook Preview (Version 11.0). The examined genitalia from MGCL are preserved in glycerin-filled genitalic vials, each labeled with a unique number corresponding to the respective specimen. The dissection of *R. rosacea* from Nepal was conducted in the Zoology Laboratory of Prithvi Narayan Campus, Pokhara, Nepal. Elevation data of the examined specimens, originally recorded in feet, were converted to meters and rounded off to the nearest 5 meters for consistency. Species distribution maps were generated in RStudio (Version 2023.03.0+386), with confirmed occurrence regions shown in red, tentative records in blue, and areas without records in gray; distribution zones follow the butterfly biogeographic classification of Van der Poel & Smetacek (2022). Information on wingspan is sourced from Ek-Amnuay (2012), Nakamura & Seki (2017), and Van der Poel & Smetacek (2022), while details on phenology, distribution, and adult natural history are supplemented by Van der Poel & Smetacek (2022), GBIF (2025), and iNaturalist (2025). Evans (1932), Corbet (1939), Wynter-Blyth (1957), Fleming (1975), Smith (1994, 2006, 2011a, b, c), Kehimkar (2008, 2016), Ek-Amnuay (2012), Smetacek (2017), Bhakare & Ogale (2018), Van der Poel & Smetacek (2022), and Inayoshi (2024) were used for morphological analysis. FUNET (2025) was consulted for the original species description literature, while the nomenclature of wing venation follows Evans (1949) and that of the genitalia is based on Klots (1970).

Results

Key to Adult *Rapala* Moore, 1881 and Related Theclinae Genera from Nepal

1. One pair of tails; ventral side with only postdiscal lines and cell-end bars (except *R. pheretima* and *Deudorix perse*) apart from faint submarginal lines; male may have a swollen brand at the base of space 7 on the ventral hindwing. 2 *Rapala*, *Deudorix* (including *Virachola* Moore, 1881)
- One or two pairs of tails; ventral side with other spots as well or blank; male without a swollen brand at the base of space 7 on the ventral hindwing. other Theclinae
2. Ventral bands always wide; hindwing band strongly broken, margins of band in space 6 and 7 not aligned; male without a swollen brand at the base of space 7 on the ventral hindwing. *Deudorix* Hewitson, 1863 (including *Virachola*)
- Ventral bands narrow to wide; hindwing band mostly straight, margins of band in space 6 and 7 more or less aligned; male with a swollen brand at the base of space 7 on the ventral hindwing. *Rapala* Moore, 1881

Key to Adult *Rapala* Moore, 1881 Species in Nepal

For convenience, the *Rapala* species of Nepal are divided into two groups: the wide-banded (*R. varuna*) group and the narrow-banded (*R. pheretima*) group.

Wide-banded flashes: *R. varuna* group

1. Ventral bands wide (double), with a gap in the middle of a fainter color (Figs 2–10). 2
- Ventral bands narrow (single) without such a gap in the middle (Figs 11–15) 9
2. Ventral bands very wide; spot 7 on the ventral hindwing not smaller than spot 6; ventral hindwing cell-end bar connected to or very close to the postdiscal band (Fig. 2). *Rapala varuna orseis* Hewitson, 1863
- Ventral bands less wide; spot 7 on the ventral hindwing may be smaller than spot 6; ventral hindwing cell-end bar distant from the postdiscal band (Figs 3–10) 3
3. Dorsal side with prominent red or orange areas on both wings, often visible ventrally as faint red patches or along wing margins (Figs 3, 4) 4
- Dorsal side without prominent red or orange areas (two species, *R. nissa* and *R. huangi*, can have small orange spots on dorsal forewings only) (Figs 5–10). 5
4. Ventral wings often ash gray; band margins lunulate; ventral hindwing band 1c about straight; red on dorsal wings extends to the wing bases (Fig. 3) *R. iarbus iarbus* (Fabricius, 1787)
- Ventral wings not ash gray; band margins straight; ventral hindwing band 1c sinuate; orange on dorsal wings does not extend to the wing bases (Fig. 4) *R. selira* (Moore, 1874)
5. Ventral wings often slatey gray, sometimes brownish to purplish; never with a bronze color in the middle of the postdiscal bands (Figs 5, 6) 6
- Ventral wings often yellowish to purplish, seldom slatey gray; almost always with a bronze color in the middle of the postdiscal bands (Figs 7–10) 7
6. Ventral wings gray or brownish to purplish without greenish tinge; ventral hindwing submarginal lunules often prominent; dorsal side iridescent blue on both wings in male (Fig. 5). *R. manea schistacea* (Moore, 1879)

- Ventral wings gray with greenish tinge in males; ventral hindwing submarginal lunules faded; dorsal side iridescent blue on hindwings only in male (Fig. 6) *R. scintilla scintilla* de Niceville, 1890
- 7. Dorsal side deep iridescent blue on both wings in male even when viewed at around 180°; dorsal forewing without an orange spot; ventral bands often darker, smoother, and less white-edged than in the next species (Fig. 7) *R. rectivitta* (Moore, 1879)
- Dorsal side purplish-blue on both wings in male which vanishes when viewed at around 180°; dorsal forewing often with an orange spot; ventral bands often lighter, more broken, and more white-edged than in the previous species (Figs 8–10). 8
- 8. Ventral forewing postdiscal band almost a straight line or slightly curved inward, rarely curved outward; aedeagus vesica flat without claw-like cornuti (Figs 8, 9) *R. nissa nissa* (Kollar, [1844])
- Ventral forewing postdiscal band almost always curved outward; aedeagus vesica with a pair of claw-like cornuti (Fig. 10) *R. huangi* Nakamura & Seki, 2017

Narrow-banded flashes: *R. pheretima* group

- 9. Ventral forewing cell-end bar distinctly dark, mid-cell spot mostly present (Fig. 11). *R. pheretima petosiris* (Hewitson, 1863)
- Ventral forewing cell-end bar not distinctly dark, often faded, mid-cell spot never present (Figs 12–15) 10
- 10. Male with a dark discal brand on the dorsal forewing; ventral hindwing band as short, white-edged, serially dislocated lines, spot 2 and 3 fully separate; ventral side ochraceous (male) to deep yellow (female); band in ventral hindwing space 1 very wide (Fig. 12) *R. tara* de Niceville, [1889]
- Male without a discal brand on the dorsal forewing; ventral hindwing band more arranged, spot 2 and 3 not fully separate; ventral side pink to ochraceous; band in ventral hindwing space 1 narrower (Figs 7–10, 13–15) 11
- 11. Ventral side mostly with a pink shade, sometimes ochraceous; dorsal side with blue (Figs 7–10, 13) 12
- Ventral side never with a pink shade, always ochraceous; dorsal side brown in female and red in male (Figs 14–15) 13
- 12. Ventral side deeply pink extending to palpi; postdiscal band without distinct bronze color (Fig. 13) *R. rosacea* de Niceville, [1889]
- Ventral side faintly pink to ochraceous, pink often not extending to palpi; postdiscal band with distinct bronze color (Figs 7–10). 7
- 13. Tonal patch of blue speckles in ventral hindwing space 1c far away from the band; orange crown of tonal spot 2 often prominent; forewing postdiscal band often straight; dorsal red color on the hindwing in males does not extend to space 7 (Fig. 14). *R. dienece dienece* (Hewitson, 1878)
- Tonal patch of blue speckles in ventral hindwing space 1c very close to the band; orange crown of tonal spot 2 often smeared; forewing postdiscal band often bent or curved; dorsal red color on the hindwing in males extends to space 7 (Fig. 15). *R. damona* Swinhoe, 1890

Genus *Rapala* Moore, 1881

Rapala Moore, 1881: 105

Type species: *Thecla varuna* Horsfield, [1829]

Type locality: Java (Indonesia)

1. *Rapala varuna orseis* Hewitson, 1863 Figs 1a, 2

Deudorix orseis Hewitson, 1863: 23

Type locality: Sumatra (Indonesia)

Common Name: Indigo Flash

Taxonomic Note: *Rapala varuna gebenia* Fruhstorfer, 1914 should be a junior synonym of *R. v. orseis* Hewitson, 1863 as was treated by Evans (1932).

Material Examined: **NEPAL. Bagmati Province. Makawanpur.** Machan Camp, 23.iii.1991, 215 m, leg. C.P. Smith (ANHM, 1♂); Harda Khola, 13.ii.1992, 340 m, leg. C.P. Smith (ANHM, 1♂). **Chitwan.** Mahendra Forest, 3.iii.1986, 200 m, leg. C.P. Smith (ANHM, 1♂). **INDIA. Meghalaya.** Khasi Hills, leg. Le Moul, MGCL 1201234, Genitalic Vial KW-24-93 (MGCL, 1♂) (Fig. 2a). **MYANMAR. Nam La.** Namtu, 3.xi.1963, leg. S&L Steinhauser, MGCL 1202185, Genitalic Vial KW-24-113 (MGCL, 1♀) (Fig. 2b).

Wingspan: 28–35 mm (Van der Poel & Smetacek 2022).

Diagnosis (Figs 2a, 2b): *Rapala varuna* can be distinguished from congeners in Nepal by its wide postdiscal bands on the ventral wings and the cell-end bar on the ventral hindwing, which often connects to the postdiscal band. While *R. varuna* is generally distinct from its congeners, it can sometimes be confused with *Deudorix epijarbas*

(Moore, [1858]) ventrally; however, it can be differentiated by its hindwing postdiscal band, which remains unbroken at space 7. When the bands are narrower, it may resemble *R. manea*, but it can be distinguished by spot 7 on the ventral hindwing, which is not smaller than spot 6 in *R. varuna*. Males have shining dark blue on the dorsal wings without lateral iridescence, whereas females exhibit a dull blue coloration.

Male Genitalia (Figs 2c–2e): Aedeagus with distal margin of vesica serrated and a longitudinal cleft in the middle; slender valvae blunt at the apices; cleft between the valvae slightly more than 1/3rd the length of the valval plate.

Female Genitalia (Fig. 2f): Anterior apophysis short and pointed; ductus bursae widens medially, narrows near the distal portion forming a neck with a wide and smoothly convex head; corpus bursae with a long, slender, longitudinal line of signum on either side with rows of minute spines inside arranged laterally.



FIGURE 1. *Rapala* Moore, 1881 species of Nepal in natural habitats. All images are © Sajjan KC unless stated otherwise. The dorsal sides correspond to the same individuals shown from the ventral sides unless otherwise specified. a. *Rapala varuna orseis* Hewitson, 1863 ♂; b. *R. iarbus iarbus* (Fabricius, 1787) ♀ © Piet van der Poel; c. *R. selira* (Moore, 1874) ♀ © Richard C. Hoyer/Birdernaturalist (dorsal side different individual); d. *R. manea schistacea* (Moore, 1879) ♂; e. *R. scintilla scintilla* de Nicéville, 1890 ♂; f. *R. reactivitta* (Moore, 1879) ♂ © Albert Vliegenthart; g. *R. nissa nissa* (Kollar, [1844]) ♂; h. *R. huangi* Nakamura & Seki, 2017 ♀; i. *R. pheretima petosiris* (Hewitson, 1863) ♂; j. *R. rosacea* de Nicéville, [1889] ♂; k. *R. tara* de Nicéville, [1889] ♂; l. *R. cf. dieneces dieneces* (Hewitson, 1878) ♀.

Biology: Larvae have been documented feeding on the flowers of *Combretum indicum* (L.) De Filippis (Wynter-Blyth 1957), *Litchi chinensis* Sonn., *Nephelium lappaceum* L., *Ziziphus rugosa* Lam. (Ek-Amnuay 2012), and *Z. xylopyrus* (Retz.) Willd. (Swinhoe 1911), as well as on *Sapindus saponaria* L. and *Lantana camara* L. (Wynter-Blyth 1957; Kehimkar 2008). They have also been recorded feeding on the fruits of *Psidium guajava* L. (Jayaraj *et al.* 1961).

Variation: Individuals exhibit considerable variation in the width of the postdiscal bands, ranging from as wide as in *Deudorix epijarbas* to as narrow as in *Rapala manea*. The cell-end bar on the ventral hindwing may not always be connected to the postdiscal band but can be positioned very close to it; that on the ventral forewing may be connected to or distant from the postdiscal band. The ventral ground color varies, appearing predominantly slate gray in females, and brownish to grayish with an indigo-blue sheen in males.

Natural History: Adults are commonly found on flowers, in forests and forest edges, along stream banks, and on moist soil (Sondhi *et al.* 2013; Van der Poel & Smetacek 2022).

Phenology in Nepal: February to December (Van der Poel & Smetacek 2022).

Elevation: 90–1,550 m (Smith 1994; Van der Poel & Smetacek 2022).

Distribution on the Indian Subcontinent: Eastern to northeastern India, Andamans, Nepal, Bhutan, and Bangladesh (Van Gasse 2018).

Distribution in Nepal: Terai region, Gandaki Province including the Pokhara Valley, Bagmati Province including the Kathmandu Valley, and Koshi Province (Van der Poel & Smetacek 2022).

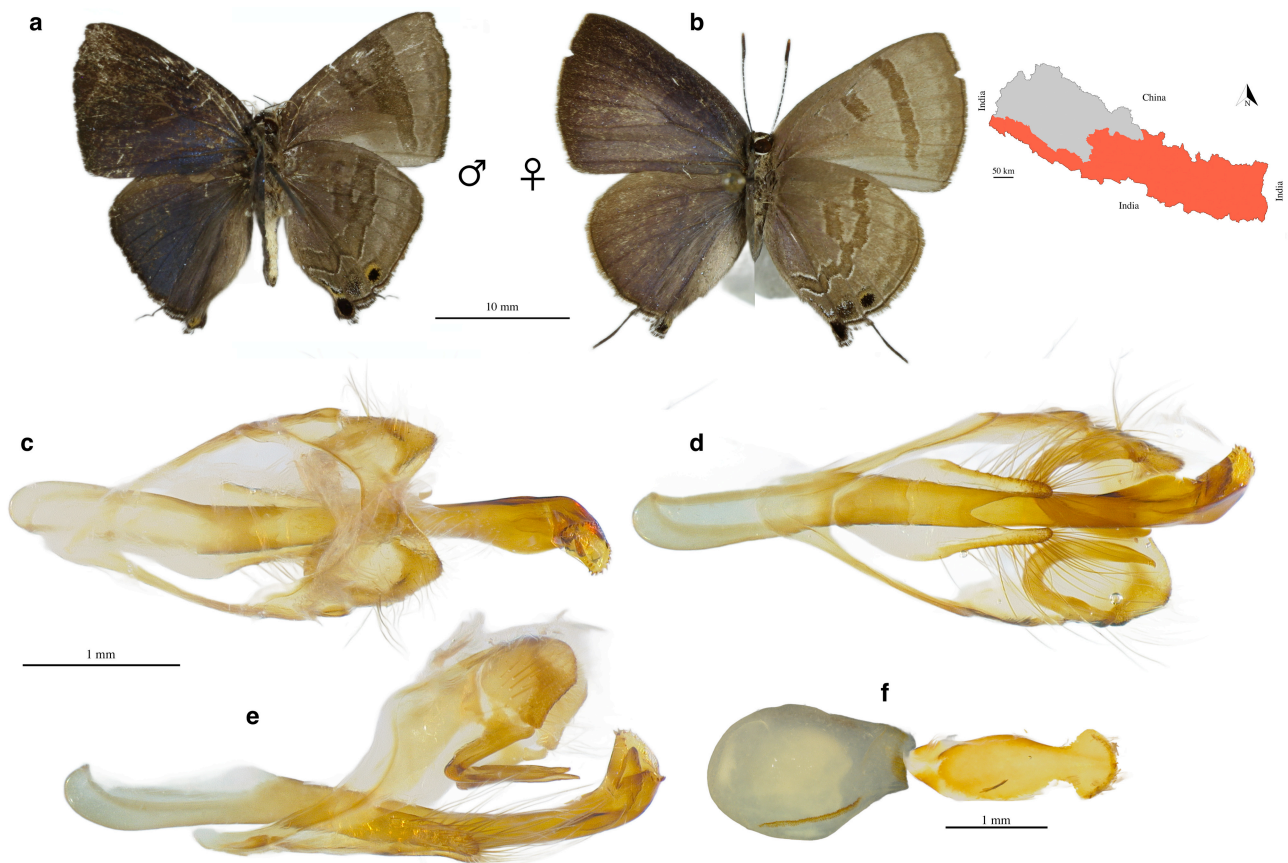


FIGURE 2. *Rapala varuna orseis* Hewitson, 1863, with distribution map indicating confirmed occurrences (red) and areas lacking records (gray) in Nepal. a. Male spread specimen from Khasi Hills, India; b. Female spread specimen from Nam La, Myanmar; c. Male genitalia dorsal view; d. Male genitalia ventral view; e. Male genitalia lateral view; f. Female genitalia, ductus and corpus bursae.

