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REVIEW

CONTRIBUTIONS TO THE KNOWLEDGE OF MOTHS OF BOMBYCOIDEA LATREILLE, 1802 (LEPIDOPTERA: HETEROCERA) OF BHUTAN WITH NEW RECORDS

Jatishwor Singh Irungbam & Meenakshi Jatishwor Irungbam

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CONTRIBUTIONS TO THE KNOWLEDGE OF MOTHS OF BOMBYCOIDEA LATREILLE, 1802 (LEPIDOPTERA: HETEROCERA) OF BHUTAN WITH NEW RECORDS

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Abstract: An annotated checklist of the superfamily Bombycoidea (Lepidoptera) of Bhutan is given, including three taxa of the family Bombycidae, two of Brahmaeidae, four of Endromidae, 12 of Eupterotidae, 37 of Saturniidae, and 93 of Sphingidae. Among these, 14 taxa are new records for the country: two Bombycidae (*Penicillifera apicalis* (Walker, 1862) and *Trilocha varians* (Moore, 1855)), two Endromidae (*Mustilizans hepatica* (Moore, 1879) and *Comparmustilia sphingiformis* (Moore, 1879)), three Saturniidae (*Saturnia cidosa* Moore, 1865, *Loepa sikkima* (Moore, [1866]), and *Salassa thespis* (Leech, 1890)), and seven Sphingidae (*Rhodoprasina floralis* (Butler, 1876), *Amphypterus masoni masoni* (Clark, 1924), *Acosmerycoides harterti* (Rothschild, 1895), *Hippotion celerio* (Linnaeus, 1758), *Theretra tibetiana* Vagla & Haxaire, 2010, *T. silhetensis silhetensis* (Walker, 1856), and *Cechenena helops helops* (Walker, 1856)).

Keywords: Bombycidae, Brahmaeidae, Endromidae, Eupterotidae, new country record, Saturniidae, Sphingidae.

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Author contribution: JSI conceived and designed the study; JSI & MJ collected the materials, processed, identified the materials, compiled the checklist; and JSI prepared the manuscript.

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INTRODUCTION

The superfamily Bombycoidea comprises 10 families of the most charismatic and well-studied moths, grouped currently into 520 genera and 6,092 named species (Kitching et al. 2018). The Bombycoidea of the Indian subcontinent are relatively poorly studied and those of Bhutan, where the superfamily is represented by members of the families Eupterotidae, Brahmaeidae, Bombycidae, Endromidae, Saturniidae, and Sphingidae, have never been intensively researched. Thus, data on the bombycoid fauna of the country are very limited in terms of taxonomy, ecology, and distribution. A few works published include information on the Bombycoidea fauna of Bhutan: Dudgeon (1898a,b), Hampson (1892, 1910), Bell & Scott (1937), Dierl (1975), Brechlin (1997, 2009a,b,c,d, 2010a,b, 2014a,b,c, 2015), Schnitzler & Stünning (2009), Irungbam & Kitching (2014), Geilis & Wangdi (2017), Jamtsho & Irungbam (2019), and Irungbam & Norbu (2019), and these have mostly focused on Saturniidae and Sphingidae. In the present paper, we present the results of the survey conducted in central and southern Bhutan, together with a collation of all earlier known records of Bhutanese Bombycoidea.

MATERIALS AND METHODS

Study area

Bhutan is in the eastern part of the Himalaya and is bordered to the south, east, and west by India and to the north by Tibet (autonomous region of China). The country is 38,500 km² in area, of which 72% is covered by forest. Approximately 60% of the land area falls under protected areas comprising 10 national parks and sanctuaries. The landscape ranges from subtropical plains in the south to the Himalayan heights in the north. The major forest types are fir forests, mixed conifer forests, blue pine forests, chir pine forests, broadleaf mixed with conifer, upland hardwood forests, lowland hardwood forests, and tropical lowland forests. The forest in the study area in central and southern Bhutan consists of eastern Himalayan subalpine conifer forests at higher elevations and eastern Himalayan broadleaf forest at lower elevations.

Sampling site

Moths were surveyed at nine localities in central and southern Bhutan (Tsirang, Dagana, Sarpang, Gelephu, Zhemgang, Trongsa, and Bumthang). The details of trapping localities, including GPS coordinates

and elevations, are provided in previous publications (Irungbam et al. 2016, 2017).

Sampling period and time

Over a period of three years (2013–2015), each study site was visited once a month. Nocturnal moths were recorded with light traps (run between 18.00–05.00 h) and diurnal species were observed during the day whenever the weather permitted.

Sampling techniques

Nocturnal field collection was carried out using either fluorescent bulbs hung in front of a vertical white cloth sheet or mercury vapour (MV) light traps (Irungbam et al. 2016). Moths were also collected from the whitewashed walls of residential homes and schools where fluorescent bulbs were kept lit throughout the night. Digital images of all moths were taken using Canon 1100D (Canon Inc., Tokyo, Japan) and Nikon Coolpix P510 (Nikon Inc., Tokyo, Japan) cameras. Voucher specimens were also collected for further investigation and were deposited in the Invertebrate Referral Collection Centre (IRCC), National Biodiversity Centre (NBC), Thimphu, Bhutan.

Review and Identification of species

Historical records were reviewed and recently collected specimens were identified by comparison with available literature (Dudgeon 1898a,b; Hampson 1892; Mell 1922; Bell & Scott 1937; Michener 1949; Dierl 1975; d'Abrera 1986 [1987]; Holloway 1987; Pinratana & Lampe 1990; Haruta 1992a,b, 1994, 1995; Pittaway 1993; Kishida 1993, 1994a,b, 1998; Kitching & Spitzer 1995; Chu & Wang 1996; Inoue et al. 1997; Kitching & Cadiou 2000; Pittaway & Kitching 2000; Kendrick 2002; Witt & Pugaev 2007; Nässig & Oberprieler 2007, 2008; Zolotuhin & Witt 2009; Vaglia et al. 2010; Rafi et al. 2014; Wang et al. 2015; Kaleka et al. 2017; Geilis & Wangdi 2017; Kitching et al. 2018; Sanyal et al. 2018; Jamtsho & Irungbam 2019; Irungbam & Norbu 2019). Online repositories available for the moths of Asia (Nakao 2019), Sphingidae (Kitching 2018; Pittaway & Kitching 2019), and Saturniidae (Näsig 2002; Paukstadt & Paukstadt 2018) were also accessed to compare and confirm the identity of the collected materials. Specimens with uncertain species identifications are referred as 'cf.' (confer meaning = to compare; Sigovini et al. 2016).

The classification and nomenclature follow Kitching et al. (2018), except for *Rhodoprasina nenulfascia* (q.v.) (Řezáč, 2018). For all identified species, general information on their local (in Bhutan) and global distributions are given.

RESULTS, DISCUSSION, AND CONCLUSION

The present checklist of the superfamily Bombycoidea (Lepidoptera) in Bhutan comprises three Bombycidae, two Brahmaeidae, four Endromidae, 12 Eupterotidae, 37 Saturniidae, and 93 Sphingidae (Table 1). New country records for Bhutan are two Bombycidae (*Penicillifera apicalis* (Walker, 1862) and *Trilocha varians* (Moore, 1855)), two Endromidae (*Mustilizans hepatica* (Moore, 1879) and *Comparmustilia sphingiformis* (Moore, 1879)), three Saturniidae (*Saturnia cidosa* Moore, 1865, *Loepa sikkima* (Moore, [1866]), and *Salassa thespis* (Leech, 1890)), and seven Sphingidae (*Rhodoprasina floralis* (Butler, 1876), *Amplypterus masoni masoni* (Clark, 1924), *Acosmerycoides harterti* (Rothschild, 1895), *Hippotion celerio* (Linnaeus, 1758), *Theretra tibetiana* Vaglia & Haxaire, 2010, *T. silhetensis silhetensis* (Walker, 1856), and *Cechenena helops helops* (Walker, 1856)).

In the present survey, we covered only a small area in central and southern Bhutan. The earlier studies of Dudgeon (1898a,b) reported on just the lower elevations of the Bhutan Himalaya, and the Swiss expedition team of the Natural History Museum, Basel, visited only the eastern part of Bhutan in 1972 (Dierl 1975). Thus, a vast area of eastern Bhutan, which is known to be very rich in butterfly species (Wangdi et al. 2012) is unstudied. Irungbam & Kitching (2014) reported 27 species of Sphingidae from Tsirang District of southern Bhutan and reported *Clanis hyperion* for the first time from Bhutan. Later, Geilis & Wangdi (2017), who conducted surveys in many parts of Bhutan, produced an updated list of 107 species of Bombycoidea consisting of two taxa of Brahmaeidae, two taxa of Endromidae, seven taxa of Eupterotidae, 33 taxa of Saturniidae, and 63 taxa of Sphingidae. Surveys in other parts of Bhutan are therefore expected to add more species, and a systematic investigation in all parts of Bhutan is recommended to understand the complete fauna of the country's bombycoid moths.

Taxonomic list

Species reported from Bhutan for the first time are marked by an asterisk (*).

Superfamily Bombycoidea Latreille, 1802

Family Bombycidae Latreille, 1802

The recorded global distributions of species of Bombycidae were extracted from Hampson (1892 [1893]), Dudgeon (1898a), Dierl (1975), Kishida (1994b), Chu & Wang 1996, Kendrick (2002), Zolotuhin & Witt (2009), Wang et al. (2015), Geilis & Wangdi (2017), Kitching et al. (2018), Sanyal et al. (2018), and Nakao (2019).

Subfamily Bombycinae Latreille, 1802

Genus *Bombyx* Linnaeus, 1758

1. *Bombyx huttoni* Westwood, 1847 (Image 1A)

Material examined: BM-214, 1 male, 07.x.2013, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; BM-682, 1 male, 2.ix.2014, Damphu (Tsirang), 27.072°N and 90.109°E, 1,058m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Trongsa, and Sarpang), Pakistan, India, Nepal, China, Taiwan, Thailand, Vietnam, and Malaysia.

Genus *Penicillifera* Dierl, 1978

2. *Penicillifera apicalis* (Walker, 1862) * (Image 1B)

Material examined: 1 male (image record), 20.iv.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m (Image by J.S. Irungbam).

Distribution: Bhutan (Tsirang), India, China, Hongkong, Hainan Island, Philippines, Indonesia, Malaysia, Vietnam, and Thailand.

Remarks: A new country record for Bhutan.

Genus *Trilocha* Moore, [1860]

3. *Trilocha varians* (Moore, 1855) * (Image 1C)

Material examined: 1 male (image record), 20.v.2012,

Table 1. Summary of the Bombycoidea fauna of Bhutan based on old literature records and specimens collected during the study period.

	Family	Species recorded in the present study	Old records	New country records	Total species
1	Bombycidae	3	1	2	3
2	Brahmaeidae	2	2	0	2
3	Endromidae	2	2	2	4
4	Eupterotidae	5	12	0	12
5	Saturniidae	27	34	3	37
6	Sphingidae	60	86	7	93
Grand Total		109	137	14	151

Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m (Image by J.S. Irungbam).

Distribution: Bhutan (Tsirang and Trashigang), Nepal, India including the Andaman Islands, Sri Lanka, China, Taiwan and Hainan Islands, Hong Kong, southern Japan, Philippines, Malaysia, Indonesia, Vietnam, and Thailand.

Remarks: A new country record for Bhutan.

Family Brahmaeidae Swinhoe, 1892

The recorded global distributions of species of Brahmaeidae were extracted from Hampson (1892), Holloway (1987), Nässig (1994b), Kendrick (2002), Brechlin (2009a), Kaleka et al. (2017), Geilis & Wangdi (2017), Kitching et al. (2018), Sanyal et al. (2018), and Nakao (2019).

Genus *Brahmaea* Walker, 1855

4. *Brahmaea wallichii wallichii* (Gray, 1831) (Image 1D)

Material examined: BM-573, 1 male, 09.v.2014 Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; BM-702, 1 female, 24.vi.2015, Bhutan, Damphu (Tsirang), 27.072°N and 90.109°E, 1,058m, coll. M.J. Irungbam

Distribution: Bhutan (Tsirang, Thimphu, Pemagatshel, Chukha, Bumthang, Trashigang, and Samdrup Jongkhar), Nepal, northern India, Myanmar, China, Japan, northern Vietnam, Thailand, Laos, Taiwan, and Sundaland.

