

OPEN ACCESS



The Journal of Threatened Taxa is dedicated to building evidence for conservation globally by publishing peer-reviewed articles online every month at a reasonably rapid rate at www.threatenedtaxa.org. All articles published in JoTT are registered under [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/) unless otherwise mentioned. JoTT allows unrestricted use of articles in any medium, reproduction, and distribution by providing adequate credit to the authors and the source of publication.



Journal of Threatened Taxa

Building evidence for conservation globally

www.threatenedtaxa.org

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

COMMUNICATION

**MOTHS OF THE FAMILY LIMACODIDAE DUPONCHEL, 1845
(LEPIDOPTERA: ZYGAENOIDEA) FROM BHUTAN WITH SIX NEW
GENERIC AND 12 NEW SPECIES RECORDS**

Jatishwor Singh Irungbam, Meenakshi Singh Chib &
Alexey V. Solovyev

26 February 2017 | Vol. 9 | No. 2 | Pp. 9795–9813
10.11609/jott.2443.9.2.9795-9813



For Focus, Scope, Aims, Policies and Guidelines visit http://threatenedtaxa.org/About_JoTT.asp

For Article Submission Guidelines visit http://threatenedtaxa.org/Submission_Guidelines.asp

For Policies against Scientific Misconduct visit http://threatenedtaxa.org/JoTT_Policy_against_Scientific_Misconduct.asp

For reprints contact info@threatenedtaxa.org

Partner



Publisher/Host





MOTHS OF THE FAMILY LIMACODIDAE DUPONCHEL, 1845 (LEPIDOPTERA: ZYGAENOIDEA) FROM BHUTAN WITH SIX NEW GENERIC AND 12 NEW SPECIES RECORDS

ISSN 0974-7907 (Online)
ISSN 0974-7893 (Print)

Jatishwor Singh Irungbam¹, Meenakshi Singh Chib² & Alexey V. Solovyev³

^{1,2} Faculty of Science, University of South Bohemia, Ceske Budejovice 37005, Czech Republic

^{1,2} Institute of Entomology, Biology Centre, Czech Academy of Science, Ceske Budejovice 37005, Czech Republic

³ Department of Biology and Chemistry, Ulyanovsk State Pedagogical University, Ulyanovsk 432071, Russia

¹ jatishwor.irungbam@gmail.com (corresponding author), ² meenakshi.irungbam@gmail.com,

³ solovyev_alexey@mail.ru

OPEN ACCESS



Abstract: The present paper provides a checklist of 51 species in 37 genera of moths belonging to the family Limacodidae from Bhutan, of which, six genera, *Setora* Walker, 1855, *Tennya* Solovyev & Witt, 2009, *Iraga* Matsumura, 1927, *Vanlangia* Solovyev & Witt 2009, *Sansarea* Solovyev & Witt, 2009, and *Belippa* Walker, 1865 are reported for the first time from Bhutan, and 12 species, *Setora postornata* (Hampson, 1900), *Setora fletcheri* Holloway, 1987, *Scopelodes testacea* Butler, 1886, *Thosea magna* Hering, 1931, *Miresa fulgida* Wileman, 1910, *Susica himalayana* Holloway, 1982, *Tennya propolia* (Hampson, 1900), *Iraga rugosa* (Wileman, 1911), *Cheromettia ferruginea* (Moore, 1877), *Vanlangia uniformis* (Hering, 1931), *Sansarea circulifera* (Hering, 1933) and *Belippa horrida* Walker, 1865 are new records for Bhutan. The study was conducted at Tsirang, Dagana and Sarpang districts of Bhutan from 2013 to 2015.

Keywords: Bhutan, checklist, Limacodidae, new record.

DOI: <http://doi.org/10.11609/jott.2443.9.2.9795-9813> | ZooBank: <urn:lsid:zoobank.org:pub:67914E4A-F82A-489F-82F6-2A696407FF48>

Editor: Sanjay Sondhi, Titli Trust, Dehradun, India.

Date of publication: 26 February 2017 (online & print)

Manuscript details: Ms # 2443 | Received 13 June 2016 | Final received 03 January 2017 | Finally accepted 10 January 2017

Citation: Irungbam, J.S., M.S. Chib & A.V. Solovyev (2017). Moths of the family Limacodidae Duponchel, 1845 (Lepidoptera: Zygaenoidea) from Bhutan with six new generic and 12 new species records. *Journal of Threatened Taxa* 9(2): 9795–9813; <http://doi.org/10.11609/jott.2443.9.2.9795-9813>

Copyright: © Irungbam et al. 2017. Creative Commons Attribution 4.0 International License. JoTT allows unrestricted use of this article in any medium, reproduction and distribution by providing adequate credit to the authors and the source of publication.

Funding: BTFEC & NBC, Thimphu (MB0149Y15); Czech Science Foundation (GA CR:14-36098G) and Grant Agency, University of South Bohemia (GA JU 152/2016/P).

Competing interests: The authors declare no competing interests.