2. *R. iarbus iarbus* (Fabricius, 1787) Figs 1b, 3

Papilio iarbus Fabricius, 1787: 68

Type locality: Siam (Thailand)

Common Name: Common Red Flash

Material Examined: **NEPAL. Gandaki Province. Gorkha.** Luitel East, 16.ix.1968, 885 m, leg. C.P. Smith (ANHM, 1♂). **Kaski.** Pakha, 11.xi.1989, 1010 m, leg. C.P. Smith (ANHM, 1♂). **Tanahun.** 26.viii.1989, leg. S. Pariyar (ANHM, 1♀). **Lumbini Province. Rupandehi.** Butwal, 29.ix.1971, 125 m, leg. C.P. Smith (ANHM, 1♂). **INDIA. Meghalaya.** Khasi Hills, vii.1893, MGCL 1201230, Genitalic Vial KW-24-90 (MGCL, 1♂) (Fig. 3a). **West Bengal.** Darjeeling, 10.ii.1990, MGCL 1201231, Genitalic Vial KW-24-108 (MGCL, 1♀) (Fig. 3b).

Wingspan: 33–41 mm (Van der Poel & Smetacek 2022).

Diagnosis (Figs 3a, 3b): *Rapala iarbus* can be distinguished from its congeners by its red dorsal coloration, with the forewing veins prominently dark in males. It resembles *R. pheretima* dorsally but can be distinguished by the presence of a stubby tail on vein 3, which is absent in *R. pheretima*, and by the sharply defined and much darker red patch on the dorsal forewing in males. The female *R. iarbus* has a dorsal red color suffused across the entire forewings, unlike in *R. pheretima* males. Ventrally, *R. iarbus* can be distinguished from *R. manea* by its distinctly orange cilia and from *R. selira* by its ash gray to slate gray coloration.

Male Genitalia (Figs 3c–3e): Aedeagus vesica with a longitudinal cleft in the middle with serrated margin in lateral view; valvae wide basally and narrowed apically; cleft between the valvae slightly less than half the length of the valval plate.

Female Genitalia (Fig. 3f): Anterior apophysis longer than most other *Rapala*; ductus bursae widens apically, distal end triangular and strongly pointed like an arrow; corpus bursae with a longitudinal slender signum on either side at the basal half with rows of minute spines inside.

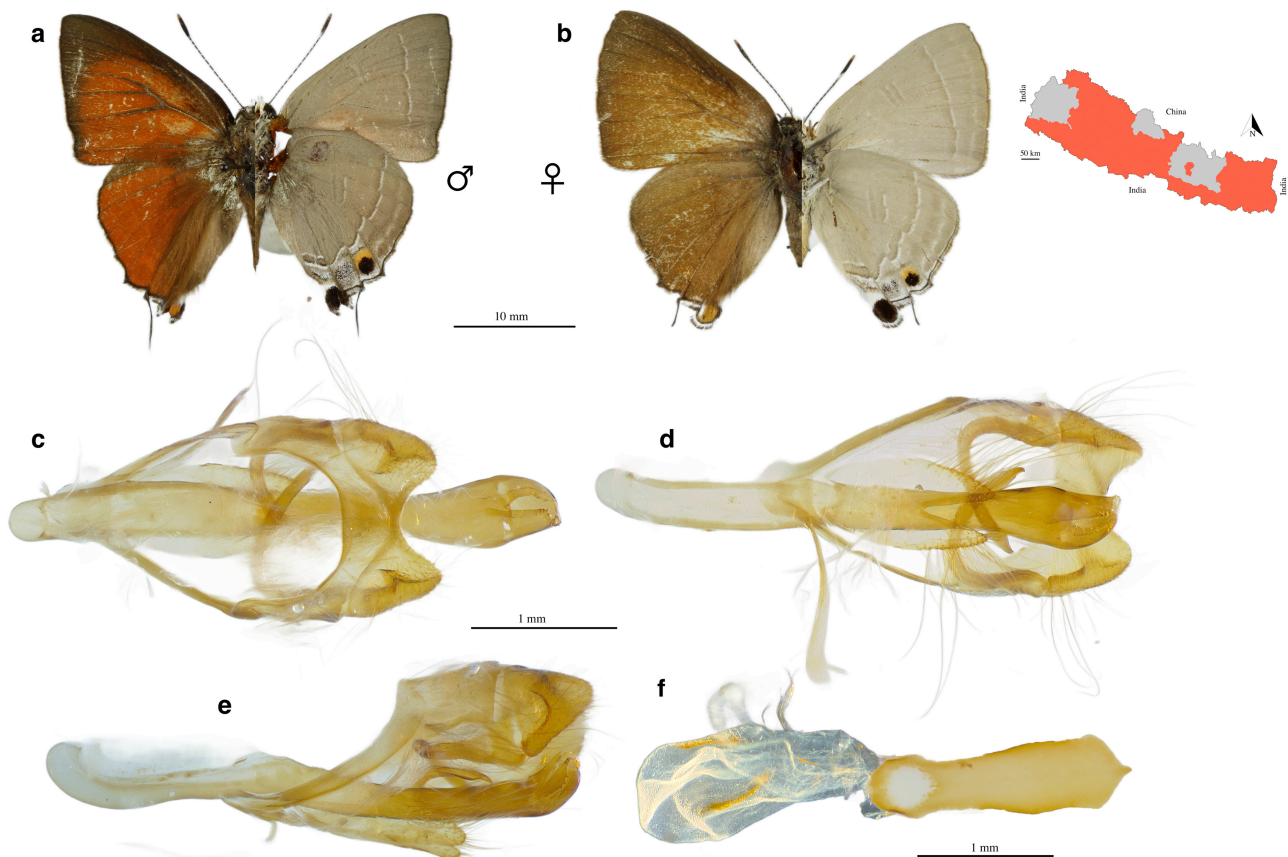


FIGURE 3. *Rapala iarbus iarbus* (Fabricius, 1787), with distribution map indicating confirmed occurrences (red) and areas lacking records (gray) in Nepal. a. Male spread specimen from Khasi Hills, India; b. Female spread specimen from Darjeeling, India; c. Male genitalia dorsal view; d. Male genitalia ventral view; e. Male genitalia lateral view; f. Female genitalia, ductus and corpus bursae.

Biology: Larvae are known to feed on the young leaves of *Melastoma polyanthum* Burm.f., *Nephelium lappaceum* L., *Xylia xylocarpa* (Roxb.) W.Theob. (Fleming 1975; Ek-Amnuay 2012), *Ougeinia dalbergioides* Benth., *Melastoma malabathricum* L., *Zizyphus rugosa* Lam. (Kehimkar 2008), *Desmodium oojeinense* (Roxb.) H.Ohashi, *Mangifera indica* L., and *Mimusops elengi* L. (Robinson *et al.* 2023).

Natural History: Adults are typically found in wooded areas and on flowers (Van der Poel & Smetacek 2022).

Variation: Variation occurs primarily in the ventral ground color, ranging from ash gray to slate gray.

Phenology in Nepal: March, May to December (Van der Poel & Smetacek 2022).

Elevation: 180–1,490 m (Smith 1994; Van der Poel & Smetacek 2022).

Distribution on the Indian Subcontinent: Nepal to northeastern India, Bhutan, and Bangladesh (Van Gasse 2018).

Distribution in Nepal: Terai region, Karnali Province, Kathmandu Valley, Gandaki Province including the Pokhara Valley, and Koshi Province (Van der Poel & Smetacek 2022).

3. *R. selira* (Moore, 1874) Figs 1c, 4

Deudorix selira Moore, 1874: 272

Type Locality: Bashahr (India)

Common Name: Himalayan Red Flash

Material Examined: **NEPAL. Karnali Province. Humla.** Bargaon, 20.v.1985, 2805 m, leg. C.P. Smith (ANHM, 1♂); same locality, 23.v.1985, leg. C.P. Smith (ANHM, 1♂). **INDIA. Himachal Pradesh.** San Damiano [sic], Shimla Hills, June, 2285 m, MGCL 1201223, Genitalic Vial KW-24-92 (MGCL, 1♂) (Fig. 4a); Shimla, Mashobra, 2410 m, 25/4, MGCL 1201222, Genitalic Vial KW-24-86 (MGCL, 1♀) (Fig. 4b).

Wingspan: 32–34 mm (Van der Poel & Smetacek 2022).

Diagnosis (Figs 4a, 4b): *Rapala selira* can be distinguished from congeners in Nepal by the orange patches on the discal area of the dorsal forewing and the marginal area of the dorsal hindwing, resembling the females of *Heliophorus* Geyer, 1832 species. Ventrally, it resembles *R. iarbus* but can be differentiated by its ochraceous background and the straight, non-lunulate margins of the postdiscal bands. It also resembles *R. nissa* and *R. huangi* on the ventral side but typically has much wider bands with more distinct white edging. Males have smaller orange patches, whereas females have broader ones dorsally.

Male Genitalia (Figs 4c–4e): Aedeagus vesica with a pair of strongly sclerotized thick cornuti; distal margin of vesica normal with minute spines; valvae wide, narrowed at the apices; cleft between the valvae slightly less than half the length of the valval plate.

Female Genitalia (Fig. 4f): Anterior apophysis short; ductus bursae wide with lateral margins straight, distal end wider with convex margin; corpus bursae large and bulbous in situ (punctured in Fig. 4f), with a longitudinal slender signum on either side with rows of strong spines inside.

Biology: Larvae are believed to feed on the flowers of *Indigofera atropurpurea* Buch.-Ham. ex Hornem. (Wynter-Blyth 1957).

Natural History: Adults are typically found in open areas, woodlands, and flowers (Van der Poel & Smetacek 2022).

Variation: Variation occurs primarily in the ventral postdiscal bands, ranging from wide to narrow. See Kumar (2013) for variation in genitalia.

Phenology in Nepal: April to August (Van der Poel & Smetacek 2022).

Elevation: 2,070–3,660 m (Smith 1994; Van der Poel & Smetacek 2022).

Distribution on the Indian Subcontinent: Pakistan, northwestern India to central Nepal, and Bhutan (needs confirmation) (Van Gasse 2018).

Distribution in Nepal: Sudurpaschim Province (excluding the Terai districts), Karnali Province, and Manang and Mustang districts (Van der Poel & Smetacek 2022).

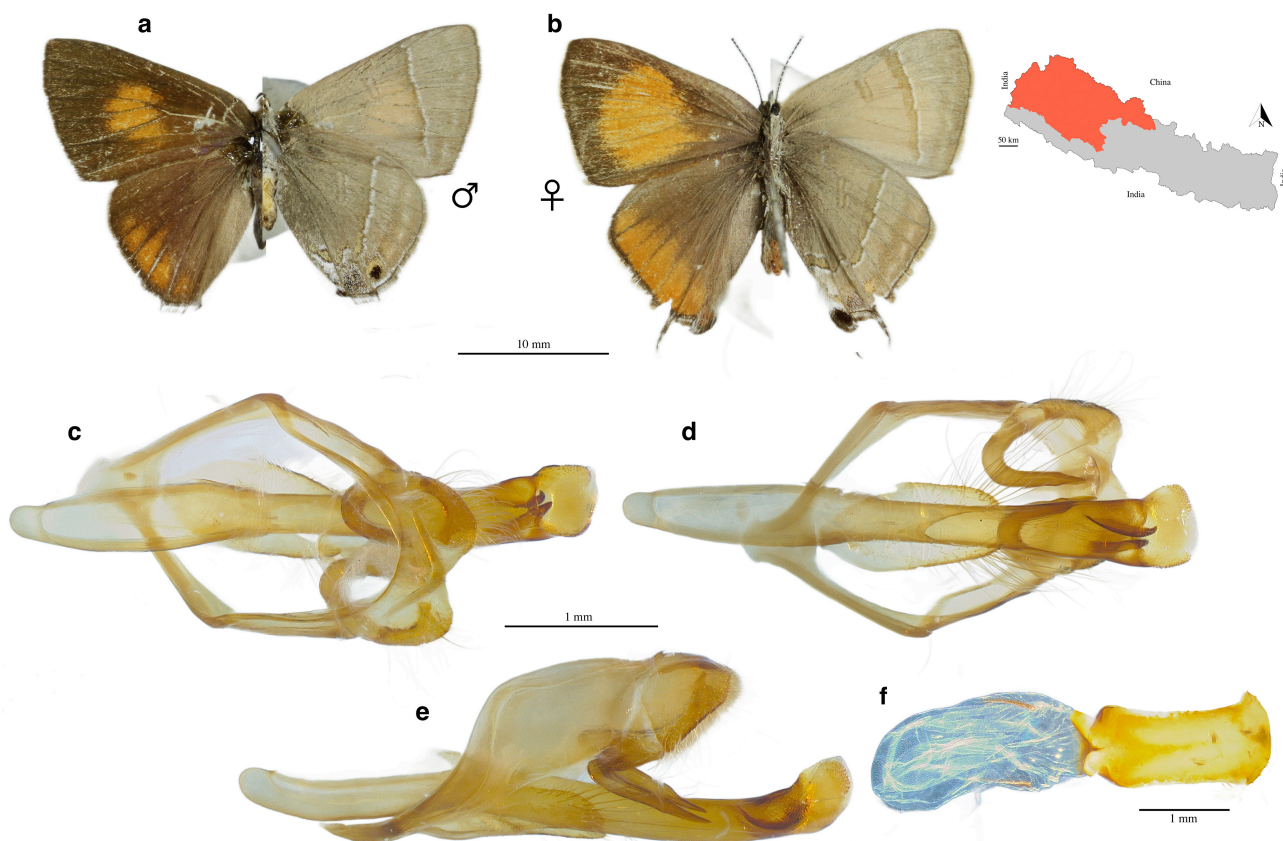


FIGURE 4. *Rapala selira* (Moore, 1874), with distribution map indicating confirmed occurrences (red) and areas lacking records (gray) in Nepal. a. Male spread specimen from Shimla, India; b. Female spread specimen from Shimla, India; c. Male genitalia dorsal view; d. Male genitalia ventral view; e. Male genitalia lateral view; f. Female genitalia, ductus and corpus bursae.

4. *R. manea schistacea* (Moore, 1879) Figs 1d, 5

Deudorix manea schistacea Moore, 1879: 140

Type Locality: Kolkata (India)

Common Name: Slate Flash

Material Examined: **NEPAL. Gandaki Province. Kaski.** Rupatal, 24.v.1986, 675 m, leg. C.P. Smith (ANHM, 1♂). **Gorkha.** Koplang Khola, 6.iv.1970, 645 m, leg. C.P. Smith (ANHM, 1♂); **Bagmati Province. Bhaktapur.** Suryabinayak, 23.iv.1986, 1590 m, leg. C.P. Smith (ANHM, 1♀). **INDIA. Meghalaya.** Khasi Hills, leg. Le Moul, MGCL 1201225, Genitalic Vial KW-24-87 (MGCL, 1♂) (Fig. 5a); same data, MGCL 1201224, Genitalic Vial KW-24-105 (MGCL, 1♀) (Fig. 5b).