5. *Brahmaea hearseyi* White, 1862 (Image 1E)

Material examined: BM-571, 1 female, 22.v.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; BM-572, 1 male, 24.vi.2015, Bhutan, Damphu (Tsirang), 27.072°N and 90.109°E, 1,058m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Trashigang, and Pemagatshel), Nepal, northeastern India, Myanmar, southwestern China, Thailand, Laos, Cambodia, Vietnam, and Sundaland.

Family Endromidae Boisduval, 1828

The recorded global distributions of species of Endromidae were extracted from Hampson (1892), Dudgeon (1898a), Dierl (1975), Wang et al. (2015), Geilis & Wangdi (2017), Kitching et al. (2018), Sanyal et al. (2018), and Nakao (2019).

Genus *Mustilizans* Yang, 1995

6. *Mustilizans hepatica* (Moore, 1879) * (Image 1F)

Material examined: BM-213, BM-674, 2 males,

03.x.2012, 20.iv.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang and Trashiyangtse), Pakistan, Nepal, northeastern India, China, Hainan, northern Vietnam, northern Malaysia, Laos, and northern Thailand.

Remarks: A new country record for Bhutan. Wang et al. (2015) transferred the species from the genus *Mustilia* to *Mustilizans*.

Genus *Comparmustilia* Wang & Zolotuhin, 2015

7. *Comparmustilia sphingiformis* (Moore, 1879) * (Image 1G)

Material examined: BM-215, BM-728, 2 males, 08.viii.2013, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang) Nepal, India, Myanmar, China, Taiwan, northern Thailand, northern Vietnam, and northern Malaysia.

Remarks: A new country record for Bhutan. Wang et al. (2015) transferred the species from the genus *Mustilia* to *Comparmustilia*.

Genus *Mustilia* Walker, 1865

8. *Mustilia falcipennis* Walker, 1865

Material examined: None.

Distribution: Bhutan (Thimphu), Nepal, India, China, Hainan, Sumatra, and Java.

Remarks: This species was not recorded in the study.

9. *Mustilia castanea* Moore, 1879

Material examined: None.

Distribution: Bhutan (Thimphu), Nepal, India, and China.

Remarks: This species was not recorded in the study.

Family Eupterotidae Swinhoe, 1892

The recorded global distributions of species of Eupterotidae were extracted from Hampson (1892), Dudgeon 1898a, Dierl (1975), Kishida (1994a), Kendrick (2002), Nässig & Oberprieler (2008), Geilis & Wangdi (2017), Savelle (2018), Kitching et al. (2018), Sanyal et al. (2018), Zolotuhin (2018), and Nakao (2019).

Subfamily Eupterotinae Swinhoe, 1892

Genus *Eupterote* Hübner, [1820]

10. *Eupterote* cf. *fabia* (Cramer, [1779]) (Image 1H)

Material examined: BM-589, BM-745, 2 males, 20.iv.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; BM-746, 1 male, 08.viii.2013, Bhutan, Dagapela (Dagana), 26.941°N

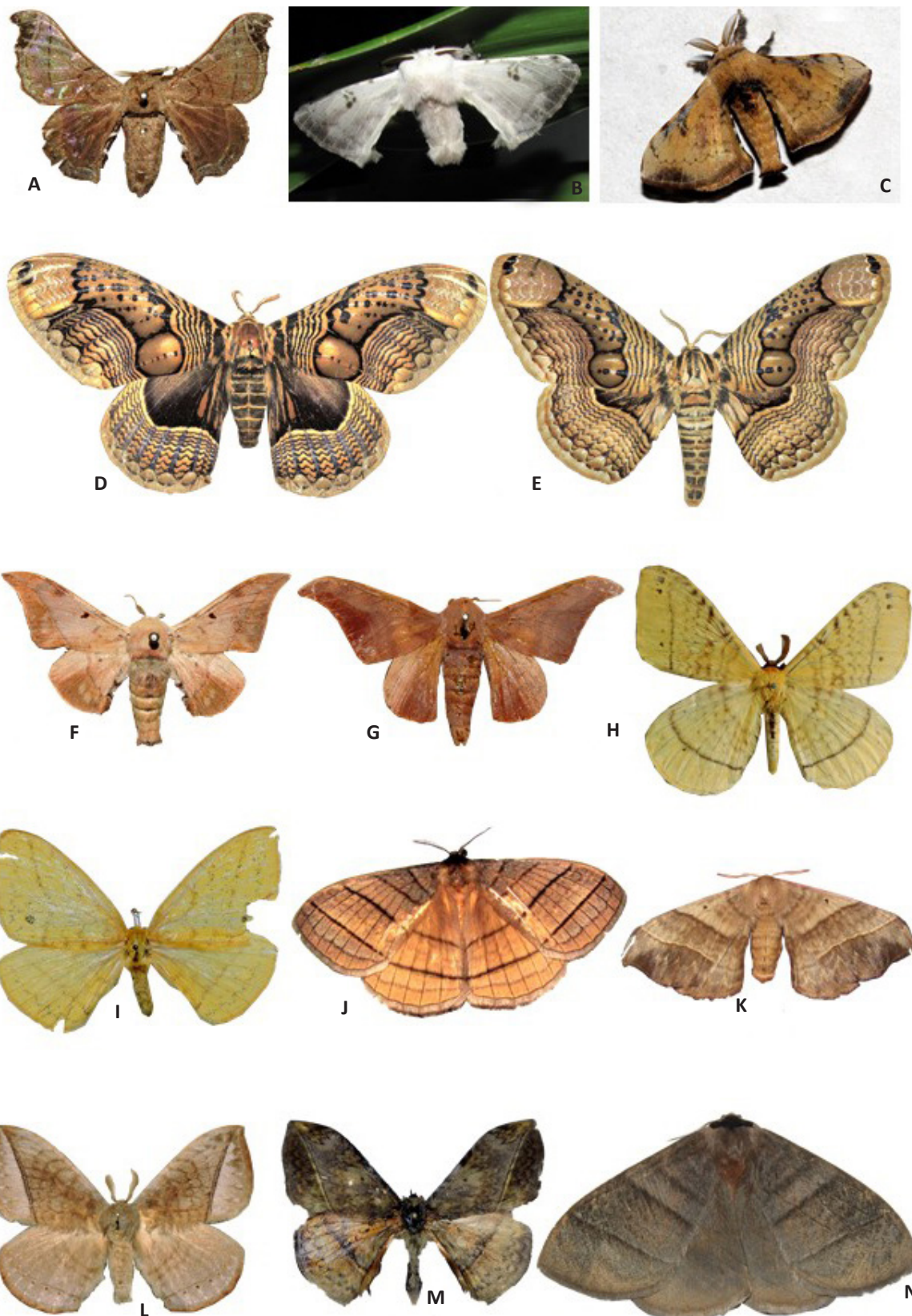


Image 1. A - *Bombyx huttoni* Westwood, 1847 | B - *Penicillifera apicalis* (Walker, 1862)* | C - *Trilocha varians* (Moore, 1855)* | D - *Brahmaea wallichii wallichii* (Gray, 1831) | E - *B. hearseyi* White, 1862 | F - *Mustilizans hepatica* (Moore, 1879)* | G - *Comparmustilia sphingiformis* (Moore, 1879)* | H - *Eupterote cf. fabia* (Cramer, [1779]) | I - *E. cf. lineosa* | J - *Palirisa lineosa* (Walker, 1855) | K - *Apona cashmirensis* (Kollar, [1844]) | L - *Ganisa similis* Moore, 1884 | M - *Pseudojana incandescens* (Walker, 1855). Species marked with "*" incates new record to Bhutan.

and 89.923°E, 1,576m, coll. J.S. Irungbam; BM-658, 1 male, 12.x.2014, Bhutan, Jakar (Bumthang), 27.545°N and 90.725°E, 2,884m, coll. J.S. Irungbam

Distribution: Bhutan (Dagana and Bumthang), India, and Sri Lanka.

11. *Eupterote cf. lineosa* (Walker, 1855) (Image 1I)

Material examined: BM-589, 1 male, 20.iv.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. M.J. Irungbam; BM-590, IJ-413, 2 males, 18.v.2015, Bhutan, Dagapela (Dagana), 26.941°N and 89.923°E, 1,576m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang and Dagana) and Nepal.

12. *Eupterote glaucescens* (Walker, 1855)

Material examined: None.

Distribution: Bhutan (Wangdue Phodrang), Nepal, and India.

Remarks: This species was not recorded in the study.

13. *Eupterote orientalis* (Fabricius, 1793)

Material examined: None.

Distribution: Bhutan, India, and Sri Lanka.

Remarks: This species was not recorded in the study.

The species was previously known as *Eupterote geminata* but this was recently synonymized with *E. orientalis* by Zolotuhin (2018).

14. *Eupterote undatus* Blanchard, 1853

Material examined: None.

Distribution: Bhutan (Trashiyangtse) Pakistan, India, Nepal, Sri Lanka, Myanmar, Sumatra, Java, and the Philippines.

Remarks: This species was not recorded in the study.

Genus *Palirisa* Moore, 1884

15. *Palirisa lineosa* (Walker, 1855) (Image 1J)

Material examined: 1 male (image record), 7.vi.2013, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m (Image by M.J. Irungbam); 1 female (image record), 19.vii.2014, Dagapela (Dagana), 26.941°N and 89.922°E, 1,576m (Image by J.S. Irungbam).

Distribution: Bhutan (Tsirang and Dagana), Nepal, India, and Bangladesh.

“Ganisa-group”

Genus *Apona* Walker, 1856

16. *Apona cashmirensis* (Kollar, [1844]) (Image 1K)

Material examined: 1 male (image record), 04.iii.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m (Image by J.S. Irungbam).

Distribution: Bhutan (Tsirang), northern India, and Nepal.

Genus *Ganisa* Walker, 1855

17. *Ganisa similis* Moore, 1884 (Image 1L)

Material examined: BM-210, BM-211, BM-212, 3 males, 08.viii.2013, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. M.J. Irungbam

Distribution: Bhutan (Tsirang and Zhemgang), Nepal, India, China, and Sundaland.

18. *Ganisa postica* Walker, 1855

Material examined: None.

Distribution: Bhutan (Thimphu and Wangdue Phodrang), northeastern India, Bangladesh, and Sri Lanka.

Remarks: This species was not recorded in the study.

19. *Ganisa pandya* (Moore, 1865)

Material examined: None.

Distribution: Bhutan, India, Bangladesh, China, and Hong Kong.

Remarks: This species was not recorded in the study.

Genus *Apha* Walker, 1855

20. *Apha subdives* Walker, 1855 (Image 1M)

Material examined: IJ-425, IJ-426, 2 males, 5.vii.2014, Bhutan, Daga (Dagana), 27.032°N and 89.489°E, 1,576m, coll. J.S. Irungbam & M.J. Irungbam

Distribution: Bhutan (Dagana and Wangdue Phodrang), northeastern India, Bangladesh, Myanmar, Thailand, Vietnam, and China.

Remarks: This species was not recorded in the study.

Genus *Pseudojana* Hampson, [1892]

21. *Pseudojana incandescens* (Walker, 1855) (Image 1N)

Material examined: 1 male (image record), 09.iv.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, (Image by J.S. Irungbam); BM-616, 1 male, 14.v.2015, Bhutan, Khuri (Lhuntse), 27.675°N and 91.178°E, 1,780m, coll. J.S. Irungbam & M.J. Irungbam

Distribution: Bhutan (Tsirang, Trongsa, and Lhuentse), Nepal, and northeastern India.

Family Saturniidae Boisduval, [1837]

The recorded global distributions of species of Saturniidae were extracted from Hampson (1892), Dudgeon (1898a), Arora & Gupta (1979), Nardelli (1986), Holloway (1987), Peigler (1989), Pinratana & Lampe (1990), Haruta (1992b), Nässig (1994a, 1994b.), Chu

& Wang (1996), Nässig & Treadaway (1998), Kendrick (2002), Nässig (2002), Gupta (2003), Peigler & Naumann (2003), Tikader et al. (2014), Witt & Pugaev (2007), Naumann et al. (2008), Racheli (2008), Brechlin (2009a), Nässig et al. (2010), Naumann & Nässig (2010a, 2010b), Naumann & Löffler (2012, 2013), Gogoi et al. (2014), Geilis & Wangdi (2017), Kitching et al. (2018), Paukstadt & Paukstadt (2018), Sanyal et al. (2018), and Nakao (2019).