Author Details: JATISHWOR SINGH IRUNGBAM (JSI) is a PhD student at Faculty of Science, University of South Bohemia, Czech Republic and also working as Research Assistant at Institute of Entomology, Biology Centre, Czech Academy of Science, Czech Republic. He has been interested on Lepidoptera studies and is now focusing on taxonomy, ecology and conservation of Lepidoptera. Currently he is working on the moths of Shirui hills, Manipur, northeastern India for his PhD research. He is also a member of Bhutan Ecological Society. MEENAKSHI SINGH CHIB (MSC) is a PhD student at Faculty of Science, University of South Bohemia, Czech Republic and also working as Research Assistant at Institute of Entomology, Biology Centre, Czech Academy of Science, Czech Republic. She has been interested on Lepidoptera mainly focusing on ecology and conservation of Lepidoptera. Currently, she is working on the Phylogeographic patterns of Afro-oriental species of butterflies for her PhD research. ALEXEY V. SOLOVYEV (AVS) is an assistant professor of the Ulyanovsk State Pedagogical University (Russia). He has been interested on Systematic, morphology and phylogeny of Lepidoptera with special interest on systematic, morphology and phylogeny of Limacodidae (Lepidoptera, Zygaenoidea).

Author Contribution: JSI conducted the field work in the study area since 2011 and 2015, identified the moths, wrote the manuscript and prepared the tables, plates and figures. MSC assisted JSI in the field works, took photographs of the materials during the field surveys, help in literature review and reviewed the manuscript. AVS provided his assistance on the identification and confirmation of the materials. He also assisted JSI during the preparation of manuscript and did the corrections on the initial stage of the manuscript.

Acknowledgements: We wish to thank the unknown reviewers who provided useful comments on previous versions of this manuscript. We also thank the principal and staff of Mendrelgang Central School, Tsirang (Bhutan) for their moral support and encouragement during the conduct of the project. The first author thank the Bhutan Trust Fund for Environment Conservation, Thimphu (MB0149Y15) for providing financial assistance for the field visits and equipment, and the National Biodiversity Center, Thimphu, for coordinating the project. The first author also thanks Czech Science Foundation (GA CR:14-36098G) and Grant Agency, University of South Bohemia (GA JU 152/2016/P) for partially supporting the work during the preparation of the manuscript..



Přirodovědecká
Fakulta
Faculty
of Science
Jihočeská univerzita
v Českých Budějovicích
University of South Bohemia
in České Budějovice



Entomologický ústav
Institute of Entomology

INTRODUCTION

The Limacodidae Duponchel, 1845 are mainly a tropical and subtropical family of moths and are very diverse in all continents. There are 1,672 species in 301 genera, currently known globally (Nieukerken et al. 2011). The moths are nocturnal and are attracted to light. They can be easily identified due to their characteristic silky shine on the forewing. They are of different sizes, wing patterns and coloration. The males have bipectinate to filiform antennae, but females always have filiform antennae. While resting, the body is held at an angle to the substrate supported by the extended legs with wings draped laterally (Godfray et al. 1987). The family Limacodidae is placed in the superfamily Zygaenoidea Latreille, 1809 and classified into two subfamilies—Limacodinae and Chrysopolominae (Epstein et al. 1999).

The family remains poorly studied in the Indian sub-region including Bhutan. Sir George F. Hampson (1892, 1895) reports 96 species of this family in this region of which only one species was reported from Bhutan. The primary checklist on the Limacodidae of Bhutan can be found in the catalogue of Heterocera from Sikkim and Bhutan by G.C. Dudgeon (1900), with notes and additions from Sir H.J. Elwes and Sir George F. Hampson. In this catalogue, Dudgeon reported 32 species from Bhutan. The Swiss expedition to Bhutan during 1972 recorded only nine species from the western region of Bhutan (Dierl 1975). Yoshimoto (1993, 1994) also reported 43 species from different locations in Nepal published in different volumes of Moths of Nepal series (Haruta 1993, 1994). A few more species are reported from Bhutan by Inoue (1970), Solovyev & Witt (2009), Solovyev (2010, 2014), and D.B. Chettri (2014). Thus, the compilation on the available records on the Limacodidae fauna of Bhutan confirms the presence of 51 species in Bhutan. The family is also important for the behavior of their larvae, feeding on different plant sources as a pest, but in Bhutan their pest status is unknown. The list provided in the present paper is the first systematic checklist of the Limacodidae fauna of Bhutan.

MATERIAL AND METHODS

The authors observed the moths between 2013 and 2015 when conducting a moth survey in five districts (Bumthang, Dagana, Trongsa, Tsirang and Sarpang) of Bhutan. Details of the moth trapping sites in these districts with Global Positioning System (GPS) coordinates along with the map are provided in our previous publication (Irungbam et al. 2016). The moths

were collected using fluorescent bulbs on a white cloth sheet hanging and mercury vapor (MV) light traps at night (Irungbam et al. 2016).