Wingspan: 30–33 mm (Van der Poel & Smetacek 2022).

Diagnosis (Figs 5a, 5b): *Rapala manea* can be distinguished from its congeners by its broad postdiscal bands, which are edged in white more strongly on the outer margin, and its ventral coloration, which varies from slate gray to yellowish or purplish. It can be differentiated from the similar-looking *R. scintilla* by the blue iridescence present on both the dorsal fore- and hindwings of males, as well as by its ventral side, which lacks a greenish tinge and often features more prominent submarginal spots on the hindwing. In contrast, *R. scintilla* males have a blue iridescence only on the dorsal hindwings, a ventral side with a greenish tinge, and less distinct submarginal spots. Identification often requires viewing the dorsal side of the male wings. *Rapala varuna* may occasionally appear similar but can be distinguished by its wider bands, a cell-end bar that is connected to or very close to the postdiscal band on the ventral hindwing, and a postdiscal spot 7 on the ventral hindwing that is not smaller than spot 6. Males are iridescent blue on both wings dorsally while females are dull purplish blue.

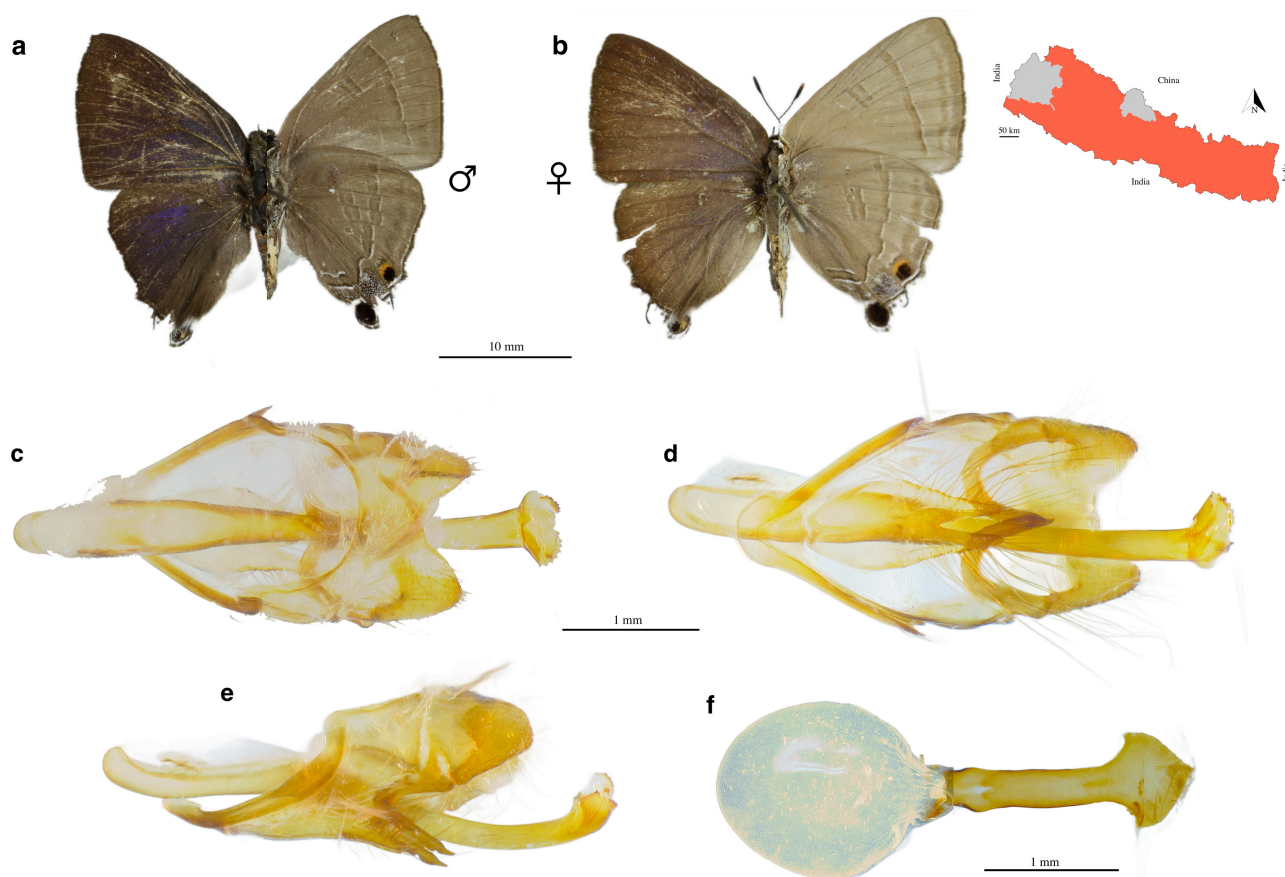


FIGURE 5. *Rapala manea schistacea* (Moore, 1879), with distribution map indicating confirmed occurrences (red) and areas lacking records (gray) in Nepal. a. Male spread specimen from Khasi Hills, India; b. Female spread specimen from Khasi Hills, India; c. Male genitalia dorsal view; d. Male genitalia ventral view; e. Male genitalia lateral view; f. Female genitalia, ductus and corpus bursae.

Male Genitalia (Figs 5c–5e): Aedeagus vesica with a slight longitudinal central cleft and serrated distal margin on either side; valvae short and slender with blunt apices, wider bases and narrowed apices; cleft between the valvae about 1/3rd the length of the valval plate.

Female Genitalia (Fig. 5f): Anterior apophysis moderately long; ductus bursae slender and elongated, lateral margins about straight, distal end wide, triangular, and arrow shaped; corpus bursae round and bulbous without any visible signum.

Biology: This species is among the most polyphagous butterflies known. The larvae are known to feed on the flowers or young leaves of *Senegalia caesia* (L.) Maslin, Seigler & Ebinger, *S. megaladena* (Desv.) Maslin, Seigler & Ebinger, *S. pennata* (L.) Maslin, *S. torta* (Roxb.) Maslin, Seigler & Ebinger, *Antidesma acidum* Retz., *A. ghaesembilla* Gaertn., *Camellia sinensis* (L.) Kuntze, *Combretum indicum* (L.) De Filippis, *Sorbaria sorbifolia* (L.) A. Braun, and *Ziziphus* Mill. spp. (Wynter-Blyth 1957); *Averrhoa bilimbi* L., *Clerodendrum infortunatum* L., *Lantana camara* L., *Mimosa diplotricha* C. Wright, *Saraca asoca* (Roxb.) W.J. de Wilde, *Urena lobata* L., *Lepisanthes tetraphylla* (Vahl) Radlk. (Nitin *et al.* 2018); *Ixora* L. sp. (Kunte *et al.* 2025); *Litchi chinensis* Sonn. (Mukherjee 2021); *Mangifera indica* L., *Lithocarpus quercifolius* C.C. Huang & Y.T. Chang, *Millettia nitida* Benth. (Robinson *et al.* 2023); *Senna tora* (L.) Roxb. (Naik & Mustak 2020); *Syzygium* Gaertn. sp. (Bhakare & Ogale 2018); and *Mallotus repandus* (Rottler) Müll. Arg. (Banerjee *et al.* 2023). Additionally, they have been recorded on flowers and young leaves of *Bauhinia purpurea* L., *Dimocarpus longan* Lour., *Durio zibethinus* Murray, *Gordonia axillaris* Szyszyl., *Nephelium lappaceum* L., *Combretum indicum* (L.) De Filippis, and *Viburnum odoratissimum* Ker Gawl. (Ek-Amnuay 2012); and on the flowers of *Spondias pinnata* (L. fil.) Kurz (Mukherjee 2022); *Calliandra haematocephala* Hassk. (Mukherjee 2021); *Mimosa invisa* Mart. ex Colla (Kalawate *et al.* 2024); and *Caesalpinia bonduc* (L.) Roxb. (Payra & Bhatt 2024). Their host range is likely broader, encompassing additional plant species.

Natural History: Adults are typically found in woods, along forest trails, on flowers, and near stream edges (Sondhi *et al.* 2013, Van der Poel & Smetacek 2022).

Variation: The ventral coloration of *Rapala manea* varies from slate gray to yellowish or purplish. The cell-end bar on the ventral hindwing can range from distant to close to the postdiscal band. The spots in the postdiscal bands may be aligned or strongly broken.

Elevation: 150–2,140 m (Smith 1994; Van der Poel & Smetacek 2022).

Phenology in Nepal: March to December (Van der Poel & Smetacek 2022).

Distribution on the Indian Subcontinent: Pakistan, Sri Lanka, India, including the Andamans, Nepal, Bhutan, and Bangladesh (Van Gasse 2018).

Distribution in Nepal: Widely distributed across Nepal, except in arid regions such as much of Sudurpaschim Province and the trans-Himalayan districts of Manang and Mustang (Van der Poel & Smetacek 2022).

5. *R. scintilla scintilla* de Nicéville, 1890 Figs 1e, 6

Rapala scintilla de Nicéville, 1890: 461

Type Locality: Sikkim (India)

Common Name: Scarce Slate Flash

Material Examined: **NEPAL. Bagmati Province. Makawanpur.** Kahare Khola, 20.i.1991, 215 m, leg. C.P. Smith (ANHM, 1♂). **Gandaki Province. Gorkha.** Luitel School, 5.xii.1968, 885 m, leg. C.P. Smith (ANHM, 1♂). **MALAYSIA. Pahang.** Genting Sempah Pass?, 1.i.1972, MGCL 1201235, Genitalic Vial KW-24-94 (MGCL, 1♂) (Fig. 6a); Fraser's Hill, 13.vi.1968, MGCL 1201236, Genitalic Vial KW-24-110 (MGCL, 1♀) (Fig. 6b); same data, MGCL 1026504, Genitalic Vial KW-24-115 (MGCL, 1♀).

Wingspan: 30–32 mm (Van der Poel & Smetacek 2022).

Diagnosis (Figs 6a, 6b): *Rapala scintilla* can be distinguished from the similar-looking *R. manea* by the distribution of blue iridescence in males; in *R. scintilla*, it is present exclusively on the hindwings when viewed under sidelight, whereas in *R. manea*, it appears on both wings under the same conditions. Dorsally, the wings of *R. scintilla* are steely blue, while ventrally, males exhibit a grayer hue with a subtle greenish tinge. The submarginal spots on the hindwings of *R. scintilla* are either suffused or faded, whereas in *R. manea*, these spots are often more pronounced and distinct. Females of *R. scintilla* are dull blue dorsally and ochraceous ventrally.

Male Genitalia (Figs 6c–6e): Aedeagus vesica with deep longitudinal cleft in the middle with either side serrated; valvae short and slender with blunt apices; cleft between the valvae about 1/3rd the length of the valval plate.

Female Genitalia (Fig. 6f): Anterior apophysis short and blunt; ductus bursae distal end wide, triangular, and arrow shaped as in *R. manea*; however, the lateral margins of the arrowhead are distinctly more pointed than in *R. manea*; corpus bursae with small, short signum on either side with minute spines inside; large brown signum-like patch on the illustrated genitalia is a defect.

Biology: The larvae are known to feed on the young leaves of *Butea frondosa* Koen. ex Roxb and *Ziziphus mauritiana* Lam. (Ek-Amnuay 2012).

Natural History: Adults are typically found in wooded areas and are often observed on flowers (Van der Poel & Smetacek 2022).

Variation: Some specimens may not exhibit the greenish tinge on the ventral wings as clearly.

Phenology in Nepal: January, February, April, May, July, October to December (Van der Poel & Smetacek 2022). It is potentially present year-round but is often mistaken for *R. manea*.

Elevation: 180–1,980 m (Smith 1994; Van der Poel & Smetacek 2022).

Distribution on the Indian Subcontinent: Central Nepal east to northeastern India, potentially Bhutan, and northeastern Bangladesh (Van Gasse 2018).

Distribution in Nepal: Terai region, Gandaki Province including the Pokhara Valley, Bagmati Province including the Kathmandu Valley, and Koshi Province (Van der Poel & Smetacek 2022).

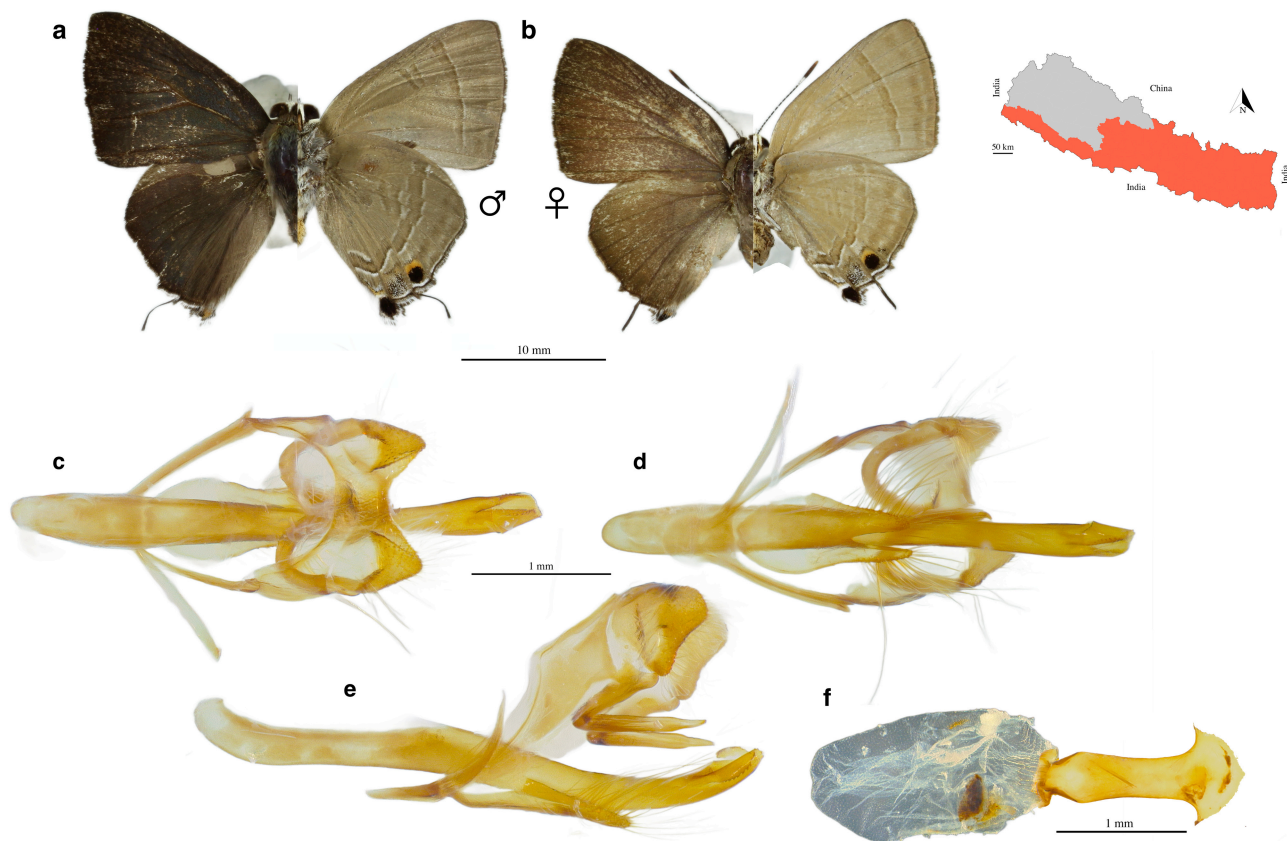


FIGURE 6. *Rapala scintilla scintilla* de Nicéville, 1890, with distribution map indicating confirmed occurrences (red) and areas lacking records (gray) in Nepal. a. Male spread specimen from Pahang, Malaysia; b. Female spread specimen from Pahang, Malaysia; c. Male genitalia dorsal view; d. Male genitalia ventral view; e. Male genitalia lateral view; f. Female genitalia, ductus and corpus bursae.