Subfamily Saturniinae Boisduval, [1837]

Genus *Attacus* Linnaeus, 1767

22. *Attacus atlas atlas* (Linnaeus, 1758) (Image 2A)

Material examined: BM-618, 1 female, 09.vi.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Zhemgang, and Pemagatshel), India, Myanmar, China, Cambodia, Laos, Taiwan, Hong Kong, Borneo, Sumatra, Java, Bali, the Philippines, New Guinea, and The Moluccas.

Genus *Archaeoattacus* Watson in Packard, 1914

23. *Archaeoattacus edwardsii* (White, 1859) (Image 2B)

Material examined: BM-627, 1 male, 17.ix.2012, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Bumthang, Mongar, Thimphu, Chukha, and Punakha), northern India, Nepal, Myanmar, China (Tibet), Vietnam and western Malaysia.

Genus *Samia* Hübner, [1819]

Samia canningi (Hutton, 1859) (Image 2C)

Material examined: BM-581, BM-631, BM-632, BM-633, 2 females, 2 males, 27.v.2012, 21.ix.2012, 22.vii.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam; BM-635, BM-636, 2 females, 22.viii.2014, Bhutan, Sarpang Tar (Sarpang), Tsirang-Sarpang-Gelephu Highway, 26.897°N and 90.212°E, 829m, coll. J.S. Irungbam & M.J. Irungbam

Distribution: Bhutan (Tsirang, Punakha, Sarpang, Gelephu, Chukha, Phuentsholing, Mongar, Trashigang and Zhemgang), Pakistan, northern and northeastern India, Nepal, Myanmar, Thailand, Cambodia, Laos, Vietnam, and southern China.

Genus *Rhodinia* Staudinger, 1892

24. *Rhodinia newara* (Moore, 1872) (Image 2D)

Material examined: 1 female (image record), 16.xi.2014, Bhutan, Tingtibi (Zhemgang), Sarpang-Gelephu-Trongsa Highway, 27.142°N and 90.690°E,

575m (Image by W. Kezang).

Distribution: Bhutan (Bumthang, Mongar, Zhemgang, and Lhuentse), Nepal, northern India, Bangladesh, northern Myanmar, northern Thailand, northern Vietnam, and southwestern China.

Genus *Actias* Leach, 1815

25. *Actias selene selene* (Hübner, 1806) (Image 2E,F)

Material examined: BM-579, BM-580, BM-642, BM-643, 2 females, 2 males, 31.x.2013, 23.viii.2014, 12.iv.2015, 20.iv.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam; BM-646, 1 female, 22.viii.2014, Bhutan, Sarpang Tar (Sarpang), Tsirang-Sarpang-Gelephu Highway, 26.897°N and 90.212°E, 829m, coll. J.S. Irungbam; BM-645, 1 male, 5.vii.2014, Bhutan, Langthel (Trongsa), Sarpang-Gelephu-Trongsa Highway, 27.455°N and 90.489°E, 1,924m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Trongsa, Thimphu, Sarpang, Paro, Chukha, Samtse, Luentse, and Trashiyangtse), Afghanistan, Pakistan, Nepal, western and northeastern India, Bangladesh, northern Thailand, Vietnam, China, Korea and the Philippines.

26. *Actias parasinensis* Brechlin, 2009 (Image 3A,B)

Material examined: BM-576, BM-577, BM-578, 2 females, 1 male, 23.viii.2014, 12.iv.2015, 20.iv.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam; BM-639, 1 female, 22.viii.2014, Bhutan, Sarpang Tar (Sarpang), Tsirang-Sarpang-Gelephu Highway, 26.897°N and 90.212°E, 829m, coll. J.S. Irungbam & Rinchen K.; BM-649, BM-652, 1 male, 1 female, 12.ix.2013, 5.vii.2014, Bhutan, Daga (Dagana), 27.032°N and 89.887°E, 1,576m, coll. J.S. Irungbam.

Distribution: Bhutan (Tsirang, Dagana, Sarpang, Chukha, Thimphu, Zhemgang, and Trongsa), northern India, Thailand, Laos, and Vietnam.

27. *Actias maenas maenas* Doubleday, 1847 (Image 3 C)

Material examined: BM-575, IJ-234, 1 male, 1 female, 23.viii.2014, 20.iv.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam; IJ-240, 1 female, 20.ix.2013, Bhutan, Sarpang Tar (Sarpang), Tsirang-Sarpang-Gelephu Highway, 26.897°N and 90.212°E, 829m, coll. J.S. Irungbam; BM-654, 1 male, 5.vii.2014, Bhutan, Daga (Dagana), 27.032°N and 89.489°E, 1,576m, coll. J.S. Irungbam.

Distribution: Bhutan (Tsirang, Sarpang, Dagana, Paro,

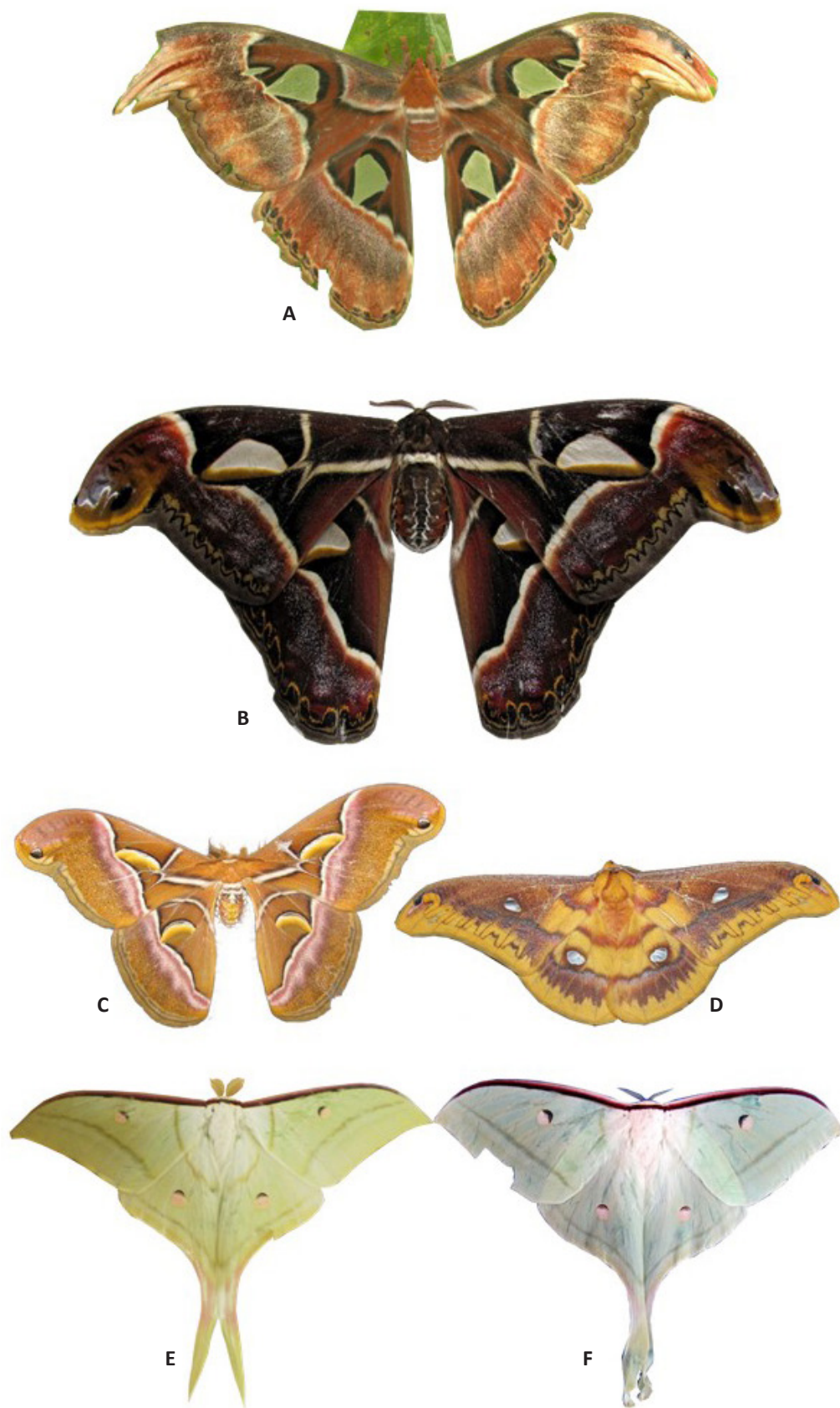


Image 2. A - *Attacus atlas atlas* (Linnaeus, 1758) | B - *Archaeoattacus edwardsii* (White, 1859) | C - *Samia canningii* (Hutton, 1859) | D - *Rhodinia newara* (Moore, 1872) | E - female of *A. selene selene*, Hübner, 1806 | F - male of *A. selene selene* Hübner, 1806.

Samtse, Samdrup Jongkhar, Mongar, Bumthang, and Trashiyangtse), Nepal, India, Bangladesh, southwestern China, northern Thailand, Laos, and Vietnam.

Genus *Saturnia* Schrank, 1802

28. *Saturnia (Rinaca) zuleika* Hope, 1843 (Image 3D)

Material examined: IJ-658, 1 female, 12.ix.2013, Bhutan, Langthel (Trongsa), Sarpang-Gelephu-Trongsa Highway, 27.455°N and 90.489°E, 1,924m, coll. J.S. Irungbam & K. Rinchen.

Distribution: Bhutan (Trongsa, Thimphu, Trashigang, and Trashiyangtse), Nepal, northern India, Myanmar, southwestern China, northern Thailand, Laos, and northern Vietnam.

29. *Saturnia (Rinaca) simla* Westwood, 1847 (Image 3E)

Material examined: 1 female (image record), 16.xi.2014, Bhutan, Tingtibi (Zhemgang), Sarpang-Gelephu-Trongsa Highway, 27.142°N and 90.690°E, 575m (Image by Rinchen K).

Distribution: Bhutan (Zhemgang and Trashigang), Pakistan, India, Nepal, Myanmar, China, Thailand, Laos, and Vietnam.

30. *Saturnia (Rinaca) thibeta* (Westwood, 1853) (Image 3 F)

Material examined: BM-159, IJ-549, 2 females, 17.xii.2012, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam

Distribution: Bhutan (Tsirang, Zhemgang, Trashiyangtse, Chukha, and Phuentsholing), India, Nepal, Vietnam, China, Thailand, Malaysia, and Taiwan.

31. *Saturnia (Rinaca) anna* Moore, [1866] (Image 3G)

Material examined: 1 male (image record), 29.iv.2014, Bhutan, Langthel (Trongsa), Sarpang-Gelephu-Trongsa Highway, 27.455°N and 90.489°E, 1,924m (Image by K. Rinchen).

Distribution: Bhutan (Thimphu, Trongsa, and Trashiyangtse), northern India, Nepal, China, and Vietnam.

32. *Saturnia (Rinaca) bonita* (Jordan, 1911)

Material examined: None.

Distribution: Bhutan (Thimphu and Paro), Nepal, northeastern India, and Tibet (China).

Remarks: This species was not recorded in the study.

33. *Saturnia (Rinaca) witti* Brechlin, 1997

Material examined: None.

Distribution: Bhutan (Trongsa) and Nepal.

Remarks: This species was not recorded in the study.

34. *Saturnia (Rinaca) cidosa* Moore, 1865* (Image 3H, I)

Material examined: BM-591, BM-592, BM-593, BM-594, 2 females, 2 males, 21.ii.2012, 02.iii.2014, 08.iii.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam; BM-595, BM-596, 2 males, 23.iii.2015, Bhutan, Dagapela (Dagana), 26.941°N and 89.922°E, 1,576m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Dagana, Zhemgang, Trongsa, and Samdrup Jongkhar), northeastern India, and Nepal.

Remarks: A new country record for Bhutan. Brechlin (2009a) expected the species to be present in Bhutan, but it was not recorded in his study.

35. *Saturnia (Rinaca) pelelaensis* Brechlin, 2009c

Material examined: None.

Distribution: Bhutan (Trongsa).

Remarks: This species was not recorded in the study.

Genus *Loepa* Moore, [1860]

36. *Loepa miranda* Atkinson in Moore, 1865 (Image 4A)

Material examined: 1 male (image record), 15.viii.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m (Image by J.S. Irungbam).

Distribution: Bhutan (Tsirang, Paro, Thimphu, and Trongsa), Nepal, northern India, northern Myanmar, southwestern China, Thailand, Laos, and Vietnam.

37. *Loepa diffundata* Naumann, Nässig & Löffler, 2008

Material examined: None.