Identification follows Hampson (1892), Holloway (1986), Solovyev & Witt (2009), Solovyev (2009a,b,c), Solovyev (2014) and Internet references (www.jpmoths.org). Photographs of cryptic species were sent to the third author for identification and confirmation of the species. Only a few individuals were collected as voucher specimens but genitalia were not studied. Thus, the species identifications were based on photographs of individuals and specimens.

RESULT AND OBSERVATIONS

After careful analysis and review of previous records and present collections, the present systematic list includes 51 species of moths belong to family Limacodidae recorded from Bhutan. The systematic list consists of the original records of Hampson (1892, 1895), Dudgeon (1900) and Dierl (1975), as well as species recorded during our surveys.

During the survey, 28 species of Limacodidae moths were encountered, photographed and voucher specimens collected from the study area. Six genera *Setora* Walker, 1855, *Tennya* Solovyev & Witt, 2009, *Iraga* Matsumura, 1927, *Vanlangia* Solovyev & Witt 2009, *Sansarea* Solovyev & Witt, 2009 and *Belippa* Walker, 1865 are reported for the first time from Bhutan, and 12 species *Setora postornata* (Hampson, 1900), *Setora fletcheri* Holloway, 1987, *Scopelodes testacea* Butler, 1886, *Thosea magna* Hering, 1931, *Miresa fulgida* Wileman, 1910, *Susica himalayana* Holloway, 1982, *Tennya propolia* (Hampson, 1900), *Iraga rugosa* (Wileman, 1911), *Cheromettia ferruginea* (Moore, 1877), *Vanlangia uniformis* (Hering, 1931), *Sansarea circulifera* (Hering, 1933) and *Belippa horrida* Walker, 1865 are new records for Bhutan.

Systematic checklist of the Limacodidae

Genus *Phlossa* Walker, 1858

Phlossa Walker, 1858, List Specimens lepid. Insects Colln Br. Mus. 15: 1673. Type species: *Phlossa fimbriares* Walker, 1858.

The genus *Phlossa* was erected by Walker in 1858 based on the type species *Phlossa fimbriares* Walker. The genus contains five species in the Oriental and Palearctic region (Wu & Fang 2008b). Male antenna have only one row of short pectinations. Labial palpus

short, porrect, terminal joint pendent. Hind tibia with two pairs of spurs. Forewing with veins R_{3+5} stalked, R_2 from the same basis, M_1 near to R_5 . Hindwing with veins R_5 and M_1 stalked, lower angle of cell slightly produced (Wu & Fang 2008b).

i. *Phlossa conjuncta* (Walker, 1855) (Image 1)

Limacodes conjuncta Walker, 1855, List Specimens lepid. Insects Colln Br. Mus. 5: 1150. Type locality: "North China".

Phlossa fimbriates Walker, 1858, List Specimens lepid. Insects Colln Br. Mus. 15: 1673.

Iragoides conjuncta, (Walker): Hering, 1931, in Seitz, Gross-Schmett. Erde 10: 709, fig. 88i.

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 7.vi.2013, 1 specimen to MV light, 18.vi.2015, 1 individual to MV light; Tsirang District, Damphu, 27°01'04.60"N & 90°07'18.18"E, 1,469m, 05.vi.2015, 2 specimens at MV light; Dagana district, Dagapela, 26°56'29.56"N & 89°55'22.06"E, 12.vii.2014, 3 specimens to MV light.

Distribution: Bhutan (Mendrelgang, Dagapela), Nepal (Yoshimoto 1994), India, Myanmar, Korea, Japan, China, Taiwan, northern Thailand, Vietnam, Laos (Wu & Fang 2008b; Solovyev & Witt 2009), Hong Kong (Kendrick 2002).

Remarks: Recorded in Bhutan by Dudgeon (1900). A minor pest on plants of the Euphorbiaceae and Rhamnaceae in many places of Vietnam (Solovyev et al. 2009) but their impact in Bhutan is not known and needs further investigation.

Genus *Thespea* Solovyev, 2014

Thespea Solovyev, 2014, Proc. Mus. Witt Munich 1: 57. Type species: *Neaera bicolor* Walker, 1855.

The genus *Thespea* was erected by Solovyev in 2014 based on *Neaera bicolor* Walker. Medium sized with green thorax. Labial palpus with small, rounded terminal segment. Male with antennae broadly bipectinate basally and shortly unipectinate distally; female antennae filiform. Hind tibia with two spurs. Forewing length 11–17.5 mm in males and 14–22 mm in females. Hindwings uniformly yellowish in both male and females (Solovyev 2014). The genus is very common and reported from Indian subregion to Sumatra and Java (Solovyev 2014).

i. *Thespea bicolor bicolor* (Walker, 1855) (Image 2)

Neaera bicolor Walker, 1855, List Specimens. lepid. Ins. Colln Br. Mus. 5: 1142. Type locality: "North India".

Latoia oryzae Cai, 1983, Acta Entomologica Sinica 26(4): 445, pl. 1:15, fig. 19. Type locality: "Rong Xian, Guangxi" [China].