6. *R. rectivitta* (Moore, 1879) Figs 1f, 7

Deudorix rectivitta Moore, 1879: 141

Type locality: N. Cachar (India)

Common Name: Shot Flash

Taxonomic Note: *Rapala rectivitta* was treated as a senior synonym of *R. buxaria* by Swinhoe (1897) and has been regarded as such by subsequent literature such as Cantlie (1959, 1962) and Van Gasse (2018). However, Varshney & Smetacek (2015) listed them as separate species. Based on their original descriptions and Swinhoe (1897), we reaffirm that the two species are synonymous.

Material Examined: **INDIA. Nagaland.** Naga Hills, Jafwo [sic: recte Japfü] Range, viii.1953, 1830–2745 m, MGCL 1201229, Genitalic Vial KW-24-89 (MGCL, 1♂) (Fig. 7a).

Wingspan: 30–35 mm (Ek-Amnuay 2012).

Diagnosis (Figs 7a): *Rapala rectivitta* can be distinguished from the similar-looking *R. nissa*, particularly by the dorsal view of the males. Males of *R. rectivitta* exhibit a deep blue color whose iridescence persists even when viewed at around 180° whereas those of *R. nissa* display a purplish-blue color whose iridescence vanishes when viewed at around 180°. Additionally, *R. nissa* typically displays an orange patch on the dorsal wing, a feature absent in *R. rectivitta*. The ventral discal band of *R. rectivitta* has bronze color at the center similar to that in *R. nissa* but is often darker and smoother overall, less edged in white than in brown; the ventral color varies from brown to purplish. Females of *R. rectivitta* are paler blue on the dorsal side.

Male Genitalia (Figs 7b–7d): Aedeagus vesica with a serrated distal margin that sticks out on one side; valvae short and wide with blunt apices; cleft between the valvae less than half the length of the valval plate. The genitalia and the specimen illustrated in Huang (2003) belong to *R. huangi*, not *R. rectivitta*.

Biology: Not known.

Natural History: Adults are typically observed near woods.

Variation: Variation mostly occurs in the width of the postdiscal bands, which can range from wide, resembling double bands, to narrow, resembling a single band. The color of the postdiscal band may vary from dark brown to light brown.

Phenology in Nepal: March and June.

Elevation: 800–1000 m.

Distribution in Nepal: Pokhara Valley, potentially widespread but confused with *R. nissa*.

Distribution on the Indian Subcontinent: Nepal, northeastern India, and Bhutan (Van Gasse 2018).

Remarks: Most records of *R. rectivitta* from Nepal, cited in Smith (1994, 2006, 2011a, 2011b) and later by Van der Poel & Smetacek (2022), refer to either *R. rosacea*, *R. nissa*, or *R. huangi*. In fact, none of the studied specimens from Nepal labeled *R. rectivitta* represented *R. rectivitta*. The only confirmed records to date are by Albert Vliegenthart (Fig. 1f) and the first author, with photographs taken in Pokhara, Nepal, in March and June, respectively, at elevations between 800 and 1,000 m. There may be additional records from Nepal that are unknown to us.

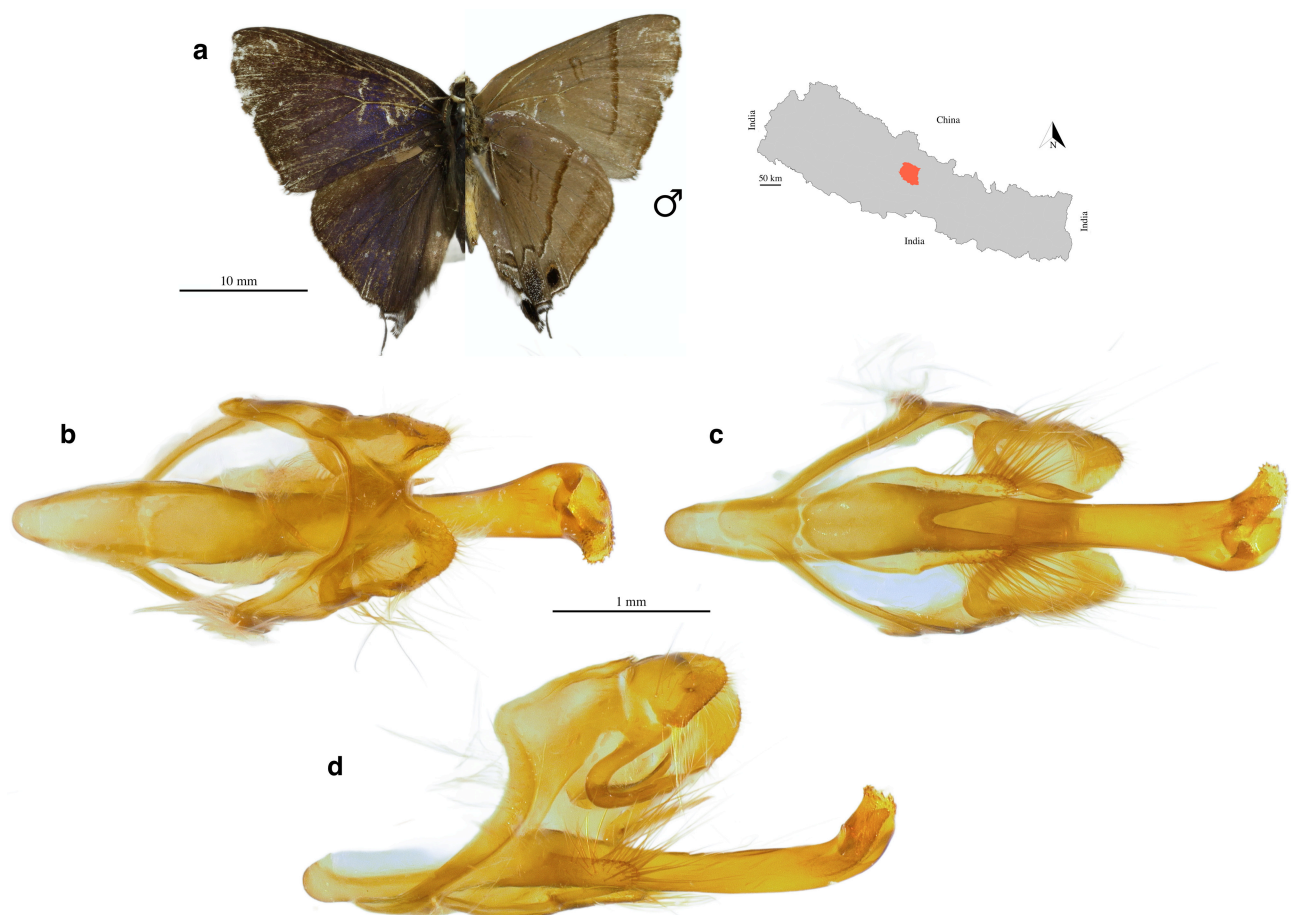


FIGURE 7. *Rapala rectivitta* (Moore, 1879), with distribution map indicating confirmed occurrences (red) and areas lacking records (gray) in Nepal. a. Male spread specimen from Naga Hills, India; b. Male genitalia dorsal view; c. Male genitalia ventral view; d. Male genitalia lateral view.

7. *R. nissa nissa* (Kollar, [1844]) Figs 1g, 8

Thecla nissa Kollar, [1844]: 412

Type locality: Mussoorie (India)

Common Name: Common Flash

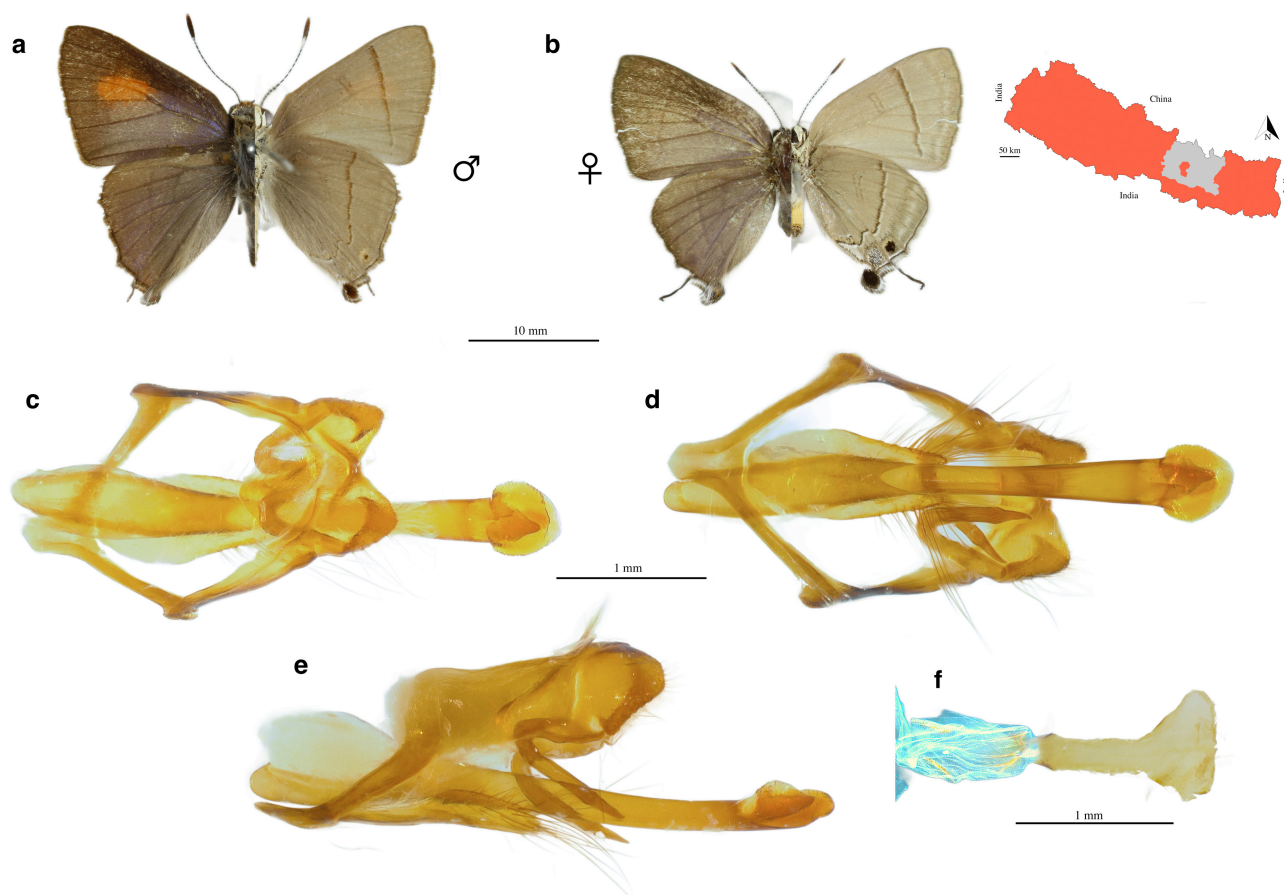


FIGURE 8. *Rapala nissa nissa* (Kollar, [1844]), with distribution map indicating confirmed occurrences (red) and areas lacking records (gray) in Nepal. a. Male spread specimen from Uttarakhand, India; b. Female spread specimen from Uttarakhand, India; c. Male genitalia dorsal view; d. Male genitalia ventral view; e. Male genitalia lateral view; f. Female genitalia, ductus and corpus bursae.

Taxonomic Note: *Rapala nissa* from Nepal was recently split into two species, *R. nissa* and *R. huangi* Nakamura & Seki, 2017, based on genitalia analysis and sympatry, suggesting they are widely distributed in the Himalayas, also occurring together (Nakamura & Seki 2017, 2019). Consequently, the distributions of *R. nissa*, *R. huangi*, and *R. reactivitta* are now intermixed, as they cannot always be reliably distinguished from photographs alone. Additionally, Nakamura & Seki (2017) synonymized *R. nissa ranta* Swinhoe, 1897, with the nominotypical subspecies, indicating that *R. nissa* is monotypic throughout the Himalayas.

Material Examined: **NEPAL. Bagmati Province. Lalitpur.** Godavari Garden, 26.iii.1970, 1495 m, leg. C.P. Smith (ANHM, 1♂). **Bhaktapur.** Bhadgaon, 12.v.1973, 1530 m, leg. C.P. Smith (ANHM, 1♂). **Gandaki Province. Baglung.** Beni, 23.vi.1974, 855 m, leg. C.P. Smith (ANHM, 1♂). **Manang.** Marshyandi River, 11.viii.1986, 2440 m, leg. C.P. Smith (ANHM, 1♀). **Kaski.** Pokhara, Kali Khola, 7.xi.1974, 1160 m, leg. C.P. Smith (SNHM, 1♂). **INDIA. Meghalaya.** Khasi Hills, MGCL 1201226, Genitalic Vial KW-24-107 (MGCL, 1♀). **Uttarakhand.** Mussoorie, 21.iii.1917, 1680 m, leg. O.C. Ollenbach, MGCL 1206507, Genitalic Vial KW-24-117 (MGCL, 1♂) (Fig. 8a); Mussoorie, 27.v.1912, leg. H.D. Peile, MGCL 1199852, Genitalic Vial KW-24-99 (MGCL, 1♀) (Fig. 8b).

Wingspan: 34–38 mm (Van der Poel & Smetacek 2022).

Diagnosis (Figs 8a, 8b): *Rapala nissa* can be distinguished from the similar-looking *R. reactivitta* by the dorsal view of the males which are purplish-blue and not iridescent when viewed at around 180° while those of *R. reactivitta* are deep iridescent blue even when viewed at around 180°. Likewise, *R. nissa* often has an orange patch on the dorsal wing which is lacking in *R. reactivitta*. Ventrally, the bands are lighter, often more broken, and whiter edged than in *R. reactivitta*. *Rapala nissa* closely resembles *R. huangi* but can be distinguished by the postdiscal line on the ventral forewing, which is mostly straight or curved inward, whereas it is mostly curved outward in *R. huangi*. A more reliable identification requires genitalia examination as variation exists. Discal band often has bronze color in

the center; underside is variable from brown to purplish with postdiscal bands ranging from wide to narrow. Female is pale blue above.

Male Genitalia (Figs 8c–8e): Aedeagus with a flat vesica that lacks serrations or claw-like cornuti; valvae short and slender with narrowed apices; cleft between the valvae less than 1/3rd the length of the valval plate.

Female Genitalia (Fig. 8f): Anterior apophysis short, apically blunt; ductus bursae distal end much wider than the slender proximal portion, shaped as an anvil; corpus bursae with a longitudinal signum on either side featuring rows of strong spines inside.

Biology: The larvae are known to feed on the flowers of *Rosa* spp. (Kehimkar 2008), *Malus domestica* (Suckow) Borkh. (Robinson *et al.* 2023), and possibly on the flowers of *Astilbe rivularis* Buch.-Ham. ex D.Don (Wynter-Blyth 1957). Potential oviposition has been observed on *Rubus ellipticus* Sm. and on an unknown fern species by the first author in central Nepal.

Natural History: Adults are typically found in open landscapes, woodlands, and on flowers (Van der Poel & Smetacek 2022).

Variation: Variation primarily occurs in the width of the postdiscal bands, which can range from wide, resembling double bands, to narrow, appearing as a single band, thereby aligning with both the *varuna* and *pheretima* groups. The color of the ventral wings may range from brown to purplish. The postdiscal bands on the ventral forewing may occasionally curve outward, as seen in *R. huangi*.

Phenology in Nepal: January to December (Van der Poel & Smetacek 2022).

Elevation: 670–3,000 m (Smith 1994; Van der Poel & Smetacek 2022).

Distribution on the Indian Subcontinent: Pakistan, northwestern and northeastern India, Nepal, and Bhutan (Van Gasse 2018).

Distribution in Nepal: Throughout Nepal, except for Bagmati Province (excluding the Kathmandu Valley) (Van der Poel & Smetacek 2022) but doubtless present.