Distribution: Bhutan (Mongar), Nepal, northern India, Myanmar, southwestern China, Thailand, Laos, Cambodia, and Vietnam.

Remarks: This species was not recorded in the study.

38. *Loepa sikkima* (Moore, [1866]) * (Image 4B)

Material examined: IJ-344, 2 males, 23.viii.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang), northern India, Nepal, Myanmar, Hong Kong, Thailand, Malaysia, Sumatra, Java, and Sundaland.

Remarks: A new country record for Bhutan.

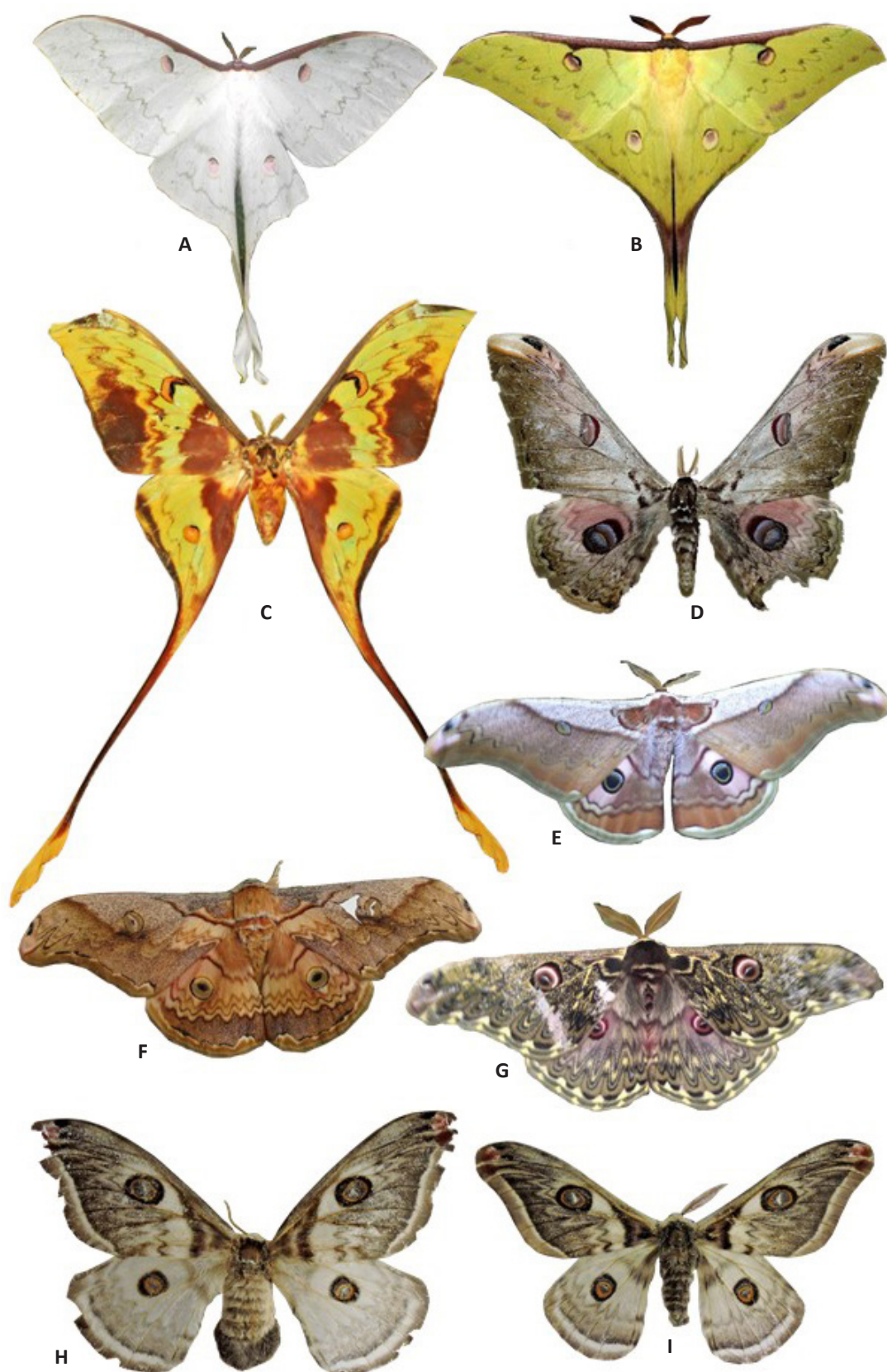


Image 3. A - Female of *A. parasinensis* Brechlin, 2009 | B - male of *A. parasinensis* Brechlin, 2009 | C - *Actias maenas maenas* Doubleday, 1847 | D - *Saturnia (Rinaca) zuleika* Hope, 1843 | E - *S. (R.) simla* Westwood, 1847 | F - *S. (R.) thibeta* Westwood, 1853 | G - *S. (R.) anna* Moore, [1866] | H - female of *S. (R.) cidosa* Moore, 1865* | I - male of *S. (R.) cidosa* Moore, 1865*. Species marked with "*" incates new record to Bhutan.

39. *Loepa diffunoccidentalis* Brechlin, 2010a (Image 4C)

Material examined: BM-587, 1 male, 05.iii.2013, 13.iii.2013, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam

Distribution: Bhutan (Tsirang, Trashigang, Trashiyangtse, and Punakha) and Myanmar.

40. *Loepa katinka* (Westwood, 1847) (Image 4D)

Material examined: BM-588, IJ-345, 2 males, 14.iv.2012, 23.viii.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang and Zhemgang), Nepal, northeastern India, Myanmar, China, Hong Kong, and Vietnam.

41. *Loepa bhutanensis* Naumann & Löffler, 2012

Material examined: None.

Distribution: Bhutan (Thimphu and Punakha).

Remarks: This species was not recorded in the study.

Genus *Cricula* Walker, 1855

42. *Cricula trifenestrata trifenestrata* (Helfer, 1837) (Image 4E)

Material examined: BM-582, BM-583, IJ-201, females, 1 male, 06.vi.2012, 31.x.2013, 23.viii.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam; BM-281, IJ-205, IJ-206, 2 females, 1 male, 12.ix.2013, 5.vii.2014, Bhutan, Daga (Dagana), 27.032°N and 89.887°E, 1,576m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Dagana, Chukha, and Zhemgang), India, Nepal, Sri Lanka, China, Tibet, Thailand, Cambodia, Laos, Vietnam, and The Philippines.

43. *Cricula andrei* Jordan, 1909 (Image 4F)

Material examined: BM-584, IJ-204, 2 males, 31.x.2013, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, and Trashigang), northeastern India, China (Tibet), Myanmar, Vietnam, Thailand, and Indonesia.

Genus *Antheraea* Hübner, [1819]

44. *Antheraea (Antheraeopsis) assamensis* Helfer, 1837 (Image 4G)

Material examined: BM-585, 1 female, 31.x.2013, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; BM-666, 1 male, 5.vii.2014, Bhutan, Daga (Dagana), 27.032°N and 89.887°E, 1,576m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang and Dagana), northern India, Nepal, Myanmar, Thailand, Laos, and Vietnam.

45. *Antheraea (Antheraeopsis) castanea* Jordan, 1910

Material examined: None.

Distribution: Bhutan (Trashigang), northeastern India, Myanmar, Laos, and Sundaland.

Remarks: This species was not recorded in the study.

46. *Antheraea (Antheraea) frithi frithi* Moore, 1858 (Image 4H)

Material examined: 1 male (image record), 12.ix.2013, Bhutan, Langthel (Trongsa), Sarpang-Gelephu-Trongsa Highway, 27.456°N and 90.489°E, 1,165m (Image by D. Sonam).

Distribution: Bhutan (Trongsa, Paro, Haa, Thimphu, and Trashiyangtse), northern India, Nepal, Thailand, Laos, Cambodia, Vietnam, Myanmar, and southwestern China.

47. *Antheraea (Antheraea) rubicunda* Brechlin, 2009 (Image 4I)

Material examined: 1 male (image record), 20.ix.2012, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m (Image by J.S. Irungbam).

Distribution: Bhutan (Tsirang and Trongsa), Nepal, and northeastern India.

48. *Antheraea (Antheraea) roylei* Moore, 1858 (Image 4J)

Material examined: BM-586, 1 male, 20.ix.2012, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Chukha, and Zhemgang), northern India, Nepal, Myanmar, southwestern China, Thailand, Cambodia, Laos, and Vietnam.

49. *Antheraea (Antheraea) helferi* Moore, 1858 (Image 5A)

Material examined: 1 male (image record), 01.iii.2012, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m (Image by J.S. Irungbam).

Distribution: Bhutan (Tsirang, Chukha, and Trashigang), northern India, Myanmar, Thailand, Laos, Vietnam, and southwestern China.

Subfamily Salassinae Michener, 1949

Genus *Salassa* Moore, 1859

50. *Salassa mesosa mesosa* Jordan, 1910

Material examined: None.



Image 4. A - *Loepa miranda* Moore, 1865 | B - *L. sikkima* (Moore, [1866])* | C - *L. diffunoccidentalis* Brechlin, 2010a | D - *L. katinka* (Westwood, 1847) | E - *Cricula trifenestrata trifenestrata* (Helfer, 1837) | F - *C. andrei* Jordan, 1909 | G - *Antheraea (Antheraeopsis) assamensis* Helfer, 1837 | H - *A. (Antheraea) frithi frithi* Moore, 1859 | I - *A. (Antheraea) rubicunda* Brechlin, 2009 | J - *A. (Antheraea) roylei* Moore, 1858. Species marked with "*" incates new record to Bhutan.

Distribution: Bhutan (Monger), northeastern India, and Myanmar.

Remarks: This species was not recorded in the study.

51. *Salassa lola* (Westwood, 1847) (Image 5B)

Material examined: 1 male (image record), 04.vi.2015, Bhutan, Chendebji (Trongsa), Thimphu-Trongsa-Bumthang Highway, 27.474°N and 90.349°E, 2,451m (Image by Kezang W.).

Distribution: Bhutan (Trongsa), Nepal, northern and northeastern India, and Bangladesh.

52. *Salassa bhutanensis* Brechlin, 2009c (Image 5C)

Material examined: 1 male (image record), 04.vi.2015, Bhutan, Thimphu (Hongtsho), Thimphu-Punakha Highway, 27.490°N and 89.748°E, 3,040m (Image by Sonam D.); 1 male (image record), 07.v.2015, Bhutan, Bumthang (Jakar), Lamaigoenpa, 27.545°N and 90.723°E, 2,650m (Image by Yeshe T.D.).

Distribution: Bhutan (Thimphu, Trongsa, and Bumthang).

53. *Salassa belinda* Witt & Pugaev, 2007 (Image 5D)

Material examined: 1 male (image record), 04.vi.2015, Bhutan, Chendebji (Trongsa), Thimphu-Trongsa-Bumthang Highway, 27.474°N and 90.349°E, 2,451m (Image by Kezang W.); 1 male (image record), 07.v.2015, Bhutan, Bumthang (Jakar), Lamaigoenpa, 27.545°N and 90.723°E, 2,650m (Image by Sonam D.).

Distribution: Bhutan (Thimphu, Bumthang, and Trongsa) and eastern Nepal.

54. *Salassa royi* (Elwes, 1887)

Material examined: None.

Distribution: Bhutan, northeastern India, and Nepal.

Remarks: This species was not recorded in the study.

55. *Salassa thespis* (Leech, 1890) * (Image 5E)

Material examined: 1 male (image record), 04.vi.2015, Bhutan, Chendebji (Trongsa), Thimphu-Trongsa-Bumthang Highway, 27.474°N and 90.349°E, 2,451m (Image by Kezang W.).

Distribution: Bhutan (Trongsa and Zhemgang), Myanmar, Thailand, and China.

Remarks: A new country record for Bhutan.

56. *Salassa pararoyi* Brechlin, 2009c.

Material examined: None.

Distribution: Bhutan (Thimphu) and western Bhutan.

Remarks: This species was not recorded in the study.

57. *Salassa iris* Jordan, 1910

Material examined: None.

Distribution: Bhutan (Trashigang) and northern India (Sikkim).