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 8.vi.2013, 1 specimen to MV light; Sarpang District, Sarpang Tar, 26°52'0.23"N & 90°16'3.71"E, 345m, 12.vi.2014, 2 specimens to MV light.

Distribution: Bhutan (Mendrelgang, Sarpang Tar, Phuentsholing), northeastern India, Nepal, Myanmar, China, Thailand, Laos, Vietnam (Solovyev 2014).

Remarks: Recorded in Bhutan by Dudgeon (1900) and later by W. Dierl (1975) as *Parasa bicolor* and D.B. Chettri (2014) from Phuentsholing. The species is a minor pest on the plants of the family Poaceae and causes major damage on rice crops, sugarcane (defoliator) and bamboos (Solovyev et al. 2009).

Genus *Nephelimorpha* (Solovyev, 2014)

Nephelimorpha Solovyev, 2014, Proc. Mus. Witt Munich 1: 57. Type species: *Parasa argentilinea* Hampson, 1892.

The genus *Nephelimorpha* was erected by Solovyev in 2014 based on type species *Parasa argentilinea* Hampson, 1892. The genus is characterized by male antennae bipectinate proximally. Forewing 11–14 mm length in males and 15–17 mm in females. Thorax green dorsally and rounded; third segment of labial palps small. Forewing colour brown with large medial, triangular, green area, angles of which located near the wing base apex of the lower margin. Outer margin of this triangular area bordered by silver fascia; lower margin bordered by yellow fascia containing outer dark brown border. Forewing venation with medial stem not branched; vein R_1 sinuous; vein R_5 branched from R_3+R_4 (Solovyev 2014).

i. *Nephelimorpha argentilinea* (Hampson, 1892) (Image 3)

Parasa argentilinea Hampson, 1892, Fauna. Br. Ind. Moths 1: 389. Type locality: "Margharita, Assam" [India].

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 10.vi.2013, 2 specimens to MV light, 30.v.2014, 1 specimen to MV light; Tsirang District, Damphu, 27°01'04.60"N & 90°07'18.18"E, 1,469m, 05.vi.2014, 1 specimen to MV light; Dagana District, Dagapela, 26°56'29.56"N & 89°55'22.06"E, 1,597m, 1 specimen to MV light.

Distribution: Bhutan (Mendrelgang, Damphu, Dagapela), Nepal (Yoshimoto 1994), India, northern Myanmar, Vietnam (Solovyev 2014).

Remarks: Recorded in Bhutan by Dudgeon (1900). The species was recently shifted from genus *Parasa* to *Nephelimorpha* (Solovyev 2014).

Genus *Melinaria* Solovyev, 2014

Melinaria Solovyev, 2014, Proc. Mus. Witt Munich 1: 68. Type species: *Neaera repanda* Walker, 1855.

The genus *Melinaria* was erected by Solovyev in 2014 based on type series *Neaera repanda* Walker, 1855. The genus is characterised by male antennae broadly bipectinate basally and unipectinate distally. Thorax green dorsally, with a wide, brown dorsal band; third segment of labial palps short and rounded. Hind tibia bears two spurs. Forewing length 16–21 mm in males and 17–24 mm in females. Forewings green with distal and basal brown areas. Distal area separated from the medial green area by a silver band running almost from wing apex to 1/4 lower margin, nearly parallel to outer and lower wing margins. Basal area dark brown, expanding along costa and not reaching lower margin. Forewing venation with medial stem unbranched; vein R_5 branched from R_3+R_4 . Hindwings yellowish-brown. Abdomen yellowish-brown (Solovyev 2014).

i. *Melinaria repanda* (Walker, 1855) (Image 4)

Neaera repanda Walker, 1855, List Specimens lepid. Insects Colln Br. Mus. 5: 1141. Type locality: "North India".

Record: Bhutan: Tsirang District, Mendrelgang, 26°57.032'N & 90°06.874'E, altitude 1,247 m, 21.v.2013, 5 specimens to light, 28.vii.2014, 1 specimen by day; Dagana District, Dagapela, 26°56'29.56"N & 89°55'22.06"E, 1,597m, 12.vii.2014, 1 specimen to MV light; Sarpang District, Sarpang Tar, 26°52'0.23"N & 90°16'3.71"E, 345m, 12.vi.2014, 1 specimen to MV light.

Distribution: Bhutan (Mendrelgang, Dagapela), Nepal (Yoshimoto 1994), northeastern India, Myanmar (Solovyev 2014).

Remarks: The species is a new record for Bhutan.

Genus *Setora* Walker, 1855

Setora Walker, 1855, List Specimens lepid. Insects Colln Br. Mus. 5: 978 (key), 1069. Type species: *Setora nitens* Walker, 1855.