***R. hinomaru* Fujioka, 1970 syn. nov. *R. nissa* (Kollar, [1844]) Fig. 9**

Rapala hinomaru Fujioka, 1970: 29

Type Locality: Dhankuta, Nepal

Taxonomic Note: *Rapala hinomaru* Fujioka, 1970, was described from a single female specimen collected in 1963 from Dhankuta, Nepal. Although Fujioka (1970) stated that the holotype was deposited at the National Science Museum of Japan (now the National Museum of Nature and Science, Taitō, Japan), it is actually housed at CUBM. In this study, the holotype was examined using color images of its dorsal and ventral sides provided by CUBM.

Based on images of the holotype (Fig. 9), the specimen is undoubtedly conspecific with the *R. nissa* complex. Fujioka (1970) distinguished *R. hinomaru* from *R. nissa* primarily by the narrower wing margins toward the apex (a character not present in the holotype), a prominent but irregular white discal line on the ventral hindwing, and significantly longer tails. However, these characters are also observed in individuals of *R. nissa*, a species which exhibits considerable morphological variation.

It does not correspond to *R. rectivitta*, which is characterized by straighter and often darker postdiscal bands (Wynter-Blyth 1957). The primary question remains whether *R. hinomaru* corresponds to *R. nissa* or *R. huangi*. Fujioka's (1970) specimen closely resembles the holotype of *R. nissa* (see Nakamura & Seki 2017 p. 76 Fig. 2B) and the *R. nissa* individual depicted in this study (Fig. 8b). Although *R. nissa* and *R. huangi* cannot always be reliably distinguished without genitalia examination, the discal band on the ventral forewing serves as an important diagnostic character (Nakamura & Seki 2019). The images labeled as *R. nissa* in Fujioka (1970) (p. 85, Pl. 11, Figs. 3, 4) are more accurately attributable to *R. huangi*, based on the outwardly curved postdiscal bands on the ventral forewings. In contrast, the holotype of *R. hinomaru* (p. 85, Pl. 11, Figs. 5, 6) is most likely *R. nissa*. Thus, Fujioka (1970) appears to have misidentified these two sympatric species from Nepal (pers. comm. Nakamura 2025). Based on this, we herein propose treating *R. hinomaru* as a junior subjective synonym of *R. nissa*, **syn. nov.** This revision contributes to the stabilization of the taxonomic framework of the *Rapala* genus in Nepal.

Type Material Examined: Holotype ♀: **Nepal. Koshi Province. Dhankuta.** Darapani–The Tombol Bridge, 25.vi.1963, 1000 m, leg. T. Fujioka, in CUBM (Fig. 9).

Wingspan: 31 mm.

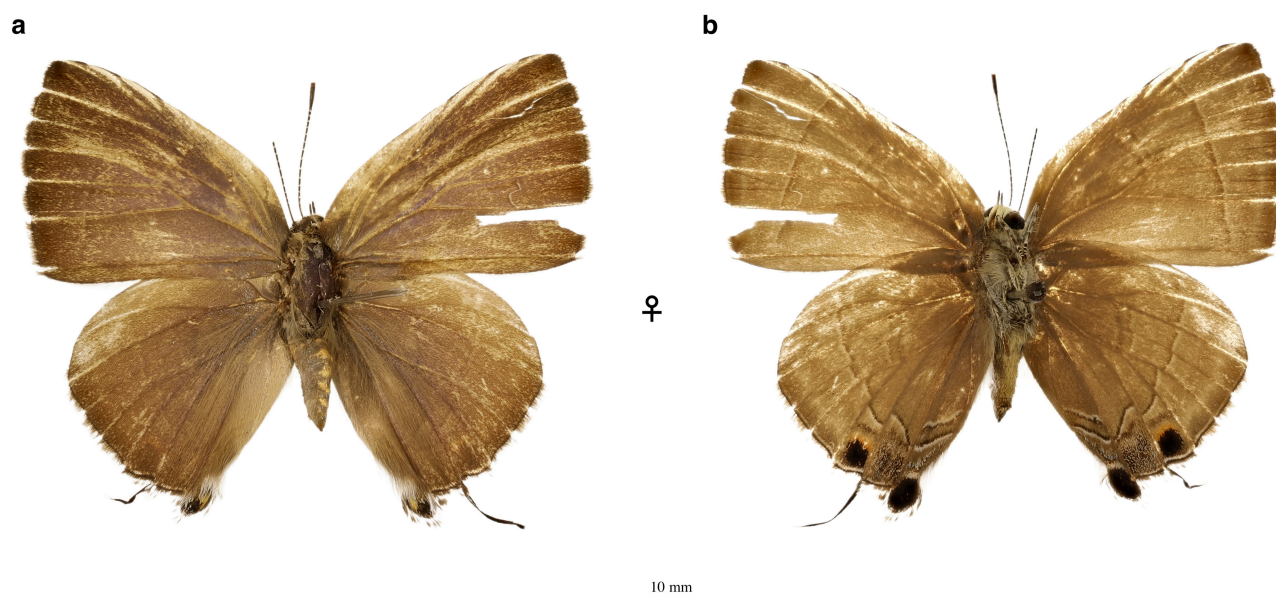


FIGURE 9. *Rapala hinomaru* Fujioka, 1970, **syn. nov.** a. Holotype ♀ spread specimen dorsal view; b. Same specimen, ventral view. Images © CUBM.

8. *R. huangi* Nakamura & Seki, 2017 Figs 1h, 10

Rapala huangi Nakamura & Seki, 2017: 7

Type locality: Godavari (Nepal)

Proposed Common Name: Round-banded Flash

Material Examined: **INDIA. Meghalaya.** Shillong, 4.iii.1945, leg. R.E. Parsons, MGCL 1201227, Genitalic Vial KW-24-88 (MGCL, 1♂); Khasi Hills, vi.1893, MGCL 1201840, Genitalic Vial KW-24-95 (MGCL, 1♂) (Fig. 10a); same data, MGCL 1201841, Genitalic Vial KW-24-96 (MGCL, 1♀) (Fig. 10b); same locality, v.1986 (MGCL, 1♂); same locality, 1967 (MGCL, 1♂); Cherrapunji, 10.iv.1942, leg. R.E. Parsons (MGCL, 1♀). **Uttarakhand.** Nainital (Kumaon), Bhimtal, 24.iii.1983, leg. F. Smetacek (MGCL, 1♂).

Wingspan: 32–39 mm (Nakamura & Seki 2017).

Diagnosis (Figs 10a, 10b): *Rapala huangi* can be distinguished from the similar-looking *R. nissa* by the ventral postdiscal band on the forewing, which is noticeably curved outward rather than curved inward or straight. However, accurate identification requires a genitalia analysis, where the aedeagus bears a vesica laterally extending on both sides and sclerotized cornuti shaped like a pair of sharp claws, similar to those in *R. selira* but much thinner (Nakamura & Seki 2017). In females, the distal end of the ductus bursae is only slightly wider than the proximal part (Nakamura & Seki 2019).

Male Genitalia (Figs 10c–10e): Aedeagus with a rounded vesica that extends to both sides and has minute serrations laterally; a pair of sclerotized cornuti as in *R. selira* but much thinner; valvae short and slender with narrowed apices; cleft between the valvae about 1/3rd the length of the valval plate.

Female Genitalia (Fig. 10f): Anterior apophysis short; ductus bursae distal portion not as enlarged than the proximal portion as in *R. nissa* and has a slightly convex outer margin; corpus bursae with a longitudinal signum on either side featuring rows of strong spines inside.

Biology: Potentially similar to *R. nissa*.

Natural History: Similar to *R. nissa*.

Variation: Variation mostly occurs in the width of the postdiscal bands, which can range from wide, resembling double bands, to narrow, resembling a single band. The color of the ventral wings may range from brown to purplish.

Phenology in Nepal: April to July (personal observations; Nakamura & Seki 2017, 2019).

Elevation: ca. 1000–2000 m (Nakamura & Seki 2017, 2019).

Distribution on the Indian Subcontinent: Northwestern and northeastern India, Nepal, potentially Bhutan.

Distribution in Nepal: Recorded from Dadeldhura, Kaski, Lalitpur, and Makawanpur districts (Nakamura & Seki 2017). Potentially sympatric with *R. nissa* across its distribution range.

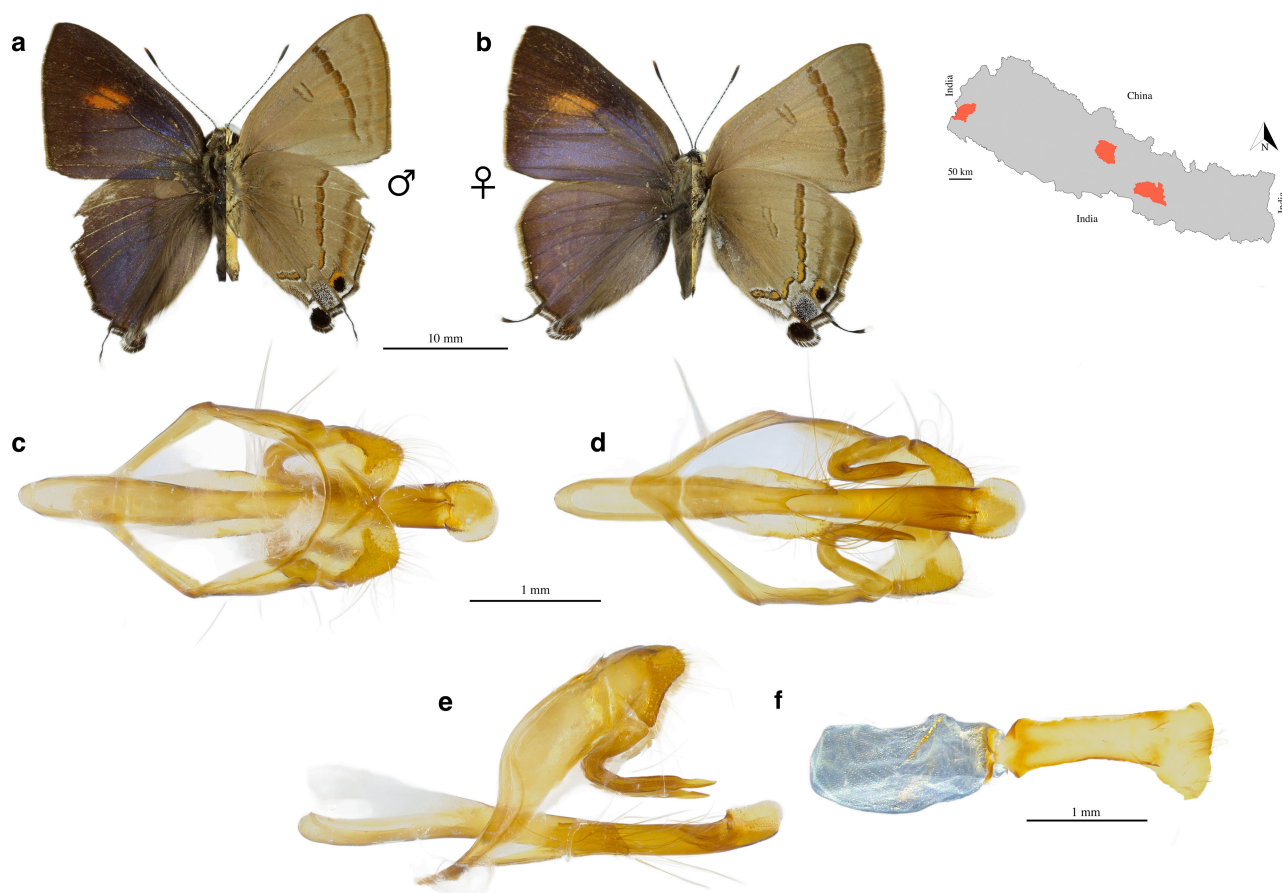


FIGURE 10. *Rapala huangi* Nakamura & Seki, 2017, with distribution map indicating confirmed occurrences (red) and areas lacking records (gray) in Nepal. a. Male spread specimen from Khasi Hills, India; b. Female spread specimen from Khasi Hills, India; c. Male genitalia dorsal view; d. Male genitalia ventral view; e. Male genitalia lateral view; f. Female genitalia, ductus and corpus bursae.

9. *R. pheretima petosiris* (Hewitson, 1863) Figs 1i, 11

Deudorix petosiris Hewitson, 1863: 22

Type locality: East India

Common Name: Copper Flash

Material Examined: **NEPAL. Bagmati Province. Chitwan.** Mahendra Forest, 21.iv.1987, 200 m, leg. C.P. Smith (ANHM, 1♀). **Gandaki Province. Gorkha.** Luitel School, 3.xii.1968, 885 m, leg. C.P. Smith (ANHM, 2♂). **Kaski.** Phewatal, 29.xi.1986, 1070 m, leg. C.P. Smith (ANHM, 1♀). **INDIA. Meghalaya.** Khasi Hills, 21.ii.1993, MGCL 1201220, Genitalic Vial KW-24-85 (MGCL 1♂) (Fig. 11a); Khasi Hills, 1950, MGCL 1201221, Genitalic Vial KW-24-104 (MGCL 1♀) (Fig. 11b).

Wingspan: 36–42 mm (Van der Poel & Smetacek 2022).

Diagnosis (Figs 11a, 11b): Dorsally, the male *R. pheretima* resembles *R. iarbus* but can be distinguished by the shape of vein 2 on the hindwing, which lacks the stubby tail present in *R. iarbus*. The dorsal orange on the forewing is more suffused in male *R. pheretima* than in male *R. iarbus*. Ventrally, *R. pheretima* can be identified by its coppery hue, narrow dark brown postdiscal bands, a dark forewing cell-end bar, and typically a central cell bar on the forewing. Males also usually have a sub basal spot in space 7 on ventral hindwing. The male is red above, while the female is purple blue.

Male Genitalia (Figs 11c–11f): Aedeagus vesica with a hook-shaped tip; valvae short and slender with narrowed apices; cleft between the valvae slightly more than 1/3rd the length of the valval plate.

Female Genitalia (Fig. 11g): Anterior apophysis extremely short; ductus bursae lateral margins straight, distal end enlarged and smoothly convex; corpus bursae round and bulbous with a yolk-like center, short signum on either side with a single large hook-shaped spine inside.

Biology: Larvae are known to feed on the flowers of *Dimocarpus longan* Lour., *Syzygium fruticosum* (Roxb.) DC., *Lepisanthes rubiginosa* (Roxb.) Leenh., *Litchi chinensis* Sonn., *Mangifera indica* L., *Nephelium lappaceum* L., *Vigna unguiculata unguiculata* (L.) Walp., 1842 (Ek-Amnuay 2012), *Aganope thyrsiflora* (Benth.) Polhill, and *Macadamia integrifolia* Maiden & Betcher (Robinson *et al.* 2023).

Natural History: Adults are typically found in forests, forest edges, stream edges, woodlands, and flowers (Sondhi *et al.* 2013; Van der Poel & Smetacek 2022).

Variation: The postdiscal bands in some individuals may be wider. Variation primarily occurs in the presence or absence of the mid-cell band on the ventral forewing and, in males, the sub basal spot 7 on the ventral hindwing.

Phenology in Nepal: January to December (Van der Poel & Smetacek 2022).

Elevation: 150–1,580 m (Smith 1994; Van der Poel & Smetacek 2022).

Distribution on the Indian Subcontinent: East Uttarakhand in India eastward to Nepal, south to southeastern Madhya Pradesh and northern Chhattisgarh, northern Eastern Ghats, southern West Bengal, northeastern India, Bhutan, and Bangladesh (Van Gasse 2018).

Distribution in Nepal: Terai region, Gandaki Province including the Pokhara Valley, Bagmati Province including the Kathmandu Valley, and Koshi Province (Van der Poel & Smetacek 2022).