Family Sphingidae Latreille, 1802

The recorded global distributions of species of Sphingidae were extracted from Bell & Scott (1937), Ebert (1969), Eichler (1971), d'Abrera (1986 [1987]), Holloway (1987), Pittaway (1993), Haruta (1992), Smetacek (1994), Kitching & Spitzer (1995), Inoue et al. (1997), Brechlin (1997, 2009a,b,c,d, 2010a,b, 2014a,b,c, 2015), Danner et al. (1998), Hogenes & Treadaway (1998), Kitching & Cadiou (2000), Zwick & Treadaway (2001), Kendrick (2002), Schnitzler & Stünning (2009), Eitschberger & Melichar (2010), Vaglia et al. (2010), Eitschberger & Nguyen (2012), Pathania et al. (2014), Rafi et al. (2014), Singh & Kitching (2014), Haxaire et al. (2017), Yakovlev & Doroshkin (2017), Pittaway & Kitching (2000; 2019), Kitching (2018), Ivshin et al. (2018), Sanyal et al. (2018), Nakao (2019), Jamtsho & Irungbam (2019), and Irungbam & Norbu (2019).

Subfamily Sphinginae Latreille, 1802

Genus *Acherontia* Laspeyres, 1809

58. *Acherontia lachesis* (Fabricius, 1798) (Image 5F)

Materials examined: BM-088, BM-089, BM-753, 2 males, 1 female, 10.iv.2014, 07.viii.2014, 18.ix.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam; BM-750, BM-751, 2 males, 21.iii.2014, 20.iv.2014, Bhutan, Dagana (Dagana), 27.032°N and 89.887°E, 1,580m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Dagana, Chukha, Haa, Zhemgang, and Samdrup Jongkhar), eastern Pakistan, India, Sri Lanka, Nepal, Myanmar, China, Hong Kong, southern Japan, Thailand, Laos, Vietnam, Malaysia, The Philippines, and Indonesia to Papua New Guinea.

59. *Acherontia styx* (Westwood, 1848) (Image 5G)

Materials examined: BM-090, BM-762, 2 males, 11.viii.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam

Distribution: Bhutan (Tsirang, Dagana, and Pemagatshel), Pakistan, Nepal, India, Bangladesh, Myanmar, China, northern Thailand, Iran to Saudi Arabia, and Iraq.



Image 5. A - *Antheraea (Antheraea) helferi* Moore, 1858 | B - *Salassa lola* (Westwood, 1847) | C - *S. bhutanensis* Brechlin, 2009 | D - *S. belinda* Witt & Pugaev, 2007 | E - *S. thespis* (Leech, 1890)* | F - *Acherontia lachesis* (Fabricius, 1798) | G - *A. styx* (Westwood, 1848) | H - *Agrius convolvuli* (Linnaeus, 1758) | I - *Apocalypsis velox velox* (Butler, 1876) | J - *Psilogramma increta* (Walker, 1865) | K - *P. discistriga discistriga* (Walker, 1856). Species marked with "*" incates new record to Bhutan.

Genus *Agrius* Hübner, [1819]

60. *Agrius convolvuli* (Linnaeus, 1758) (Image 5H)

Materials examined: BM-99, BM-100, BM-101, BM-102, BM-108, BM-110, 6 males, 26.ix.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Wangdue Phodrang, Trongsa, Phuentsholing, and Thimphu), Pakistan, India, Sri Lanka, Myanmar, China, Hong Kong, Malaysia, Indonesia, Africa, Australia, the Pacific, and southern Europe. Migratory in Mongolia, Siberia, and Japan.

Genus *Apocalypsis* Rothschild & Jordan, 1903

61. *Apocalypsis velox velox* (Butler, 1876) (Image 5I)

Materials examined: BM-086, BM-087, 2 males, 18.vi.2014, 20.v.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; BM-689, 1 male, 23.vi.2015, Bhutan, Dagapela (Dagana), 26.941°N and 89.922°E, 1,576m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang and Dagana), northeastern India, southwestern China, and northern Vietnam.

Genus *Psilogramma* Rothschild & Jordan, 1903

62. *Psilogramma increta* (Walker, 1865) (Image 5J)

Materials examined: BM-92, BM-93, 2 males, 13.v.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Wangdue Phodrang, and Trashigang), northern Pakistan, northwestern India, Nepal, Myanmar, Thailand, Laos, Vietnam, Taiwan, Hong Kong, eastern China to Korea, and Japan.

63. *Psilogramma discistriga discistriga* (Walker, 1856) (Image 5K)

Materials examined: BM-94, 1 male, 3.iv.2013, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; BM-111, BM-112, 2 males, 21.iii.2014, 20.iv.2014, Dagana (Dagana), 27.032°N and 89.887°E, 1,580m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Samdrup Jongkhar, and Zhemgang), northern and northeastern India, Nepal, China, Hong Kong, Taiwan, Thailand, Laos, Vietnam, Indonesia, and The Philippines.

Genus *Sphinx* Linnaeus, 1758

64. *Sphinx bhutana* Brechlin, 2015

Materials examined: None.

Distribution: Bhutan (Paro).

Remarks: This species was not recorded in the study.

65. *Sphinx oberthueri* (Rothschild & Jordan, 1903)

Materials examined: None.

Distribution: Bhutan (Thimphu) and central and southwestern China to northern Thailand.

Remarks: This species was not recorded in the study. Recorded from Bhutan by Dierl (1975) as *Hyloicus oberthueri*.

Genus *Pseudodolbina* Rothschild, 1894

66. *Pseudodolbina fo fo* (Walker, 1856)

Materials examined: None.

Distribution: Bhutan, Nepal, northeastern India, Tibet, and China.

Remarks: This species was not recorded in the study.

Genus *Dolbina* Staudinger, 1877

67. *Dolbina inexacta* (Walker, 1856) (Image 6A)

Materials examined: BM-73, BM-74, 2 males, 29.iv.2013, 11.iv.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; BM-322, 1 female, 20.ix.2014, Bhutan, Sarpang Tar (Sarpang), Tsirang-Sarpang-Gelephu Highway, 26.897°N and 90.212°E, 829m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang and Sarpang), Pakistan, northern and central India, Nepal, Myanmar, Thailand, southern China, and Taiwan.

Subfamily Smerinthinae Grote & Robinson, 1865**Genus *Marumba* Moore, [1882]**

68. *Marumba cristata cristata* (Butler, 1875) (Image 6B)

Materials examined: BM-338, BM-339, 2 males, 29.iv.2013, 20.v.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam; BM-342, 1 male, 18.v.2015, Bhutan, Dagapela (Dagana), 26.941°N and 89.922°E, 1,576m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Dagana, and Sarpang), northeastern India, Thailand, Indo-China, and China.

69. *Marumba dyras dyras* Walker, 1856 (Image 6C)

Materials examined: BM-34, BM-232, BM-270, 2 males, 1 female, 29.iv.2013, 24.v.2013, 20.v.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam; BM-32, BM-33, 2 males, 16.ix.2014, 20.ix.2014, Bhutan, Sarpang Tar (Sarpang), Tsirang-Sarpang-Gelephu Highway, 26.897°N and 90.212°E, 829m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Sarpang, Trongsa, Trashiyangtse and Samdrup Jongkhar), northwestern India, Nepal, Sri Lanka, Andaman & Nicobar Islands,

Myanmar, China, Taiwan, Thailand, Vietnam, Cambodia, Laos, Peninsular Malaysia, Java, Sumatra, and The Philippines.

70. *Marumba sperchius sperchius* (Ménétriés, 1857) (Image 6D)

Materials examined: BM-39, 1 female, 09.v.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang and Zhemgang), northern Pakistan, northern India, Nepal, southwestern, central & eastern China, Taiwan, Russian Far East, North Korea, South Korea, Japan, Thailand, Laos, and northern Vietnam.

71. *Marumba spectabilis spectabilis* Butler, 1875 (Image 6E)

Materials examined: BM-27, BM-192, 2 males, 11.v.2013, 02.ix.2013, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; BM-147, 1 male, 21.iii.2015, Bhutan, Gelephu (Sarpang), 26.897°N and 90.212°E, 829m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang and Gelephu), northeastern India, Nepal, southern China, Thailand, Laos, Vietnam, Malaysia, and Indonesia.

Genus *Polyptychus* Hübner, [1819]

72. *Polyptychus trilineatus trilineatus* Moore, 1888 (Image 6F)

Materials examined: BM-178, BM-200, 2 males, 11.iv.2013, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; BM-30, 1 male, 21.iii.2015, Bhutan, Damphu (Tsirang), 27.072°N and 90.109°E, 1,058m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Trongsa and Trashiyangtse), northern Pakistan, Nepal, northern India, Myanmar, southern China, Thailand, and Vietnam.

73. *Polyptychus dentatus* (Cramer, 1777)

Materials examined: None.

Distribution: Bhutan (Trashigang and Trashiyangtse), Sri Lanka, India, and Pakistan.

Remarks: This species was not recorded in the study.

Genus *Langia* Moore, 1872

74. *Langia zenzeroides zenzeroides* Moore, 1872

Materials examined: None.

Distribution: Bhutan (Trashiyangtse), Pakistan, India, Nepal, eastern and southern China, South Korea, northern Thailand, and Vietnam.

Remarks: This species was not recorded in the study.

Recently recorded from Yangtse Town, Trashiyangtse, eastern Bhutan, by Irungbam & Norbu (2019).

Genus *Rhodoprasina* Rothschild & Jordan, 1903

75. *Rhodoprasina nenulfascia* Zhu & Wang, 1997

Materials examined: None.

Distribution: Bhutan (Mongar), northeastern India (Arunachal Pradesh), and China (Tibet).

Remarks: This species was not recorded in the study. Specimens from Bhutan were described by Brechlin (2010b) as *Rhodoprasina koerferi*, but this taxon was synonymized with *R. nenulfascia* by Řezáč (2018).

76. *Rhodoprasina floralis* (Butler, 1876)* (Image 6G)

Materials examined: 1 male (image record), 11.v.2014, Bhutan, Gelephu (Sarpang), 26.884°N and 90.464°E, 329m (Image by J.S. Irungbam).

Distribution: Bhutan (Gelephu), northern India, and Nepal.

Remarks: A new country record for Bhutan.

Genus *Cypoides* Matsumura, 1921

77. *Cypoides parachinensis* Brechlin, 2009d (Image 6H)

Materials examined: BM-26, 1 male, 11.v.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; BM-25, 1 male, 12.ix.2013, Bhutan, Langthel (Trongsa), Sarpang-Gelephu-Trongsa Highway, 27.456°N and 90.489°E, 1,165m, coll. J.S. Irungbam

Distribution: Bhutan (Mendrelgang, Trongsa, and Zhemgang), northeastern India (Arunachal Pradesh), China (Tibet), and northern Myanmar.

Genus *Callambulyx* Rothschild & Jordan, 1903

78. *Callambulyx poecilus* Rothschild, 1898 (Image 6I)

Materials examined: BM-21, BM-22, 2 males, 27.iv.2013, 12.ix.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; BM-158, 1 male, 12.ix.2013, Bhutan, Langthel (Trongsa), Sarpang-Gelephu-Trongsa Highway, 27.456°N and 90.489°E, 1,165m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang and Trongsa), Pakistan, Nepal, and northeastern India.

79. *Callambulyx rubricosa* (Walker, 1856) (Image 6J)

Materials examined: BM-19, BM-20, males, 15.vi.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; BM-160, 1 male, 21.iii.2014, Bhutan, Dagana (Dagana), 27.032°N



Image 6. A - *Dolbina inexacta* Walker, 1856 | B - *Marumba cristata cristata* (Butler, 1875) | C - *M. dyras dyras* Walker, 1856 | D - *M. sperchius sperchius* (Ménétriés, 1857) | E - *M. spectabilis spectabilis* Butler, 1875 | F - *Polyptychus trilineatus trilineatus* Moore, 1888 | G - *Rhodoprasina floralis* (Butler, 1876)* | H - *Cypoides parachinensis* Brechlin, 2009c | I - *Callambulyx poecilus* Rothschild, 1898 | J - *C. rubricosa* (Walker, 1856) | K - *C. junonia* (Butler, 1881) | L - *Clanis hyperion bhutana* Brechlin, 2014c | M - *C. titan* Rothschild & Jordan, 1903 | N - *C. undulosa gigantea* Rothschild, 1894 | O - *Ambulyx ochracea* Butler, 1885.

and 89.887°E, 1,580m, coll. J.S. Irungbam

Distribution: Bhutan (Mendrelgang, Dagana, and Paro), Nepal, northeastern India, Thailand, and Vietnam.