The genus *Setora* was erected by Walker in 1855 based on type species *Setora nitens* Walker. The genera is characterised by the antennae broadly bipectinate to one third. Medium sized body with bronzy brownish coloration. The forewing fasciae have a more or less oblique, curved post-medial converges at the costa with a usually diffuse, reflective, and often obscure sub-margin. In many species, there is a triangular zone of paler brown sub-apically on the costa (Holloway 1986). The genus is a new record for Bhutan.

i. *Setora postornata* (Hampson, 1900) (Image 5)

Setora sinensis Moore, 1877, Ann. Mag. nat. Hist. (4)

20: 93. Type locality: "Shanghai".

Thosea postornata ab. *Hampsoni* Strand, 1916, Arch. Naturg 82 A, 2: 89. Type locality: "Sikkim".

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, altitude 1,247m, 20.v.2013, 2 specimens came to light; Sarpang District, Sarpang, 26°52'0.23"N & 90°16'3.71"E, 345m, 27.iv.2015, 2 specimens to MV light.

Distribution: Bhutan (Mendrelgang, Sarpang), northeastern India (Hampson 1892), Nepal, southern China, Taiwan, Vietnam (Solovyev & Witt 2009).

Remarks: The species is a new record for Bhutan. It is a minor pest on the plants of Fagaceae, Platanaceae and Rutaceae (Solovyev et al. 2009). Pest status in Bhutan is unknown and needs further investigation.

ii. *Setora fletcheri* Holloway, 1987 (Image 6)

Setora fletcheri Holloway, 1987, Slug and Nettle Caterpillars: 82, pl. 21, 13. Type locality: "Rangoon".

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 13.v.2014, 3 specimens to MV light. 02.vi.2015, 1 specimen to MV light.

Distribution: Bhutan (Mendrelgang), Myanmar, Bangladesh, India, western and southern China, Thailand, central and southern Vietnam (Solovyev & Witt 2009).

Remarks: The species is a new record for Bhutan.

Genus *Praesetora* Hering, 1931

Praesetora Hering, 1931, in Seitz, Gross-Schmett. Erde 10: 672 (key), 711. Type species: *Setora divergens* Moore, 1879.

The genus *Praesetora* was erected by Hering in 1931 based on type series *Setora divergens* Moore. The genera is characterised by medium sized body with reddish-brown coloration. The forewings having two fine, straight fasciae darker reddish-brown, a sub marginal arising from the tornus that converges with or meets an oblique post medial at the costa. The post-medial arise sub basally on the dorsum. The fore tibia and coxa have an apical white patch (Holloway 1986).

i. *Praesetora* (cf) *divergens* (Moore, 1879) (Image 7)

Setora divergens Moore, 1879, Lep. Atkins.: 75, t. 3, f. 23. Type locality: "Darjiling".

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 06.v.2013, 2 specimens, 13.v.2014, 2 specimens to light. 10.v.2015, 1 specimen to MV light; Tsirang District, Damphu, 27°01'04.60"N & 90°07'18.18"E, 1,469m, 05.vi.2015, 2 specimens to MV light; Dagana district, Dagapela, 26°56'29.56"N & 89°55'22.06"E, 1,597m, 12.vii.2014, 1



Image 1. *Phlossa conjuncta* (Walker, 1855)



Image 2. *Thespea bicolor bicolor* (Walker, 1855)



Image 3. *Nephelimorpha argentilinea* Hampson, 1893



Image 4. *Melinaria repanda* (Walker, 1855)



Image 5. *Setora postornata* (Hampson, 1900) (female)



Image 6. *Setora fletcheri* Holloway, 1987



Image 7. *Praesetora divergens* Moore, 1879



Image 8. *Scopelodes vulpina* Moore, 1879



Image 9. *Scopelodes testacea* Butler, 1886



Image 10. *Squamosa ocellata* (Moore, 1879)



Image 11. *Chalcoscelides castaneipars* (Moore, 1865)



Image 12. *Altha nivea* Walker, 1862

specimen at MV light.

Distribution: Bhutan (Mendrelgang, Damphu, Dagapela), Nepal (Yoshimoto 1994), northeastern India (Hampson 1892), northern Thailand (Nakao 2014), central Vietnam (Solovyev & Witt 2009), Hong Kong (Kendrick 2002).

Remarks: The species was recorded earlier from Bhutan by Dudgeon (1900). Species identification is to be confirmed through genitalia study in order to separate the species reliably from *Setora* species.

Genus *Scopelodes* Westwood, 1841

Scopelodes Westwood, 1841, in Jardine, Naturalist's Libr. (Ed. 1) 33: 222. Type species: *Scopelodes unicolor* Westwood, 1841.

Bethura Walker, 1862, J. Proc. Linn. Soc. (Zool.) 6: 173. Type species: *Bethura minax* Walker, 1862.

The genus *Scopelodes* was erected by Westwood in 1841 based on the type species *Scopelodes unicolor* Westwood. The genera is characterised by medium to large sized moths. Antennae of the male bipectinate in basal half. Externally, they are distinguished from other genera by long second and third segment of labial palps with tufts of scales at the end. Wingspan about 40–78 mm length in males and 30–34 mm in females. The forewing is unicoloured with longitudinal or transverse shadows; the abdomen usually is yellow with transverse brown or black stripes. Strong sexual dimorphism in size, pattern and coloration is typical for most species (Wu & Fang 2009b; Solovyev & Witt 2009).

i. *Scopelodes vulpina* Moore, 1879 (Image 8)

Scopelodes vulpina Moore, 1879, Descr. New Ind. Lep. Colln. late Atkinson 1: 73. Type locality: "Darjiling".