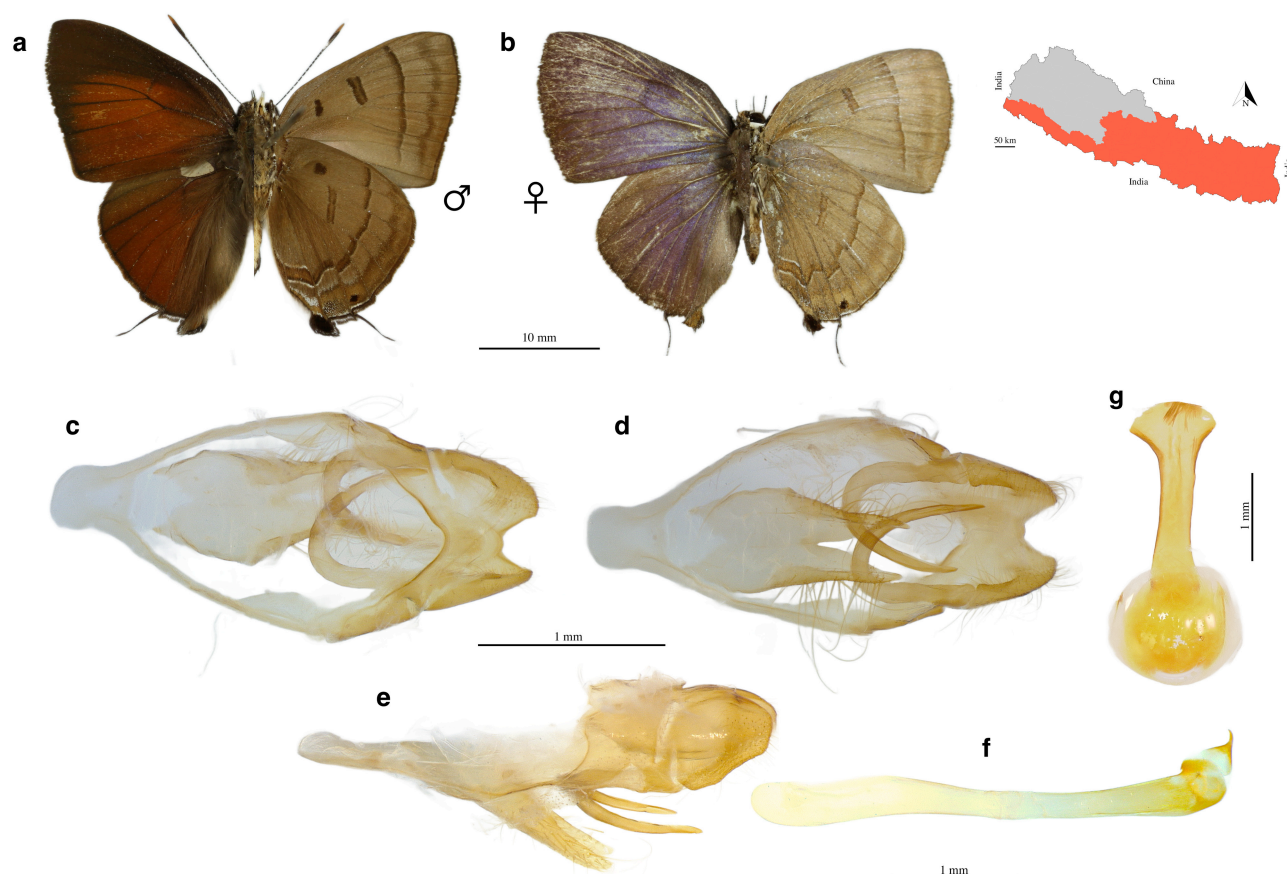


FIGURE 11. *Rapala pheretima petosiris* (Hewitson, 1863), with distribution map indicating confirmed occurrences (red) and areas lacking records (gray) in Nepal. a. Male spread specimen from Khasi Hills, India; b. Female spread specimen from Khasi Hills, India; c. Male genitalia dorsal view without aedeagus; d. Male genitalia ventral view without aedeagus; e. Male genitalia lateral view without aedeagus; f. Aedeagus lateral view; g. Female genitalia, ductus and corpus bursae.

10. *R. tara* de Nicéville, [1889] Figs 1k, 12

Rapala tara de Nicéville, [1889]: 284

Type locality: Sylhet (India)

Common Name: Assam Flash

Material Examined: **NEPAL. Bagmati Province. Lalitpur.** Godavari, 21.x.1970, 1495 m, leg. C.P. Smith (ANHM, 1♀). **Gandaki Province. Kaski.** Dhampus, 3.viii.1990, 1100 m, leg. C.P. Smith (ANHM, 1♀). **Koshi Province. Taplejung.** Chilauni, 7.vii.1996, 1530 m, leg. C.P. Smith (ANHM, 1♂). **INDIA. Meghalaya.** Khasi Hills, leg. Le Moulton, MGCL 1201232, Genitalic Vial KW-24-91 (MGCL, 1♂) (Fig. 12a); same locality, vi.1938, MGCL 1201233, Genitalic Vial KW-24-109 (MGCL, 1♀) (Fig. 12b).

Wingspan: 33–41 mm (Van der Poel & Smetacek 2022).

Diagnosis (Figs 12a, 12b): *Rapala tara* can be distinguished from its congeners in Nepal by the presence of a discal black brand on the male's forewing dorsally, similar to that of *Hypolycaena erylus* (Godart, [1824]), set against a brilliant blue background. The female is dull brownish purple above. Ventrally, it differs from similar yellow or ochraceous congeners by its hindwing postdiscal band, which is widely broken in spaces 2 and 3 and gets very wide in space 1. Males are ochraceous ventrally while females are deep yellow.

Male Genitalia (Figs 12c–12e): Aedeagus vesica with a large longitudinal cleft in the middle; valvae short and slender with apices narrowed; cleft between the valvae less than half the length of the valval plate.

Female Genitalia (Fig. 12f): Anterior apophysis very short and stubby; ductus bursae short and wide with base narrowed and distal end enlarged and convex; corpus bursae with a short longitudinal signum on either side bearing minute spines laterally on the inside, and a wide patch of signum connected to the base of ductus bursae.

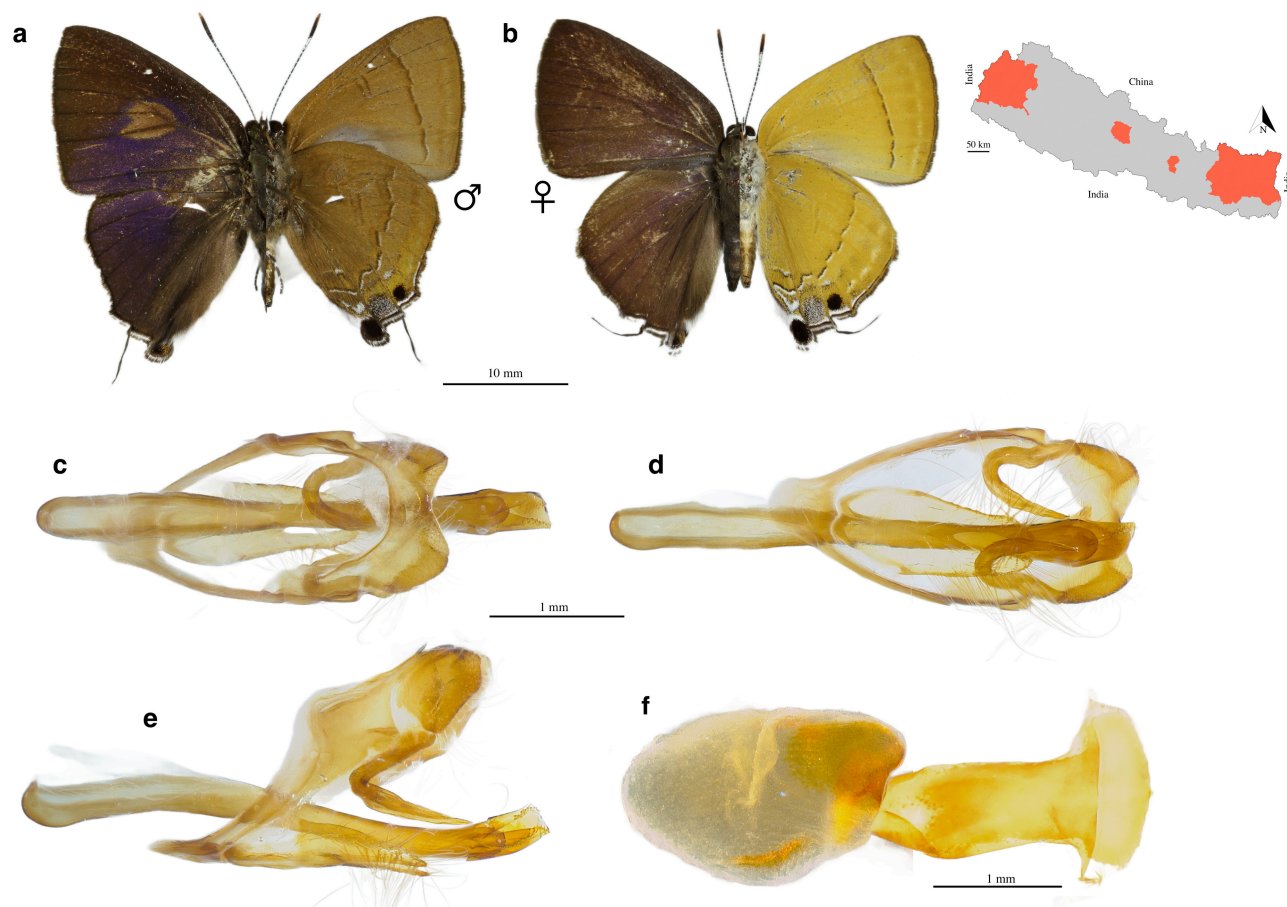


FIGURE 12. *Rapala tara* de Nicéville, [1889], with distribution map indicating confirmed occurrences (red) and areas lacking records (gray) in Nepal. a. Male spread specimen from Khasi Hills, India; b. Female spread specimen from Khasi Hills, India; c. Male genitalia dorsal view; d. Male genitalia ventral view; e. Male genitalia lateral view; f. Female genitalia, ductus and corpus bursae.

Biology: Not known.

Natural History: Adults are typically found in forests, streams, and gardens (Van der Poel & Smetacek 2022).

Variation: In some individuals, the bands may be slightly wider.

Phenology in Nepal: March to November (Van der Poel & Smetacek 2022).

Elevation: 850–1,650 m (Smith 1994; Van der Poel & Smetacek 2022).

Distribution on the Indian Subcontinent: East Uttarakhand in India eastward to Nepal with disjunct records, northeastern India, Bhutan, and northeastern Bangladesh (Van Gasse 2018).

Distribution in Nepal: Sudurpaschim Province (excluding the Terai districts), Pokhara Valley, Kathmandu Valley, and Koshi Province (excluding the Terai districts) (Van der Poel & Smetacek 2022).

11. *R. rosacea* de Nicéville, [1889] Figs 1j, 13

Rapala rosacea de Nicéville, [1889]: 285

Type locality: Sikkim (India)

Common Name: Rosy Flash

Material Examined: NEPAL. Gandaki Province. Kaski. Pokhara, Phewatal, 15.iii.1986, 795 m, leg. C.P. Smith (ANHM, 1♂); Rupatal, 29.ii.1992, 370 m, leg. C.P. Smith (ANHM, 1♂). **Syangja.** Putalikhet, 6.ii.1970, 855 m, leg. C.P. Smith (ANHM, 1♂) (Fig. 13).

Wingspan: 38–40 mm (Van der Poel & Smetacek 2022 for *R. reactivitta*)

Diagnosis (Figs 13a, 13b): *Rapala rosacea* can be distinguished from its congeners by the narrow, often undulating dark brown postdiscal lines on its ventral wings, set against a vinous red or pink background, along with its pinkish palpi. The only other species with a similar pink background are *R. reactivitta*, *R. nissa*, and *R. huangi*, all of which have postdiscal lines with bronze color that are often wider. De Nicéville ([1889], p. 285) noted: “The reddish-vinous coloration of the underside at once distinguishes it from all the species of the genus known to me”.

Male Genitalia (Figs 13c): Aedeagus with a short vesica, pointed to one side; valvae slender and elongated; cleft between the valvae more than half the length of the valval plate.

Biology: Not known; however, based on its seasonality, larvae potentially feed on the flowers of Rosaceae.

Natural History: Adults are typically found in forests, on flowers, particularly those of *Rubus ellipticus* Sm., and along open rural trails.

Variation: Variation occurs in the postdiscal bands which can range from slightly broken to unbroken. Some individuals are potentially gray as discussed below in the remarks.

Phenology in Nepal: The rosy form flies mostly from February to mid-March after which a gray form takes over with similarly thin bands which might be *R. nissa* complex.

Elevation: 450–2,200 m (personal observation)

Distribution on the Indian Subcontinent: Nepal, northeastern India (Van Gasse 2018).

Distribution in Nepal: Kaski, Lamjung, and Lalitpur districts, but certainly more widespread across the hilly region.

Remarks: This species was recorded by Smith (1994, 2006, 2011a, 2011b) and later by Van der Poel & Smetacek (2022) as *R. reactivitta*. Colin Smith likely followed Evans (1932), who considered *R. rosacea* a form of *R. reactivitta*. Upon examination, all specimens previously identified as *R. reactivitta* in the studied Nepalese collections (ANHM and SNHM) were found to represent either *R. nissa*, *R. huangi*, or *R. rosacea*. All authors of this study have recorded *R. rosacea* in Nepal: SKC from Kaski (Pokhara), Lamjung (Bhorletar), and Lalitpur (Godavari) districts; PvdP from Kaski (Pokhara) District; SP and AS from Kaski (Pokhara) District; and MSL from Lalitpur (Godavari) District. Notably, the rosy, reddish-vinous-colored *R. rosacea* occurs mostly from February to mid-March in Nepal, after which only grayer individuals are observed. This suggests that *R. rosacea* is an early spring univoltine butterfly in Nepal, emerging from February to mid-March after which only *R. nissa* complex, including *R. reactivitta*, flies. However, Inayoshi (2024) suggests that the phenology of *R. rosacea* extends until December in Thailand and Vietnam. Further research is needed on the phenology and possible morphological variation of this taxon.

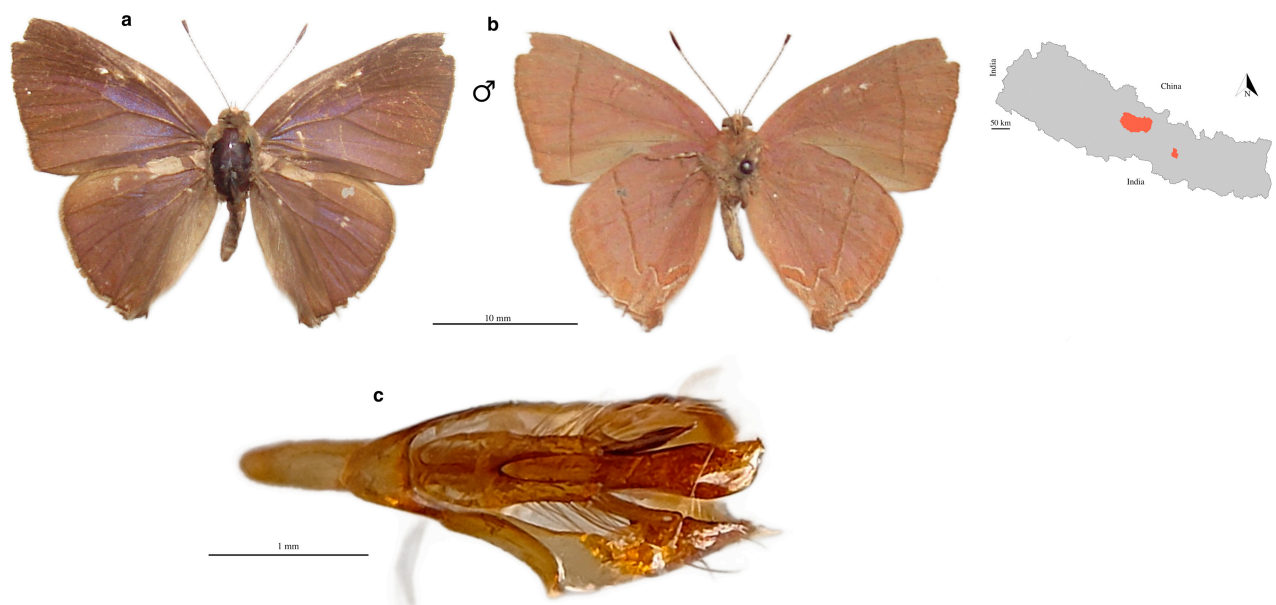


FIGURE 13. *Rapala rosacea* de Nicéville, [1889], with distribution map indicating confirmed occurrences (red) and areas lacking records (gray) in Nepal. a. Male spread specimen from Kaski District, Nepal, dorsal view; b. Same specimen, ventral view; c. Male genitalia ventral view.