80. *Callambulyx junonia* (Butler, 1881) (Image 6K)

Materials examined: BM-161, 1 male, 15.v.2015, Bhutan, Damphu (Tsirang), 27.072°N and 90.109°E, 1,058m, coll. J.S. Irungbam; BM-128, 1 male, 26.vii.2014, Bhutan, Damthang (Haa), 27.430°N and 89.199°E, 3,414m, coll. Irungbam J.S. & Bhakta G.

Distribution: Bhutan (Tsirang, Trongsa, Paro, Haa and Samtse), northeastern India, southern China, northern Thailand, and northern Vietnam.

Genus *Anambulyx* Rothschild & Jordan, 1903

81. *Anambulyx elwesi* (Druce, 1882)

Materials examined: None.

Distribution: Bhutan (Trashigang and Trashiyangtse), northern Pakistan, northern India, Nepal, southwestern China, Myanmar, northern Thailand, and northern Vietnam.

Remarks: This species was not recorded in the study.

Genus *Sataspes* Moore, [1858]

82. *Sataspes infernalis* (Westwood, 1848)

Materials examined: None.

Distribution: Bhutan (Zhemgang?), southern and eastern India, Bangladesh, Nepal, Myanmar, China, Hong Kong, Thailand, Vietnam, Borneo, and Java.

Remarks: This species was not recorded in the study.

Genus *Clanis* Hübner, [1819]

83. *Clanis hyperion bhutana* Brechlin, 2014c (Image 6L)

Materials examined: BM-60, 1 male, 13.v.2012, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m.

Distribution: Bhutan (Tsirang and Zhemgang), northeastern India, southern China, and northern Thailand.

Remarks: Reported the species for the first time from Bhutan by Singh & Kitching (2014).

84. *Clanis titan* Rothschild & Jordan, 1903 (Image 6M)

Materials examined: BM-125, 1 male, 12.vi.2013, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; BM-321, 1 male, 18.v.2015, Bhutan, Dagapela (Dagana), 26.941°N and 89.922°E, 1,576m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Dagana, Samdrup

Jongkhar, and Zhemgang), southern and northeastern India, Nepal, Myanmar, northern Thailand, Peninsular Malaysia, and Sumatra.

85. *Clanis undulosa gigantea* Rothschild, 1894 (Image 6N)

Materials examined: BM-61, 1 male, 29.ix.2012, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; BM-302, 1 male, 12.ix.2013, Bhutan, Langthel (Trongsa), Sarpang-Gelephu-Trongsa Highway, 27.455°N and 90.489°E, 1,924m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Trongsa, and Zhemgang), northeastern India, Nepal, Thailand, and Peninsular Malaysia.

Genus *Clanidopsis* Rothschild & Jordan, 1903

86. *Clanidopsis exusta* (Butler, 1875)

Materials examined: None.

Distribution: Bhutan (Trashigang), northern Pakistan, northwestern India, central Nepal, and China (Tibet).

Remarks: This species was not recorded in the study. Recently recorded from Lungten Zampa Village, Trashigang, eastern Bhutan, by Jamtsho & Irungbam (2019).

Genus *Ambulyx* Westwood, 1847

87. *Ambulyx bhutana* Brechlin, 2014b

Materials examined: None.

Distribution: Bhutan (Trongsa).

Remarks: This species was not recorded in the study.

88. *Ambulyx ochracea* Butler, 1885 (Image 6O)

Materials examined: BM-05, BM-06, BM-07, 2 males, 1 female, 18.vi.2014, 12.ix.2014, 20.v.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam; BM-10, 1 male, 07.iv.2015, Bhutan, Damphu (Tsirang), 27.072°N and 90.109°E, 1,058m, coll. J.S. Irungbam; BM-08, 1 male, 10.iv.2014, Bhutan, Dagana (Dagana), 27.032°N and 89.887°E, 1,580m, coll. J.S. Irungbam & M.J. Irungbam; BM-09, 1 male, 20.v.2015, Bhutan, Sarpang Tar (Sarpang), Tsirang-Sarpang-Gelephu Highway, 26.897°N and 90.212°E, 829m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Dagana, Sarpang, Chukha, and Samdrup Jongkhar), northeastern India, Nepal, China, Taiwan, Hong Kong, Thailand, Vietnam, Cambodia, Laos, Japan, and Korea.

89. *Ambulyx substrigilis* (Westwood, 1848) (Image 7A)

Materials examined: BM-01, BM-02, 2 males, 27.ix.2013, 15.vi.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam; BM-152, BM-153, 1 male, 1 female, 15.iii.2015, Bhutan, Dagapela (Dagana), 26.941°N and 89.922°E, 1,576m; BM-154, 1 female, 21.ix.2015, Bhutan, Gelephu (Sarpang), 26.897°N and 90.212°E, 329m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Dagana, and Sarpang), northern and southern India, Nepal, Bangladesh, Thailand, Vietnam, Peninsular Malaysia, Borneo, Sumatra, Sri Lanka, and The Philippines (Palawan).

90. *Ambulyx liturata* Butler, 1875 (Image 7B)

Materials examined: BM-03, BM-04, 1 male, 1 female, 10.iv.2013, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang and Zhemgang), northeastern India, Nepal, Myanmar, southern China, Hong Kong, Thailand, Vietnam, Cambodia, and Laos.

91. *Ambulyx maculifera* Walker, 1866 (Image 7C)

Materials examined: MB-186, MB-187, 2 males, 15.v.2015, Bhutan, Damphu (Tsirang), 27.072°N and 90.109°E, 1,058m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang), India, and Nepal.

92. *Ambulyx sericeipennis sericeipennis* Butler, 1875 (Image 7D)

Materials examined: BM-132, 1 male, 12.ix.2013, Bhutan, Damphu (Tsirang), 27.072°N and 90.109°E, 1,058m, coll. J.S. Irungbam & M.J. Irungbam; BM-75, 1 male, 15.iii.2015, Bhutan, Dagapela (Dagana), 26.941°N and 89.922°E, 1,576m, coll. J.S. Irungbam; BM-68, 1 male, 20.ix.2014, Bhutan, Sarpang Tar (Sarpang), Tsirang-Sarpang-Gelephu Highway, 26.897°N and 90.212°E, 829m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Dagana, and Sarpang), northern Pakistan, Nepal, northern India, Myanmar, China, Thailand, Laos, Cambodia, Vietnam, Taiwan, Java, and The Philippines.

Genus *Amplypterus* Hübner, [1819]

93. *Amplypterus panopus panopus* (Cramer, 1779) (Image 7E)

Materials examined: BM-17, 1 male, 17.vi.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; BM-16, 1 male, 15.iii.2015, Bhutan, Dagapela (Dagana), 26.941°N and 89.922°E,

1,576m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Dagana, and Samdrup Jongkhar), Nepal, India, Sri Lanka, Myanmar, Thailand, Cambodia, Laos, Vietnam, China, Sundaland, and The Philippines.

94. *Amplypterus masoni masoni* (Clark, 1924) * (Image 7F)

Materials examined: BM-15, 1 male, 06.iv.2013, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; 1 female (image record), 15.v.2015, Bhutan, Darachu (Tsirang), Gelephu-Thimphu Highway, 26.947°E and 90.203°N, 1,866m (Image by I. Kehimkar).

Distribution: Bhutan (Tsirang and Sarpang), northeastern India, Nepal, Thailand, Vietnam, Sumatra, and Malaysia.

Remarks: A new country record for Bhutan.

Subfamily Macroglossinae Harris, 1839

Genus *Cephonodes* Hübner, [1819]

95. *Cephonodes hylas hylas* (Linnaeus, 1771)

Materials examined: None.

Distribution: Bhutan, northern Pakistan, India, Nepal, Sri Lanka, Myanmar, China, South Korea, southern Japan, Thailand, Laos, Vietnam, Indonesia, Taiwan, Hong Kong, Peninsular Malaysia, The Philippines, and Russian Far East.

Remarks: This species was not recorded in the study.

Genus *Neogurelca* Hogenes & Treadaway, 1993

96. *Neogurelca hyas* (Walker, 1856)

Materials examined: None.

Distribution: Bhutan, India, Nepal, Myanmar, central and southern China, Taiwan, southern Japan, Thailand, Vietnam, Malaysia, Indonesia, and The Philippines.

Remarks: This species was not recorded in the study.

97. *Neogurelca masuriensis* (Butler, 1875)

Materials examined: None.

Distribution: Bhutan (Thimphu), northwestern and northern India, and China (Yunnan).

Remarks: This species was not recorded in the study.

Genus *Nephele* Hübner, [1819]

98. *Nephele hespera* (Fabricius, 1775) (Image 7G)

Materials examined: BM-81, 1 male, 28.iv.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang), Afghanistan, Pakistan, Sri Lanka, India, Nepal, the Andaman Islands, Myanmar,



Image 7. A - *Ambulyx substrigilis* (Westwood, 1848) | B - *A. liturata* Butler, 1875 | C - *A. maculifera* Walker, 1866 | D - *A. sericeipennis* Butler, 1875 | E - *Amplifypterus panopus panopus* (Cramer, 1779) | F - *A. masoni masoni* (Clark, 1924)* | G - *Nephele hespera* (Fabricius, 1775) | H - *Daphnis hypothous crameri* Eitschberger & Melichar, 2010 | I - *Elibia dolichoides* (C. & R. Felder, 1874) | J - *Ampelophaga rubiginosa rubiginosa* Bremer & Grey, 1853 | K - *A. khasiana* Rothschild, 1895 | L - *Eupanacra variolosa* (Walker, 1856) | M - *E. metallica* (Butler, 1875) | N - *Acosmeryx anceus subdentata* Rothschild & Jordan, 1903 | O - *A. naga naga* (Moore, [1858]).

southern China, Hong Kong, Thailand, Vietnam, Laos, Peninsular Malaysia, Sumatra, and Java.

Genus *Hayesiana* Fletcher, 1982

99. *Hayesiana triopus* (Westwood, 1847)

Materials examined: None.

Distribution: Bhutan (Zhemgang and Sarpang), Nepal, northeastern India, southern China, Hong Kong, Thailand, northern Vietnam, and Peninsular Malaysia.

Genus *Eurypteryx* C. & R. Felder, 1874

100. *Eurypteryx bhaga* (Moore, [1866])

Materials examined: None.

Distribution: Bhutan, Nepal, northeastern India, southwestern to central China, Thailand, Malaysia, Sumatra, Java, and Kalimantan.

Remarks: This species was not recorded in the study.

Genus *Daphnis* Hübner, [1819]

101. *Daphnis hypothous crameri* Eitschberger & Melichar, 2010 (Image 7H)

Materials examined: 1 male (image record), 08.viii.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m (Image by J.S. Irungbam).; 1 male (image record), 20.ix.2014, Bhutan, Sarpang Tar (Sarpang), Tsirang-Sarpang-Gelephu Highway, 26.897°N and 90.212°E, 829m (Image by Namgyel D.).

Distribution: Bhutan (Tsirang, Trongsa, Sarpang, and Zhemgang), India, Nepal, Sri Lanka, Myanmar, southern China, Taiwan, Hong Kong, The Philippines, Thailand, Malaysia, western Indonesia, and the Western Palearctic region.

Genus *Elibia* Walker, 1856

102. *Elibia dolichoides* (C. & R. Felder, 1874) (Image 7I)

Materials examined: 1 male (image record), 03.ix.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m (Image by J.S. Irungbam).

Distribution: Bhutan (Tsirang and Zhemgang), northeastern India, Nepal, Thailand, and Peninsular Malaysia.

Genus *Ampelophaga* Bremer & Grey, 1853

103. *Ampelophaga rubiginosa rubiginosa* Bremer & Grey, 1853 (Image 7J)

Materials examined: BM-50, BM-135, 2 males, 19.ix.2013, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Dagana, Trashigang, and Zhemgang), northeastern Afghanistan, Pakistan,

India, Nepal, Myanmar, China, Korean Peninsula, the Russian Far East, Japan, Thailand, Hong Kong, Laos, Vietnam, Peninsular Malaysia, and northern Sumatra.

104. *Ampelophaga khasiana* Rothschild, 1895 (Image 7K)

Materials examined: BM-287, 1 male, 12.ix.2013, Bhutan, Langthel (Trongsa), Sarpang-Gelephu-Trongsa Highway, 27.456°N and 90.489°E, 1,165m, coll. J.S. Irungbam

Distribution: Bhutan (Trongsa and Zhemgang), Nepal, northeastern India, Myanmar, and China.

Genus *Eupanacra* Cadiou & Holloway, 1989

105. *Eupanacra perfecta perfecta* (Butler, 1875)

Materials examined: None.