Scopelodes tantula Swinhoe, 1904, Ann. Mag. nat. Hist. 7(14): 132. Type locality: "Khasia Hills".

Record: Bhutan: Tsirang District, Mendrelgang, 26°57.032'N & 90° 06.874'E, 1,247m, 22.vi.2013, 3specimens to MV light; Dagana district, Dagapela, 26°56'29.56"N & 89°55'22.06"E, 1,597m, 12.vii.2014, 1 specimen at MV light.

Distribution: Bhutan (Mendrelgang, Dagana, Dochula, Thimphu, Wangduephodrang), Nepal (Yoshimoto 1994), northeastern India, northern Thailand, northern Vietnam (Solovyev & Witt 2009).

Remarks: Recorded in Bhutan from Wangduephodrang by W. Dierl (1975). Later, the species was also recorded by D.B. Chettri (2014) from Dochula, Thimphu and Wangduephodrang.

ii. *Scopelodes testacea* Butler, 1886 (Image 9)

Scopelodes testacea Butler, 1886, Ill. Typ. Brit. Mus. Specimens Colln. Br. Mus. 6: 3. Type locality: "Silhet".

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 05.vi.2013, 1 specimen, 09.vi.2013, 2 specimens, 15.vi.2013, 1 specimen to light, 23.vii.2013, 2 specimens to light, 02.vi.2015, 2 specimens to MV Light; Dagana District, Dagapela, 26°56'29.56"N & 89°55'22.06"E, 1,597m, 12.vii.2014, 2 specimens at MV light.

Distribution: Bhutan (Mendrelgang), Nepal (Yoshimoto 1994), India, China, northern Thailand, Cambodia, central and southern Vietnam (Solovyev & Witt 2009).

Remarks: The species is a new record for Bhutan. It is a minor pest on the plants of family: Anacardiaceae, Ebenaceae, Lythraceae, Musaceae and Sapindaceae (Solovyev et al. 2009).

iii. *Scopelodes venosa* Walker, 1855

Scopelodes venosa Walker, 1855, List Lep.Het.Br. Mus. 5:1, 105.Type locality: "Silhet".

Scopelodes aurogrisea Moore, Lep.Ceyl. 2: 126, pl. 128, figs 1a-b.Type locality: [Ceylon].

Scopelodes ursina Butler, 1886, Ill. Het.Colln.Br. Mus. 6: 3, pl. 101, figs 7,8.Type locality: "Silhet".

Record: None.

Distribution: Bhutan, India, Nepal, Sri Lanka, China (Wu & Fang 2009c).

Remarks: Recorded in Bhutan by Dudgeon (1900), but misidentified, and confused with forms *ursina* Butler, 1866 and *testacea* Butler, 1866. The species was not recorded during our study.

iv. *Scopelodes contracta* Walker, 1855

Scopelodes contracta Walker, 1855, List Lep.Het.Br. Mus. 5: 1, 105.

Record: None.

Distribution: Bhutan, India, China, Taiwan, Japan (Wu & Fang 2009c).

Remarks: Recorded in Bhutan by Dudgeon (1900). The species was not recorded during our study.

v. *Scopelodes unicolor* Westwood, 1841

Scopelodes unicolor Westwood, 1841, in Jardine, Nat. Lib. 31: 222, Pl. 28, fig. 2.Type locality: "Java".

Scopelodes palpalis Walker, 1855, List SpecimensLepid.Insects Colln Br. Mus. 5: 1, 105.Type locality: "Java".

Dalcera palpigera Herrich-Schäffer, 1856, Samml. Aussereur. Schmett. 1: fig. 509.Type locality: "Java".

Bethura minax Walker, 1862, J. Linn. Soc. Lond. (Zool.) 6: 207.Type locality: "Sarawak".

Nyssia micacea Walker, 1865, List Specimens.lepid. Insects Colln Br. Mus. 32: 481. Type locality: "Java".

Scopelodes lutea Hering, 1931, in Seitz, Gross-Schmett. Erde 10: 690.Type locality: "Java".

Record: None.

Distribution: Bhutan, India, Myanmar, China, Indonesia (Wu & Fang 2009c), Sundaland (Holloway 1985), Hong Kong (Kendrick 2002).

Remarks: Recorded in Bhutan by Dudgeon (1900). The species was not recorded during our study. The host-plants recorded are *Theobroma* (Sterculiaceae), *Eugenia* (Myrtaceae) and many fruit trees (Kalshoven) (Holloway 1986). Piepers & Snellen (1900) recorded it on *Ricinus* (Euphorbiaceae), and it also feeds on *Nephelium* (Sapindaceae).