12. *R. dienece dienece* (Hewitson, 1878) Figs 11, 14

Deudorix dienece Hewitson, 1878: 31

Type locality: Singapore

Common Name: Scarlet Flash

Material Examined: **INDONESIA. Sumatra. Aceh Province.** Simeulue, xi.1992, MGCL 1201843, Genitalic Vial KW-24-98 (MGCL, 1♂) (Fig. 14a); same data, MGCL 1206505, Genitalic Vial KW-24-116 (MGCL, 1♂). **North Sumatra Province.** Utara, Prapat, 9.vi.1963, leg. Dr. Diehel, MGCL 1201844, Genitalic Vial KW-24-111 (MGCL, 1♀) (Fig. 14b).

Wingspan: 30–36 mm (Van der Poel & Smetacek 2022).

Diagnosis (Figs 14a, 14b): *Rapala dienece dienece* can be distinguished from similar congeners with red dorsal wings occurring in Nepal by its red coloration, which is typically confined to the areas below and beside the cell on both the dorsal fore- and hindwing. The male differs from the similar-looking *R. damona* primarily by its more confined red coloration on the dorsal hindwing that does not extend into space 7. Ventrally, *R. dienece dienece* can be distinguished from *R. damona* by the tornal patch of blue speckles in hindwing space 1c which is far away from the band, prominent orange crown above the black tornal spot in space 2, and forewing postdiscal band, which is mostly straight. Male is red above, while female is brown.

Male Genitalia (Figs 14c–14e): Aedeagus vesica with two hook-shaped tips projected upward in the same fashion as in *R. pheretima* (cf. one hook only), one much larger than the other; valvae elongated and sinuate with narrowed apices; cleft between the valvae more than half the length of the valval plate.

Female Genitalia (Fig. 14f): Anterior apophysis short; ductus bursae very slender and elongated with distal end lacking a distinct head; corpus bursae round and bulbous with a thick center, a short signum on either side near the apex with a single large hook-shaped spine inside.

Biology: The larvae are known to feed on the flowers of *Durio zibethinus* Murray, *Syzygium grande* (Wight) N.P. Balakr., *Nephelium lappaceum* L. (Ek-Amnuay 2012), and *Allophylus triphyllus* (Burm.fil.) Merr. (Wynter-Blyth 1957).

Natural History: Adults are typically found in sparse forests (Van der Poel & Smetacek 2022).

Variation: The postdiscal bands on ventral forewing range from straight to angulated in the middle. The brightness of the orange crown on the black tornal spot on the ventral hindwing may also vary.

Phenology in Nepal: August (Smith 1994).

Elevation: 180 m (Smith 1994).

Distribution on the Indian Subcontinent: Northeastern India, Bangladesh, and westward to the eastern Terai of Nepal (Van Gasse 2018).

Geographic Distribution: Jhapa District (Van der Poel & Smetacek 2022), potentially in Bandipur, Tanahun District (Fig. 11).

Remarks: In Nepal, *R. dienece* has been recorded only once, in August 1974, from Jhapa District (Smith 1994; Van der Poel & Smetacek 2022). A tentative record by the first author from Bandipur, Tanahun District, on June 8, 2019, at 1,040 m (Fig. 11) remains unverified due to the absence of dorsal images.

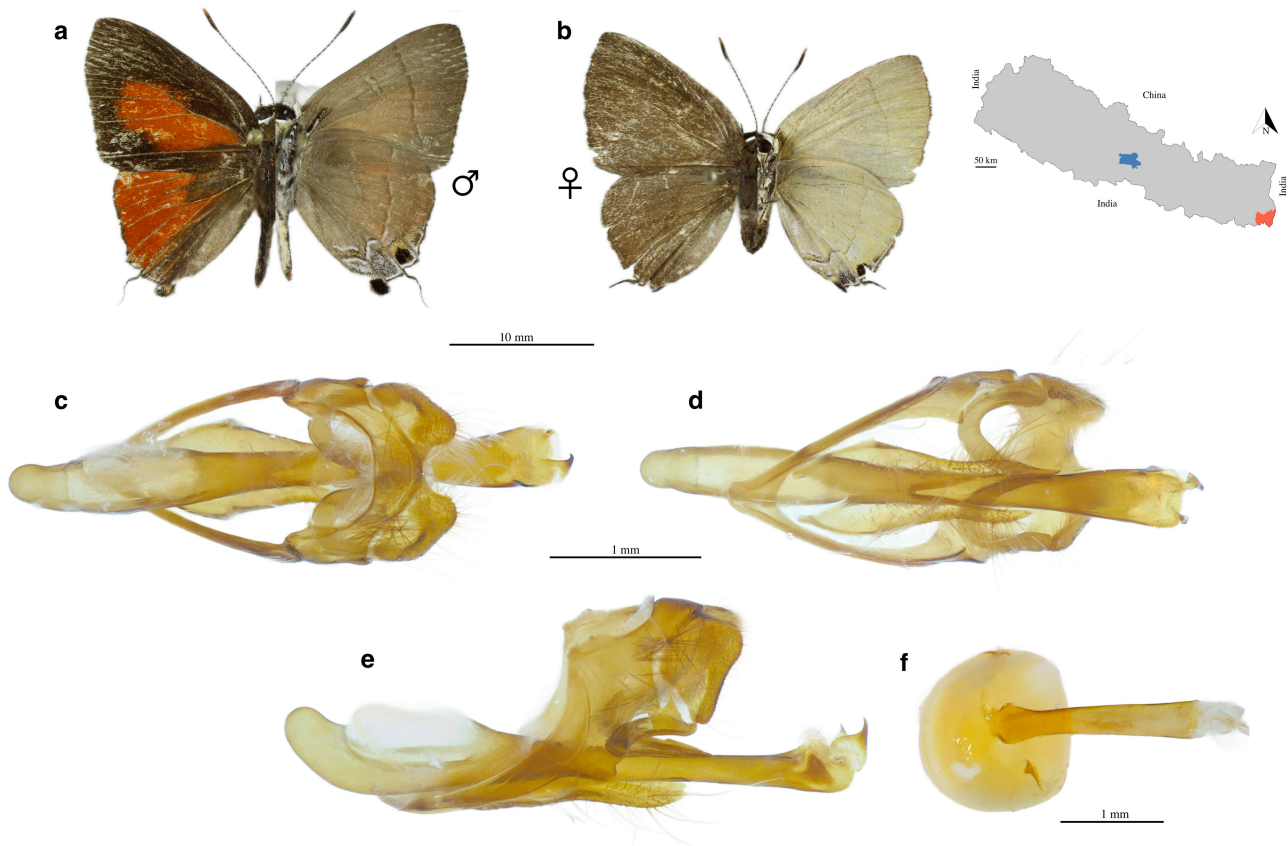


FIGURE 14. *Rapala dienece dienece* (Hewitson, 1878), with distribution map indicating confirmed occurrences (red), potential occurrences (blue), and areas lacking records (gray) in Nepal. a. Male spread specimen from Sumatra, Indonesia; b. Female spread specimen from Sumatra, Indonesia; c. Male genitalia dorsal view; d. Male genitalia ventral view; e. Male genitalia lateral view; f. Female genitalia, ductus and corpus bursae.

13. *R. damona* Swinhoe, 1890 Fig. 15

Rapala damona Swinhoe, 1890: 450

Type Locality: South Andamans

Common Name: Malay Red Flash

Material Examined: **INDONESIA. Sumatra. West Sumatra Province.** Mentawai Island, Padang Paria, Sipora, Sioban, vi.1993, leg. Widagdo, MGCL 1201846, Genitalic Vial KW-24-97 (MGCL 1♂) (Fig. 15a); **Java.** Kangean, viii.1992, MGCL 1201845, Genitalic Vial KW-24-112 (MGCL, 1♀) (Fig. 15b).

Wingspan: 33–35 mm (Van der Poel & Smetacek 2022).

Diagnosis (Figs 15a, 15b): *Rapala damona* can be distinguished from similar congeners in Nepal with red dorsal wings by the red coloration which is usually confined below and beside the cell on the dorsal fore- and hindwing. The male differs from the similar-looking *R. dienece* primarily by its red coloration extending into space 7 on the

dorsal hindwing. Ventrally, it can be distinguished from *R. dienece* usually by the tornal patch of blue speckles in hindwing space 1c which is very close to the band, orange crown above the black tornal spot in space 2 obscure or smeared, and forewing postdiscal band, which is mostly curved or bent at the apical quarter. Male is red above while female is brown; ventrally, male is yellowish-brown while female is pale yellowish.

Male Genitalia (Figs 15c–15e): Aedeagus vesica with two recurved hook-shaped tips, one barely visible except on lateral view; valvae elongated and sinuate with narrowed apices; cleft between the valvae more than half the length of the valval plate.

Female Genitalia (Fig. 15f): Anterior apophysis short; ductus bursae gradually widened distally without a distinct head; corpus bursae with a thick center, and a short signum on either side near the apex with a single large hook-shaped spine inside.

Biology: Not known.

Natural History: Adults are found in forests and on flowers (Van der Poel & Smetacek 2022).

Variation: The veins on the dorsal hindwing in males may occasionally be dark, as in *R. dienece*.

Phenology in Nepal: November (Smith 1994).

Distribution on the Indian Subcontinent: Andamans, northeastern India, and westward to the eastern Terai of Nepal (Van Gasse 2018).

Distribution in Nepal: Jhapa District (Smith 1994).

Elevation: 240–340 m (Smith 1994).

Remarks: In Nepal, *R. damona* has been recorded only once, in November 1979, from Jhapa District, where three specimens were collected over two days (Smith 1994; Van der Poel & Smetacek 2022). Smith's private Excel database lists the locality as Ilam, leading Van der Poel & Smetacek (2022) to attribute this occurrence to Ilam District.

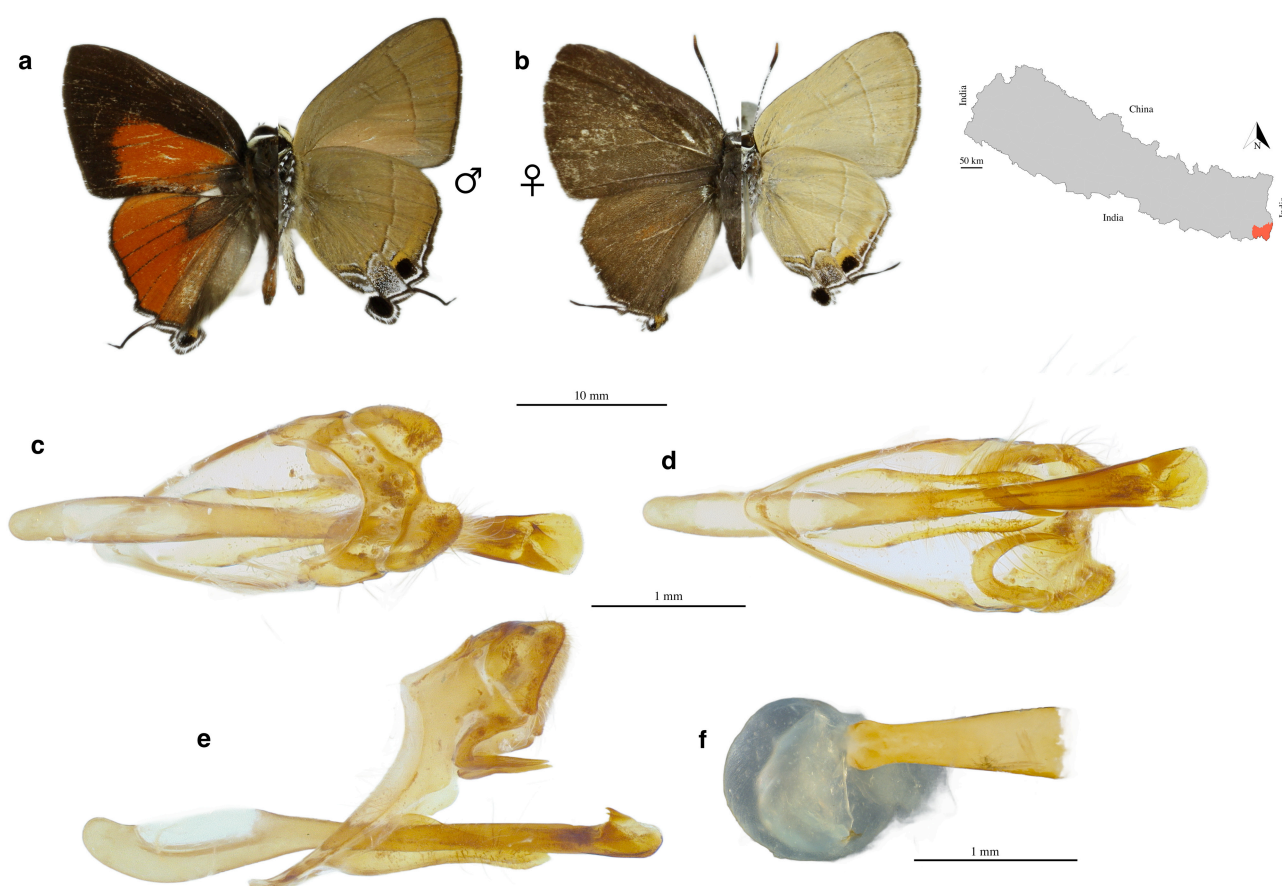


FIGURE 15. *Rapala damona* Swinhoe, 1890), with distribution map indicating confirmed occurrences (red) and areas lacking records (gray) in Nepal. a. Male spread specimen from Sumatra, Indonesia; b. Female spread specimen from Java, Indonesia; c. Male genitalia dorsal view; d. Male genitalia ventral view; e. Male genitalia lateral view; f. Female genitalia, ductus and corpus bursae.

Discussion

Historically, all the species of *Rapala* listed in this paper have been documented from Nepal, except for *R. rosacea*. Though not rare within its distribution range, this species was previously treated as *R. reactivitta* most likely because Evans (1932) treated it as a form of the latter. Cantlie (1962) noted that Corbet (1939) indicated distinct genitalia of *R. rosacea* compared to the other members of the *R. nissa* complex, thereby reinstating its species status. Interestingly, all the examined specimens identified as *R. reactivitta* from Nepal belonged to either *R. rosacea*, *R. nissa*, or *R. huangi*, so no collected specimen of *R. reactivitta* was found from Nepal. Nevertheless, reliable photographic records, such as the one presented here, support the presence of *R. reactivitta* in Nepal. *Rapala reactivitta* may be more widespread across Nepal than currently documented, though it appears uncommon based on the available collection data. However, its true prevalence may be underestimated owing to its frequent misidentification with *R. nissa*, a morphologically similar congener, in the field.