Distribution: Bhutan (Tsirang), northeastern India, Myanmar, southwestern China, Thailand, and Vietnam.

Remarks: This species was not recorded in the study.

106. *Eupanacra variolosa* (Walker, 1856) (Image 7L)

Material examined: BM-80, 1 male, 11.viii.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan, India, Bangladesh, southwestern China, Thailand, Malaysia, and Indonesia.

107. *Eupanacra metallica* (Butler, 1875) (Image 7M)

Materials examined: 1 male (image record), 02.x.2014, Bhutan, Dagapela (Dagana), 26.941°N and 89.922°E, 1,576m (Image by Namgyel D.).

Distribution: Bhutan (Tsirang, Dagana and Trashiyangtse), India, Nepal, Bangladesh, Myanmar, and China.

108. *Eupanacra mydon* (Walker, 1856)

Materials examined: None.

Distribution: Bhutan, Nepal, northeastern India, Bangladesh, Myanmar, China, Thailand, Vietnam, and Peninsular Malaysia.

Remarks: This species was not recorded in the study.

109. *Eupanacra busiris busiris* (Walker, 1856)

Materials examined: None.

Distribution: Bhutan (Tsirang), Nepal, northeastern India, Bangladesh, Myanmar, Thailand, southern China, Laos, Vietnam, Malaysia, and Indonesia.

Genus *Acosmeryx* Boisduval, [1875]

110. *Acosmeryx anceus subdentata* Rothschild & Jordan, 1903 (Image 7N)

Materials examined: BM-42, BM-43, 1 male, 1 female, 12.v.2013, 10.xi.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam; BM-146, 1 female, 20.iv.2014, Bhutan, Dagana (Dagana), 27.032°N and 89.887°E, 1,580m, coll. J.S. Irungbam; BM-148, 1 male, 16.ix.2014, Bhutan, Sarpang Tar (Sarpang), Tsirang-Sarpang-Gelephu Highway, 26.897°N and 90.212°E, 829m, coll. J.S. Irungbam.

Distribution: Bhutan (Tsirang, Dagana, Sarpang, and Zhemgang), India, Nepal, China, Thailand, Vietnam, Malaysia, Indonesia, and The Philippines.

111. *Acosmeryx naga naga* (Moore, [1858]) (Image 7O)

Materials examined: BM-47, BM-49, 2 males, 21.v.2013, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam; BM-48, 1 male, 16.ix.2014, Bhutan, Sarpang Tar (Sarpang), Tsirang-Sarpang-Gelephu Highway, 26.897°N and 90.212°E, 829m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Sarpang, Zhemgang, and Trongsa), India, Nepal, Thailand, Malaysia, Vietnam, China, Taiwan, Korea, Japan, and Russian Far East.

112. *Acosmeryx pseudonaga* Butler, 1881 (Image 8A)

Materials examined: BM-52, BM-53, 1 male, 1 female, 21.viii.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam; BM-51, 1 female, 20.iv.2014, Bhutan, Dagana (Dagana), 27.032°N and 89.887°E, 1,580m, coll. J.S. Irungbam; BM-112, 1 male, 16.ix.2014, Bhutan, Sarpang Tar (Sarpang), Tsirang-Sarpang-Gelephu Highway, 26.897°N and 90.212°E, 829m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Dagana, Sarpang, and Zhemgang), western and northeastern India, China, Thailand, Laos, Malaysia, and Indonesia.

113. *Acosmeryx shervillii* Boisduval, 1875 (Image 8B)

Materials examined: BM-44, 1 male, 09.ix.2012, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam

Distribution: Bhutan (Tsirang Trashigang and Samdrup Jongkhar) Nepal, northern India, Sri Lanka, southern China, Hong Kong, Thailand, Vietnam, Peninsular Malaysia, Sumatra, Borneo, and Java.

114. *Acosmeryx omissa* Rothschild & Jordan, 1903 (Image 8C)

Materials examined: BM-40, BM-41, 2 males,

02.xii.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Trashigang, and Samdrup Jongkhar), Nepal, northeastern India, northern Thailand, and Vietnam.

115. *Acosmeryx sericeus* (Walker, 1856) (Image 8D)

Materials examined: BM-45, BM-46, 2 males, 29.iv.2013, 27.iv.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam

Distribution: Bhutan (Tsirang), Nepal, northeastern India, Bangladesh, southern China, Thailand, Vietnam, and Peninsular Malaysia.

Genus *Acosmerycoides* Mell, 1922

116. *Acosmerycoides harterti* (Rothschild, 1895) * (Image 8E)

Materials examined: BM-97, 1 male, 21.viii.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam; BM-186, 1 male, 18.vii.2015, Bhutan, Dagapela (Dagana), 26.941°N and 89.922°E, 1,576m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang and Dagana), northeastern India, Myanmar, China, Taiwan, Malaysia, Thailand, Laos, and Vietnam.

Remarks: A new country record for Bhutan.

Genus *Dahira* Moore, 1888

117. *Dahira sinyaeorum* Brechlin, 2014a

Materials examined: None.

Distribution: Bhutan (Trongsa, Zhemgang, and Samdrup Jongkhar).

Remarks: This species was not recorded in the study.

118. *Dahira marisae* Schnitzler & Stüning, 2009

Materials examined: None.

Distribution: Bhutan (Thimphu).

Remarks: This species was not recorded in the study.

119. *Dahira yunnanfuana* (Clark, 1925)

Materials examined: None

Distribution: Bhutan (Thimphu), Nepal, Myanmar, and China.

Remarks: This species was not recorded in the study. It was recorded from Bhutan as *Acosmeryx montivaga* Kernbach, 1966 by Dierl (1975), which is now synonymous with *Dahira yunnanfuana*. Occurs along the southeastern slopes of the Himalaya.



Image 8. A - *Acosmeryx pseudonaga* Butler, 1881 | B - *A. shervillii* Boisduval, 1875 | C - *A. omissa* Rothschild & Jordan, 1903 | D - *A. sericeus* (Walker, 1856) | E - *Acosmerycoides harterti* (Rothschild, 1895)* | F - *Macroglossum bombylans* Boisduval, 1875 | G - *M. neotroglodytus* Kitching & Cadiou, 2000 | H - *M. corythus corythus* Walker, 1856 | I - *M. sitiene* Walker, 1856 | J - *Deilephila elpenor* (Linnaeus, 1758) | K - *Hippotion rosetta* (Swinhoe, 1892) | L - *H. celerio* (Linnaeus, 1758)* | M - *Pergesa acteus* (Cramer, 1777) | N - *Theretra alecto* (Linnaeus, 1758) | O - *T. clotho clotho* (Drury, 1773). Species marked with "*" incates new record to Bhutan.

Genus *Macroglossum* Scopoli, 1777

120. *Macroglossum bombylans* Boisduval, 1875 (Image 8F)

Materials examined: BM-78, BM-79, 2 males, 30.iii.2013, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang), Nepal, India, China, Taiwan, Hong Kong, Korea, Japan, northern Thailand, northern Vietnam, and The Philippines.

121. *Macroglossum neotrogodytus* Kitching & Cadiou, 2000 (Image 8G)

Materials examined: 1 male (image record), 16.iii.2013, 05.iv.2013, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m (Image by J.S. Irungbam).

Distribution: Bhutan (Tsirang and Trongsa), Nepal, southern and northeastern India, Sri Lanka, S China, Taiwan, Thailand, Peninsular Malaysia, Indonesia (Sumatra, Java, and Sulawesi), and The Philippines.

122. *Macroglossum nycteris* Kollar, 1844

Materials examined: None.

Distribution: Bhutan (Tsirang and Haa), Afghanistan, Pakistan, Nepal, India, northern Myanmar, and China.

Remarks: This species was not recorded in the study.

123. *Macroglossum corythus corythus* Walker, 1856 (Image 8H)

Materials examined: 1 male (image record), 18.viii.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m (Image by J.S. Irungbam).

Distribution: Bhutan (Tsirang and Samdrup Jongkhar), Nepal, western and northeastern India, Bangladesh, Andaman Islands, eastern and southern China, Japan, Taiwan, Hong Kong, Thailand, Vietnam, Malaysia, Indonesia, The Philippines, Wallacea, and Sundaland.

124. *Macroglossum sitiene* Walker, 1856 (Image 8I)

Materials examined: 1 male (image record), 26.vii.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m (Image by Gyeltshen); 1 male (image record), 18.xi.2015, Bhutan, Dagapela (Dagana), 26.941°N and 89.922°E, 1,576m (Image by J.S. Irungbam).

Distribution: Bhutan (Tsirang, Lhamoyzingkha, and Sarpang), India, Bangladesh, Sri Lanka, Myanmar, southern China, Taiwan, Hong Kong, southern Japan, Thailand, Vietnam, Peninsular Malaysia, and Indonesia (Sumatra).

125. *Macroglossum belis* (Linnaeus, 1758)

Materials examined: None.

Distribution: Bhutan, northern Pakistan, Nepal, India, Sri Lanka, Bangladesh, Myanmar, China, Taiwan, Hong Kong, Thailand, Laos, Vietnam, and Japan.

Remarks: This species was not recorded in the study.

126. *Macroglossum pyrrhosticta* Butler, 1875

Materials examined: None.

Distribution: Bhutan, Nepal, eastern India, Sri Lanka, China, South Korea, North Korea, Japan, the southern Russian Far East, Taiwan, Hong Kong, Thailand, Vietnam, Malaysia (Sarawak), Indonesia, The Philippines, and Sundaland.

Remarks: This species was not recorded in the study.

Genus *Hyles* Hübner, [1819]

127. *Hyles gallii* (Rottemburg, 1775)

Materials examined: None.

Distribution: Bhutan (Wangdue Phodrang?), temperate Europe (resident), temperate Russia, southwestern Mongolia, northern China (Tibet), Korea, northern Japan, northern Turkey, The Caucasus, Tajikistan, Kyrgyzstan, Afghanistan, eastern Kazakhstan, northern Pakistan, and Nepal. This species is also present in the USA and Canada.

Genus *Deilephila* Laspeyres, 1809

128. *Deilephila elpenor* (Linnaeus, 1758) (Image 8J)

Materials examined: BM-226, IJ-331, 2 males, 21.vi.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Thimphu and Tsirang), Palearctic region from western Europe to the Russian Far East and Japan, south and west through China to Nepal, northeastern India, Bangladesh, northern Myanmar, northern Thailand, and northern Vietnam.

Genus *Hippotion* Hübner, [1819]

129. *Hippotion boerhaviae* (Fabricius, 1775)

Materials examined: None.

Distribution: Bhutan (Wangduephodrang), northeastern Pakistan, India, Sri Lanka, Nepal, Thailand, southeastern China, Vietnam, The Philippines, Indonesia, New Guinea, eastern Australia, The Solomon Islands, and New Caledonia.

Remarks: This species was not recorded in the study.

130. *Hippotion rosetta* (Swinhoe, 1892) (Image 8K)

Materials examined: BM-75, BM-224, 1 male, 1 female, 09.vii.2012, 11.viii.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Trongsa, and Zhemgang), southern Pakistan, India, Sri Lanka, Thailand, China, Taiwan, Hong Kong, southern Japan, The Philippines, Maldives Islands, Andaman Islands, The Solomon Islands, and New Guinea.

131. *Hippotion celerio* (Linnaeus, 1758) * (Image 8L)
Materials examined: 1 female (image record), 11.viii.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m (Image by J.S. Irungbam).

Distribution: Bhutan (Tsirang), Africa, southern Europe, Arabian Peninsula, Pakistan, India, Nepal, Australia, southern China, Hong Kong, and southern Japan.

Remarks: A new country record for Bhutan.

132. *Hippotion rafflesii rafflesii* (Moore, [1858])

Materials examined: None.

Distribution: Bhutan, Nepal, southern and eastern India, Sri Lanka, Myanmar, Thailand, southern China, Peninsular Malaysia, Sumatra, Java, Sulawesi, and The Philippines.

Remarks: This species was not recorded in the study.

Genus *Pergesa* Walker, 1856

133. *Pergesa acteus* (Cramer, 1777) (Image 8M)

Materials examined: BM-70, BM-71, 2 males, 06.ix.2013, 11.viii.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang and Zhemgang), Nepal, India, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Japan, Thailand, Peninsular Malaysia, Indonesia, Sundaland, Moluccas, and The Philippines.