Genus *Squamosa* Bethune-Baker, 1908

Squamosa Bethune-Baker, 1908, Novit. zool. 15: 183. Type species: *Squamosa ferruginea* Bethune-Baker, 1908.

The genus *Squamosa* was erected by Bethune-Baker in 1904 based on the type species *Squamosa ferruginea* Bethune-Baker. The genera is characterised by medium to large size of adults with yellow ground colour. Male antennae bipectinate to middle and then serrate. Wingspan 31–42 mm length in males but female are unknown. The forewings have a characteristic large, rounded, silky brown, medial spot and very narrow, dark, curved external fascia; R_{3+5} stalked and R_2 separate. (Wu & Fang 2009a; Solovyev & Witt 2009)

i. *Squamosa ocellata* (Moore, 1879) (Image 10)

Monema ocellata Moore, 1879, Lep. Atkins.: 74. Type locality: "Darjiling".

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 31.v.2014, 1 specimen to MV light; Tsirang District, Damphu, 27°01'04.60"N & 90°07'18.18"E, 1,469m, 05.vi.2015, 5 specimens to MV light; Dagana District, Dagapela, 26°56'29.56"N & 89°55'22.06"E, 1,597m, 05.vi.2015, 4 specimens to MV light.

Distribution: Bhutan (Mendrelgang, Damphu, Dagapela, Chukha, Phuentsholing, Wangduephodrang), Nepal (Yoshimoto 1994), northeastern India, Myanmar (Hampson 1892).

Remarks: Recorded in Bhutan by Dudgeon (1900) and later it was also recorded from Wangdi-Dorju La (Wangduephodrang) by W. Dierl (1975) and D.B. Chettri (2014) from Chukha and Phuentsholing.

Genus *Chalcoscelides* Hering, 1931

Chalcoscelides Hering, 1931, in Seitz, Gross-Schmett. Erde 10: 686. Type species: *Miresa castaneipars* Moore, 1865.

The genus *Chalcoscelides* was erected by Hering in 1931 based on the type species *Miresa castaneipars*

Moore. The genus contains only the one species. The male antennae are bipectinate to the apex, the palps upcurved. The forewing facies over the distal half with a fine dark brown line; the veins also grade dark brown towards the margin and the hindwing is similar. The genus is characterized in facies by the rectangular dark brown zone, set obliquely in the wing, the basal corner of which is pale purple (Holloway, 1986). The genus is known from northeastern India to Sundaland (Solovyev & Witt, 2009).

i. *Chalcoscelides castaneipars* (Moore, 1865) (Image 11)

Miresa castaneipars Moore, 1865, Proc. zool. Soc. Lond.: 819. Type locality: "Darjeeling".

Chalcoscelides castaneipars Moore; Hering 1931: 686.

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 27.v.2013, 1 specimen to MV light, 25.vii.2013, 2 specimens to MV light; Tsirang District, Damphu, 27°01'04.60"N & 90°07'18.18"E, 1,469m, 05.vi.2015, 2 specimens to MV light.

Distribution: Bhutan (Mendrelgang, Damphu), Nepal (Yoshimoto 1994), northeastern India (Hampson 1892), Myanmar, Taiwan, Vietnam and Sundaland (Solovyev & Witt 2009).

Remarks: Recorded in Bhutan by Dudgeon (1900). The larvae of the species feed on *Citrus* sp. (Rutaceae), *Cinnamomum* sp. (Lauraceae), *Cassia* sp. (Fabaceae), *Spondias* sp. (Anacardiaceae), *Theobroma* sp. (Sterculiaceae), *Trevesia* sp. (Araliaceae) (Holloway 1986).

Genus *Altha* Walker, 1862

Altha Walker, 1862, J. Proc. Linn. Soc. 6: 173. Type species: *Altha nivea* Walker, 1862.

The genus *Altha* was erected by Walker in 1862 based on type species *Altha nivea* Walker 1862. The genus is characterized by small sized moth with wingspan 20–32 mm length; in male, the antennae are strongly bipectinate in basal third (Solovyev & Witt 2009). The moths have a white ground colour, shaded with orange or brown on the forewing. There are prominent dark dots at one third from the apex on the margin of both wings (Holloway 1986).

i. *Altha (Altha) nivea* Walker, 1862 (Image 12)

Altha nivea Walker, 1862, J. Proc. Linn. Soc. 6: 173. Type locality: [Sarawak].

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 26.vii.2013, 1 specimen to MV light; Sarpang District, Sarpang,

26°52'0.23"N & 90°16'3.71"E, 345m, 27.iv.2015, 2 specimens to MV light.

Distribution: Bhutan (Mendrelgang, Sarpang), India to Sundaland and Palawan, southern China, Taiwan (Solovyev & Witt 2009).

Remarks: Recorded in Bhutan by Dudgeon (1900). The species is a minor pest on the plants of family: Theaceae, Bombaceae, Lauraceae, Rutaceae, Annonaceae, Euphorbiaceae, Dipterocarpaceae, Combretaceae and Menispermaceae (Solovyev et al. 2009). Their pest status in Bhutan needs further investigation.