Similarly, *R. huangi* is often mistaken for *R. nissa* and likely to have a much broader distribution in Nepal, as it ranges from northwestern to northeastern India, Yunnan in China, and Myanmar. Although *R. huangi* is generally characterized by an outwardly curved postdiscal band on the ventral forewing (Nakamura & Seki 2019), this study documented an individual from Shillong in Meghalaya, India with a straight band resembling that of *R. nissa*. Conversely, *R. nissa* occasionally exhibits an outwardly curved forewing band similar to *R. huangi*, rendering field identification potentially unreliable; furthermore, both species are sympatric in Nepal. *Rapala hinomaru*, described by Fujioka (1970) from a single female specimen collected in 1963 in eastern Nepal, belongs to the *R. nissa* species complex, as also suggested by Smith (2010). Although *R. nissa* and *R. huangi* are cryptic species as mentioned earlier, the ventral forewing pattern of the *R. hinomaru* holotype closely resembles that of the *R. nissa* holotype and should therefore be considered its junior subjective synonym. It remains unclear whether species such as *Rapala dienece* and *R. damona* are merely occasional strays or have stable populations in the eastern Terai region of Nepal, necessitating further research. Additionally, two more *Rapala* taxa potentially occur in Nepal: *R. iarbus sorya* (Kollar, [1844]) and *R. varuna grisea* (Moore, 1879), particularly in the western region, given their distribution in the adjacent Indian regions.

Acknowledgments

The authors express their sincere gratitude to the McGuire Center for Lepidoptera and Biodiversity, Gainesville, Florida, USA, and to Ramesh Shrestha, curator of the Annapurna Natural History Museum, Pokhara, Nepal, for granting access to specimens for examination. They are also thankful to the Department of Zoology, Prithvi Narayan Campus, Pokhara, for providing laboratory facilities used for the genitalia examination of *Rapala rosacea*. Special thanks are extended to Yuichi Oba of the Chubu University Butterfly Museum, Kasugai, Japan, for providing color images of the *R. hinomaru* holotype, and to Ishan Gautam, Chief of the Swayambhu Natural History Museum, Kathmandu, Nepal, for allowing us to photograph *Rapala* species in their collection. The authors further acknowledge the Florida State Collection of Arthropods, Gainesville, Florida, USA, for permitting the use of their imaging equipment. They are grateful to Hao Huang and Norio Nakamura for their assistance with literature, reference images, and identification keys for *R. huangi*; to Richard C. Hoyer for providing images of *R. selira*; and to Albert Vliegenthart for sharing images of *R. reactivitta*. The authors thank the McGuire Student Publication Fund for financial support toward the publication of this work. Finally, the authors appreciate the valuable comments provided by Peter Smetacek, Darren Pollock, and the anonymous reviewer.

References

- Banerjee, D., Singhamahapatra, A. & Roy, S. (2023) New larval host plants for three butterfly (Lepidoptera, Papilionoidea) species from Rahr region of West Bengal, India. *Journal of Insect Biodiversity and Systematics*, 9 (1), 67–79.
<https://doi.org/10.52547/jibs.9.1.67>
- Bhakare, M. & Ogale, H. (2018) *A Guide to Butterflies of Western Ghats (India) Includes Butterflies of Kerala, Tamilnadu, Karnataka, Goa, Maharashtra and Gujarat state*. Privately published, Satara, x + 496 pp.
- Cantlie, K. (1959) A new variety of *Rapala nissa ranta* Swinhoe. *Journal of the Bombay Natural History Society*, 56 (3),

- Cantlie, K. (1962) *The Lycaenidae Portion (Except the Arhopala Group), of Brigadier Evans' The Identification of Indian Butterflies 1932 (India, Pakistan, Ceylon, Burma)*. Bombay Natural History Society, Mumbai, 159 pp.
- COL (2025) *Catalogue of Life*. Available from: <https://www.catalogueoflife.org/> (accessed 4 February 2025)
- Corbet, A.S. (1939) A revision of the Malayan species of *Rapala* Moore (Lepidoptera: Lycaenidae). *Proceedings of the Royal Entomological Society of London*, Series B, Taxonomy, 8 (6), 103–112.
<https://doi.org/10.1111/j.1365-3113.1939.tb00501.x>
- Corbet, A.S. & Pendlebury, K.M. (1978) *The Butterflies of the Malay Peninsula. 3rd Edition. Revised by J.N. Eliot*. Art Printing Works, Kuala Lumpur, 577 pp., 35 pls.
- de Nicéville, L. ([1889]) On new or little-known Butterflies from the Indian Region. *Journal of the Asiatic Society of Bengal*, Part II, 57 (4), 273–293, pls. 13–14.
- de Nicéville, L. in Marshall, G.F.L. & de Nicéville, L. (1890) The Butterflies of India, Burmah and Ceylon: A Descriptive Handbook of All the Known Species of Rhopaloceros Lepidoptera Inhabiting That Region, With Notices of Allied Species Occurring in the Neighbouring Countries Along the Border, With Numerous Illustrations. Vol. 3. *The Butterflies of India, Burmah and Ceylon*, 3, 1–503, pls. 25–29.
- Dhital, M.R. (2015) *Geology of the Nepal Himalaya: Regional Perspective of the Classic Collided Orogen*. Springer, Cham, 522 pp.
<https://doi.org/10.1007/978-3-319-02496-7>
- Ek-Amnuay, P. (2012) *Butterflies of Thailand. 2nd Edition. Revised*. Baan Lae Suan Amarin Printing and Publishing, Bangkok, 943 pp.
- Evans, W.H. (1932) *The Identification of Indian Butterflies. 2nd Edition. Revised*. Bombay Natural History Society, Bombay, x + 454 pp., 32 pls.
- Evans, W.H. (1949) *A catalogue of the Hesperidae from Europe, Asia and Australia in the British Museum (Nat. Mus.), London*. Trustees of British Museum, London, xx + 502 pp., 53 pls.
<https://doi.org/10.5962/bhl.title.105941>
- Fabricius, J.C. (1787) Mantissa insectorum sistens species nuper detectas adiectis synonymis, observationibus, descriptionibus, emendationibus. *Mantissa Insectorum*, 2, 1–382.
- Fleming, W.A. (1975) *Butterflies of West Malaysia and Singapore. Vol. II*. Kuala Lumpur, Singapore, ix + 943 pp.
- Fruhstorfer, H. (1914) Neue Lycaeniden. *Deutsche Entomologische Zeitschrift Iris*, 27 (4), 172–178.
<https://doi.org/10.1002/mmnd.48019140211>
- Fujioka, T. (1970) Butterflies collected by the Lepidopterologica Research Expedition to Nepal Himalaya, 1963. Part 1. Papilionoidea. *Special Bulletin of the Lepidopterological Society of Japan*, 4, 1–125, 15 figs., 31 pls.
- FUNET (2025) *Lepidoptera Perhoset Butterflies and Moths*. Available from: https://ftp.funet.fi/index/Tree_of_life/insecta/lepidoptera/ (accessed 6 February 2025)
- GBIF (2025) Available from: <https://www.gbif.org/> (accessed 6 February 2025)
- Hewitson, W.C. (1863) *Illustrations of Diurnal Lepidoptera: Lycaenidae*. Paternoster Row, London. [unknown pagination]
<https://doi.org/10.5962/bhl.title.43819>
- Hewitson, W.C. (1878) *Illustrations of Diurnal Lepidoptera: Lycaenidae. Vol. I*. J. Van Voorst, London. [unknown pagination]
- Huang, H. (2003) A list of butterflies collected from Nujiang (Lou Tse Kiang) and Dulongiang, China with descriptions of new species, and revisional notes. *Neue Entomologische Nachrichten*, 55, 3–114.
- Huang, H. (2023) New or little-known butterflies from China 5. *Neue Entomologische Nachrichten*, 82, 93–214.
- iNaturalist (2025) *A Community for Naturalists - iNaturalist*. Available from: <https://www.inaturalist.org> (accessed 2 January 2025)
- Inayoshi, Y. (2024) *A Check list of Butterflies in Indo-China, Chiefly from Thailand, Laos & Vietnam*. Available from: <http://yutaka.it-n.jp/> (accessed August–November 2024)
- Jayaraj, S., Abdul Kareem, A. & Vasudeva Menon, P.P. (1961) A new fruit borer pest *Rapala varuna* Horsfield (Lepidoptera: Lycaenidae) on guava in South India. *Journal of the Bombay Natural History Society*, 58 (1), 296–299.
- Kalawate, A.S., Palot, M.J., Valappil, B., Tripathy, B. & Banerjee, D. (2024) *A Field Guide to Common Butterflies and Moths (Lepidoptera) of Western Ghats*. Zoological Survey of India, Kolkata, 206 pp.
- Kehimkar, I.D. (2008) *The Book of Indian Butterflies*. Bombay Natural History Society, Oxford University Press, Mumbai, 497 pp.
- Kehimkar, I.D. (2016) *BNHS Field Guides, Butterflies of India*. Bombay Natural History Society, Oxford University Press, Mumbai, 516 pp.
- Klots, A.B. (1970) Lepidoptera. In: Tuxen, S.L. (Ed.), *Taxonomist's Glossary of Genitalia in Insects. 2nd Edition*. Munksgaard, Copenhagen, pp. 115–130.
- Kollar, V. ([1844]) Aufzählung und Beschreibung der von Freiherr C. v. Hügel auf seiner Reise durch Kaschmir und das Himalayagebirge gesammelten Insekten. In: *Hügel, Kaschmir und das Reich der Siek*, 4, 393–564, pls. 1–28.
- Kumar, C. (2013) Status of *Rapala selira* (Moore) (Lepidoptera: Lycaenidae) with notes of variations in genitalia and wing venation from the north-west Himalaya in India. *Pakistan Entomologist*, 35 (2), 105–108.
- Kunte, K., Sondhi, S. & Roy, P. (Eds) (2025) *Butterflies of India*, v. 4.27. Indian Foundation for Butterflies. Available from: <https://www.ifoundbutterflies.org> (accessed 30 July 2025).

- Moore, F. (1874) List of Diurnal Lepidoptera collected in Cashmere Territory by Capt. R.B. Reed, 12th Regt., with Descriptions of new Species. *Proceedings of the Zoological Society of London*, 1874 (1), 264–274, pl. 43.
<https://doi.org/10.1111/j.1096-3642.1874.tb02482.x>
- Moore, F. (1879) Descriptions of new Asiatic Diurnal Lepidoptera. *Proceedings of the Zoological Society of London*, 1879 (1), 136–144.
<https://doi.org/10.1111/j.1096-3642.1879.tb02637.x>
- Moore, F. (1881) The Lepidoptera of Ceylon. *Lepidoptera of Ceylon*, 1 (3), 81–136, pls. 37–54.
<https://doi.org/10.1038/025079e0>
- Mukherjee, K. (2021) New larval host plants for the Slate flash, Black rajah and Tiny grass blue butterflies (Insecta: Lycaenidae, Nymphalidae) from Bankura, West Bengal, India. *Journal of Animal Diversity*, 3 (4), 56–63.
<https://doi.org/10.52547/JAD.2021.3.4.8>
- Mukherjee, K. (2022) Additions to the known larval host plants of *Leptosia nina* (Fabricius, 1793), and *Rapala manea* (Hewitson, 1863) (Insecta: Lepidoptera, Pieridae, Lycaenidae) from Bankura, West Bengal, India. *Bionotes*, 24 (3), 290–301.
- Naik, D. & Mustak, M.S. (2020) Additions to known larval host plants of butterflies of the Western Ghats, India. *Journal of Threatened Taxa*, 12 (1), 15205–15207.
<https://doi.org/10.11609/jott.4770.12.1.15205-15207>
- Nakamura, N. & Seki, Y. (2017) Reexamination of *Rapala nissa* (Lycaenidae, Lepidoptera) and related taxa. *Butterflies*, 76, 4–14.
- Nakamura, N. & Seki, Y. (2019) Identification of the females of *Rapala nissa* and *R. huangi* (Lycaenidae, Lepidoptera). *Butterflies*, 80, 4–10.
- Nitin, R., Balakrishnan, V.C., Churi, P.V., Kalesh, S., Prakash, S. & Kunte, K. (2018) Larval host plants of the butterflies of the Western Ghats, India. *Journal of Threatened Taxa*, 10 (4), 11495–11550.
<https://doi.org/10.11609/jott.3104.10.4.11495-11550>
- Payra, A. & Bhatt, C.B. (2024) New larval host plants of *Euchrysops cnejus* (Fabricius, 1798) and *Rapala manea schistacea* (Moore, 1879) from Eastern India (Lepidoptera: Lycaenidae). *SHILAP Revista de Lepidopterología*, 52 (206), 369–374.
<https://doi.org/10.57065/shilap.918>
- Robinson, G.S., Ackery, P.R., Kitching, I., Beccaloni, G.W., Hernández, L.M. (2023) *HOSTS (from HOSTS - a Database of the World's Lepidopteran Hostplants)*. Natural History Museum, London, Dataset Resource. Available from: <https://data.nhm.ac.uk/dataset/hosts/resource/877f387a-36a3-486c-a0c1-b8d5fb69f85a> (accessed 6 February 2025)
- Smetacek, P. (2017) *A Naturalist's Guide to the Butterflies of India, Pakistan, Nepal, Bhutan, Bangladesh and Sri Lanka*. John Beaufoy Publishing Ltd., Oxford, 176 pp.
- Smith, C.P. (1994) *Butterflies of Nepal (Central Himalaya)*, Tecpress Service, Bangkok, 368 pp.
- Smith, C.P. (2006) *Illustrated Checklist of Nepal's Butterflies. Revised 2nd Edition*. Walden Bookhouse, Kathmandu, ii + 129 pp.
- Smith, C.P. (2010) *Lepidoptera of Nepal*. Himalayan Nature, Sigma General Press, Kathmandu, 184 pp.
- Smith, C.P. (2011a) *Illustrated Checklist of Nepal's Butterflies. New Revised & Updated Edition*. Lashkar, Kathmandu, ii + 129 pp.
- Smith, C.P. (2011b) *Butterflies of the Annapurna Conservation Area*. Annapurna Conservation Area Project, Sanepa, Lalitpur, 154 pp.
- Smith, C.P. (2011c) *A Photographic Pocket Guide to Butterflies of Nepal*. Himalayan MapHouse, Kathmandu, Nepal, 144 pp.
- Sondhi, S., Kunte, K., Agavekar, G., Lovalekar, R. & Tokekar, K. (2013) *Butterflies of the Garo Hills*. Samrakshan Trust, New Delhi, Titli Trust, Dehradun and Indian Foundation for Butterflies, Bengaluru, xvi + 200 pp.
- Swinhoe, C. (1890) Descriptions of three new species of Lycaenidae. *Annals and Magazine of Natural History*, Series 6, 5 (30), 449–451.
<https://doi.org/10.1080/00222939009460862>
- Swinhoe, C. (1897) New eastern Lepidoptera. *Annals and Magazine of Natural History*, 19 (112), 407–410.
<https://doi.org/10.1080/00222939708680557>
- Swinhoe, C. (1911) n.k. In: *Lepidoptera Indica. Vol. 9. Rhopalocera, Family-Lycaenidae*. Lovell Reeve & Co., Limited, London, pp. 56–58, pl. 718, figs. 1 + la + lb.
- Van der Poel, P. & Smetacek, P. (Eds.) (2022) *An Annotated Catalogue of the Butterflies of Nepal. Bionotes: Occasional Paper 1*. Butterfly Research Centre, Bhimtal, vii + 241 pp.
- Van Gasse, P. (2018) *Butterflies of the Indian Subcontinent—Annotated Checklist*. Available from: https://www.biodiversityofindia.org/images/2/2c/Butterflies_of_India.pdf (accessed 7 February 2025)
- Varshney, R.K. & Smetacek, P. (Eds) (2015) *A Synoptic Catalogue of the Butterflies of India*. Butterfly Research Centre, Bhimtal and Indinov Publishing, New Delhi, ii + 261 pp., 8 pls.
- Wynter-Blyth, M.A. (1957) *Butterflies of the Indian Region*. Bombay Natural History Society, Bombay, 523 pp.
- Xie, Y., Shen, W., Han, J. & Deng, X. (2021) Determination of the height of Mount Everest using the shallow layer method. *Geodesy and Geodynamics*, 12 (4), 258–265.
<https://doi.org/10.1016/j.geog.2021.04.002>