Genus *Theretra* Hübner, [1819]

134. *Theretra alecto* (Linnaeus, 1758) (Image 8N)

Materials examined: BM-59, 1 male, 07.vi.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; BM-146, 1 female, 20.ix.2014, Bhutan, Sarpang Tar (Sarpang), Tsirang-Sarpang-Gelephu Highway, 26.897°N and 90.212°E, 692m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang, Sarpang, Zhemgang, and Trashigang), Pakistan, Nepal, India, Sri Lanka, China, Taiwan, Hong Kong, Japan, The Philippines, Indonesia, Greece, Bulgaria, Turkey, Iran, Turkmenistan, Uzbekistan, Kyrgyzstan, Afghanistan, Iraq, Lebanon, Israel, and Egypt.

135. *Theretra clotho clotho* (Drury, 1773) (Image 8O)

Materials examined: BM-58, BM-59, 2 males, 12.ix.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N

and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang and Chukha), northern Pakistan, Nepal, India, Sri Lanka, Myanmar, China, Hong Kong, Japan, Indonesia, the Philippines, and Sundaland.

136. *Theretra tibetiana* Vaglia & Haxaire, 2010* (Image 9A)

Materials examined: BM-221, BM-223, 2 males, 12.ix.2012, 12.ix.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam.

Distribution: Bhutan (Tsirang), northeastern India, China (Tibet), Thailand, and northern Vietnam.

Remarks: A new country record for Bhutan and range extension to Bhutan from its earlier known distribution range.

137. *Theretra nessus nessus* (Drury, 1773) (Image 9B)

Materials examined: BM-54, BM-56, BM-220, 2 males, 1 female, 20.vi.2013, 10.ix.2014, 07.x.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam; BM-98, BM-219, 2 males, 16.viii.2015, Bhutan, Dagapela (Dagana), 26.941°N and 89.922°E, 1,576m, coll. J.S. Irungbam; 1 female (image record), 20.ix.2014, Bhutan, Sarpang Tar (Sarpang), Tsirang-Sarpang-Gelephu Highway, 26.897°N and 90.212°E, 692m (Image by J.S. Irungbam).

Distribution: Bhutan (Tsirang, Dagana, Sarpang, and Chukha), India, Nepal, Sri Lanka, Myanmar, southern China, Taiwan, Thailand, Vietnam, South Korea, Japan, Malaysia, Singapore, Indonesia, Sundaland, the Philippines, and Australia.

138. *Theretra oldenlandiae oldenlandiae* (Fabricius, 1775) (Image 9C)

Materials examined: BM-85, 1 male, 10.ix.2013, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; 1 male (image record), 20.ix.2014, Bhutan, Sarpang Tar (Sarpang), Tsirang-Sarpang-Gelephu Highway, 26.897°N and 90.212°E, 692m (Image by J.S. Irungbam).

Distribution: Bhutan (Tsirang and Sarpang), northern Afghanistan, northern Pakistan, Nepal, India, Sri Lanka, Myanmar, China, Taiwan, Hong Kong, Vietnam, South Korea, Japan, The Solomon Islands, New Guinea, and The Philippines.

139. *Theretra silhetensis silhetensis* (Walker, 1856) * (Image 9D)

Materials examined: 1 male (image record), 08.ix.2013, Bhutan, Mendrelgang (Tsirang), 26.950°N

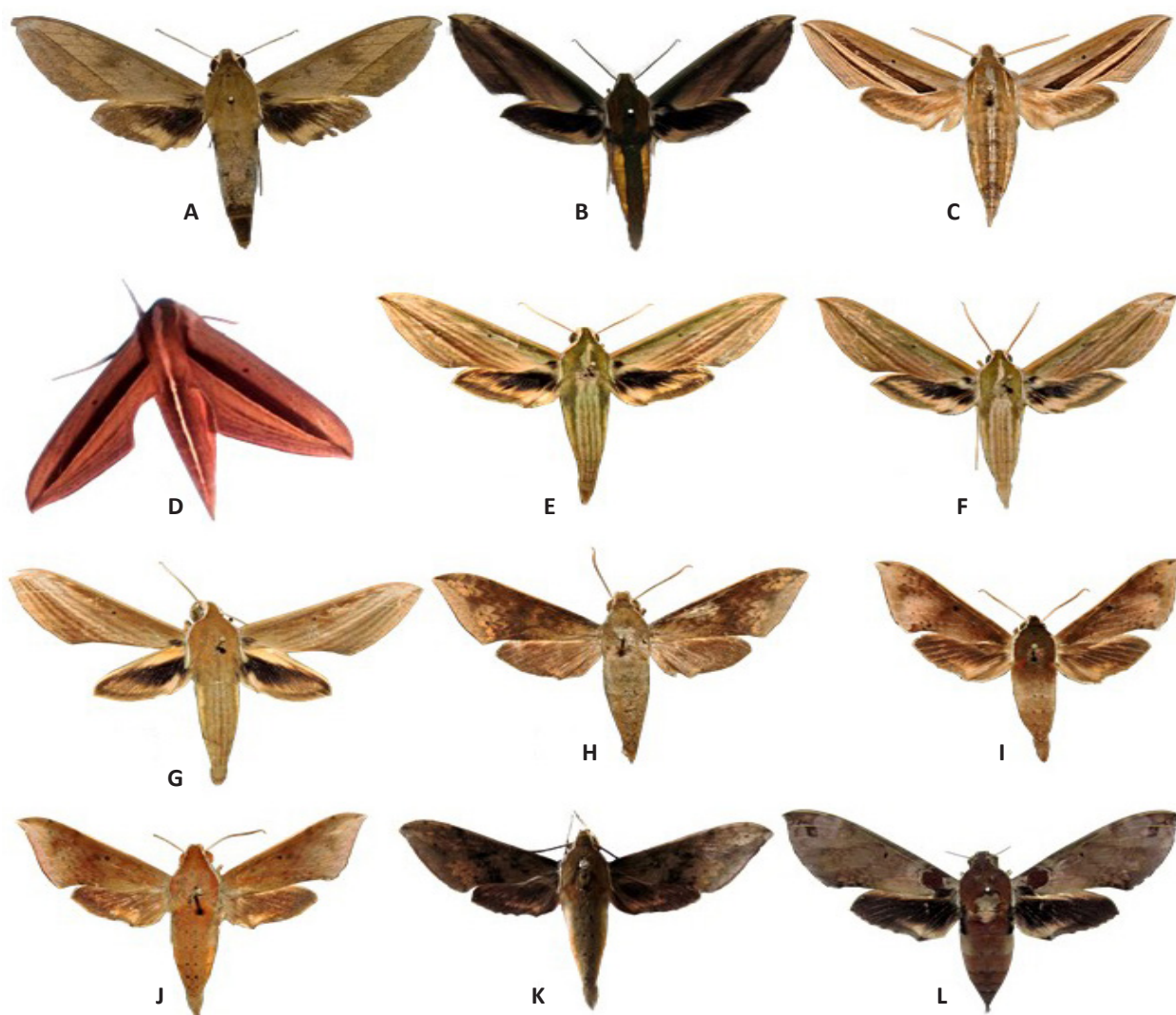


Image 9. A - *Theretra tibetiana* Vaglia & Haxaire, 2010* | B - *T. nessus nessus* (Drury, 1773) | C - *T. oldenlandiae oldenlandiae* (Fabricius, 1775) | D - *T. silhetensis silhetensis* (Walker, 1856)* | E & F - *C. lineosa* (Walker, 1856) | G - *C. minor minor* (Butler, 1875) | H - *Rhagastis velata* (Walker, 1866) | I - *Rhagastis velata* (Walker, 1866) (dark form) | J - *R. albomarginatus albomarginatus* (Rothschild, 1894) | K - *R. castor aurifera* (Walker, 1856) | L - *Cechetna helops helops* (Walker, 1856)*. Species marked with "*" incates new record to Bhutan.

and 90.114°E, 1,233m (Image by J.S. Irungbam); 1 male (image record), 20.ix.2014, Bhutan, Sarpang Tar (Sarpang), Tsirang-Sarpang-Gelephu Highway, 26.897°N and 90.212°E, 692m (Image by J.S. Irungbam).

Distribution: Bhutan (Tsirang, Samtse, and Sarpang), India, Nepal, Bangladesh, Sri Lanka, Myanmar, the Andaman Islands, Thailand, China, Taiwan, Japan, Vietnam, Malaysia, and Indonesia.

Remarks: A new country record for Bhutan.

Genus *Cechetra* Zolotuhin & Ryabov, 2012

140. *Cechetra scotti* (Rothschild, 1920)

Materials examined: None.

Distribution: Bhutan (Tsirang and Trongsa), Pakistan,

Nepal, India, southwestern China, and northern Vietnam.

Remarks: This species was not recorded in the study.

141. *Cechetra lineosa* (Walker, 1856) (Image 9E,F)

Materials examined: BM-81, BM-82, 1 male, 1 female, 28.iv.2014, 10.v.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam; BM-83, 1 male, 08.v.2013, Bhutan, Dagapela (Dagana), 26.941°N and 89.922°E, 1,576m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang and Dagana), northern India, Nepal, Bangladesh, Myanmar, Thailand, southern China, Taiwan, Vietnam, Malaysia, Indonesia (Sumatra, Java, and Kalimantan).

142. *Cechetra minor* (Butler, 1875) (Image 9G)

Materials examined: BM-72, BM-76, 1 male, 1 female, 20.iv.2014, 15.v.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang and eastern Bhutan), India, Nepal, Thailand, China, Taiwan, Japan, and Vietnam.

143. *Cechetra bryki* Ivshin & Krutov, 2018

Materials examined: None.

Distribution: Bhutan, Nepal, northeastern India, Myanmar, southwestern China (Yunnan), Laos, and northern Vietnam.

Genus *Rhagastis* Rothschild & Jordan, 1903144. *Rhagastis velata* (Walker, 1866) (Image 9H,I)

Materials examined: BM-64, BM-65, 2 males, 22.vii.2013, 14.i.2015, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam; 1 male, 20.ix.2014, Bhutan, Sarpang Tar (Sarpang), Tsirang-Sarpang-Gelephu Highway, 26.897°N and 90.212°E, 829m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang and Sarpang), Nepal, northeastern India, Thailand, China, and Taiwan.

145. *Rhagastis albomarginatus albomarginatus* (Rothschild, 1894) (Image 9J)

Materials examined: BM-68, 1 male, 15.iv.2013, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam; BM-69, 1 female, 20.ix.2014, Bhutan, Sarpang Tar (Sarpang), Tsirang-Sarpang-Gelephu Highway, 26.897°N and 90.212°E, 829m, coll. J.S. Irungbam.

Distribution: Bhutan (Tsirang, Sarpang, and Samdrup Jongkhar), India, Nepal, China, Taiwan, Hong Kong, Myanmar, Sumatra, Java, and Borneo.

146. *Rhagastis castor aurifera* (Walker, 1856) (Image 9K)

Materials examined: BM-66, BM-67, 2 males, 22.iii.2012, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam

Distribution: Bhutan (Tsirang), Nepal, northeastern India, Thailand, southern China, and Vietnam.

147. *Rhagastis olivacea* (Moore, 1857)

Materials examined: None.

Distribution: Bhutan (Tsirang), northeastern Pakistan, northern India, Nepal, Myanmar, northern Thailand, Laos, northern Vietnam, and southern China.

Remarks: This species was not recorded in the study.

148. *Rhagastis gloriosa* (Butler, 1875)

Materials examined: None.

Distribution: Bhutan (Tsirang and eastern Bhutan), Nepal, northeastern India, Myanmar, China, Thailand, and Vietnam.

Remarks: This species was not recorded in the study.

Genus *Cechenena* Rothschild & Jordan, 1903149. *Cechenena aegrota* (Butler, 1875)

Materials examined: None.

Distribution: Bhutan, Nepal, northeastern India, Bangladesh, southern China, Hong Kong, Thailand, Vietnam, Laos, and Vietnam.

Remarks: This species was not recorded in the study.

150. *Cechenena helops helops* (Walker, 1856) * (Image 9L)

Materials examined: BM-95, BM-96, 2 males, 03.ix.2014, 29.xi.2014, Bhutan, Mendrelgang (Tsirang), 26.950°N and 90.114°E, 1,233m, coll. J.S. Irungbam & M.J. Irungbam

Distribution: Bhutan (Tsirang), Nepal, northeastern India, Thailand, southwestern China, Vietnam, Malaysia, Indonesia, and The Philippines.

Remarks: A new country record for Bhutan.

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