Genus *Thosea* Walker, 1855

Thosea Walker, 1855, List Specimens lepid. Insects Colln Br. Mus. 5: 979 (key), 1068. Type species: *Thosea unifascia* Walker, 1855.

Autocopa Meyrick, 1889, Trans. Ent. Soc. Lond.: 457. Type species: *Autocopa monoloncha* Meyrick, 1889.

Anzabe Walker, 1855, List Specimens lepid. Insects Colln Br. Mus. 5: 1093. Type species: *Anzabe sinensis* Walker, 1855.

Dasycomota Lower, 1902, Trans. Proc. R. Soc. Aust. 26: 220. Type species: *Dasycomota pyrrohaea* Lower, 1902.

The genus was erected by Walker in 1855 based on the type species *Thosea unifascia* Walker, 1855. The genus is characterized by mid-sized moths, male about 34mm wingspan length and female 20–41 mm length. Males usually have bipectinate antennae. Usually having grey forewings with a black discal spot with an oblique, dark, straight post medial distal to which the ground colour is darker (Holloway 1986; Solovyev & Witt 2009).

i. *Thosea magna* Hering, 1931 (Image 13)

Thosea magna Hering, 1931, in Seitz, Gross-Schmett. Erde 10: 711. Type locality: "Khasis" [India].

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 13.v.2014, 1 specimen to light; 20.v.2015 1 specimen to MV light, 02.vi.2015 1 specimen to MV light; Tsirang District, Damphu, 27°01'04.60"N & 90°07'18.18"E, 1,469m, 05.vi.2015, 5 specimens to MV light; Dagana district, Dagapela, 26°56'29.56"N & 89°55'22.06"E, 1,597m, 05.vi.2015, 4 specimens to MV light.

Distribution: Bhutan (Mendrelgang, Damphu, Dagapela), Nepal (Yoshimoto 1994), India, China (Wei & Wu 2008).

Remarks: The species is a new record for Bhutan.

ii. *Thosea sinensis* (Walker, 1855)

Anzabe sinensis Walker, 1855, List. Specimens lepid. Insects Colln Br. Mus. 5: 1093. Type locality: "Hong

Kong".

Susica taiwana Shiraki, 1913, Spec. Rep. Formosa Agric. Sta. 8: 401. Type locality: "Formosa (Taihoku)".

Record: None.

Distribution: Bhutan (Samtse), China, Taiwan, Korea, northern Thailand, Cambodia, northern and central Vietnam (Holloway et al. 1987; Solovyev & Witt 2009), Hong Kong (Kendrick 2002).

Remarks: Recorded in Bhutan from Samchi (Samtse) at 300m by W. Dierl (1975). Not recorded during the present study.

Genus *Hindothosea* Holloway, 1987

Hindothosea Holloway, 1987, in Cock et al. (ed), Slug and Nettle Caterpillars: 68. Type species: *Thosea cervina* Moore, 1877.

The genus was erected by Holloway in 1987 based on the type species *Thosea cervina* Moore, 1877. The moth of the genus resembles *Thosea* in facies but has the post-medial less oblique, edged paler on the exterior rather than on the interior. In the male genitalia the valve is simple, lacking even the vestige of a furca, and the uncus apex has a ventral spur. The female genitalia are of the crescent-signum type but the eighth segment is weak, not expanded as in *Thosea* (Holloway et al. 1987).

i. *Hindothosea cervina* (Moore, 1877)

Thosea cervina Moore, 1877, Ann. Mag. Nat. Hist. (4) 20: 348. Type locality: "Ceylon".

Thosea duplexa Moore, 1883, Lepidoptera of Ceylon 2: 130. Type locality: "Ceylon".

Record: None.

Distribution: Bhutan, India, Bangladesh, Sri Lanka, Myanmar (Holloway et al. 1987)

Remarks: Recorded for the first time in Bhutan by Dudgeon (1900). The species was not recorded during our study. The larva feeds on *Albizia* sp. and tea (Holloway et al. 1987).

Genus *Griseothosea* Holloway, 1986

Griseothosea Holloway, 1986, Malayan Nature Journal 1: 123. Type species: *Nyssia cruda* Walker, 1862.

Medium-sized moths with greyish-brown ground colour. The forewing patterns are characteristic, with a black discal spot and three darker diffuse fasciae at right angle to dorsum of forewing; the external fascia is entire, zig-zag; usually forewing is darker basally.

i. *Griseothosea fasciata* (Moore, 1888)

Aphendala fasciata Moore, 1888, Proc. zool. Soc. Lond.: 403. Type locality: "Dharmasala".

Record: None.

Distribution: Bhutan, India, Nepal, southern and western China, Taiwan, Thailand, northern Vietnam (Solovyev & Witt 2009), Hong Kong (Kendrick 2002).

Remarks: Recorded in Bhutan by Dudgeon (1900). The species was not recorded during our study.

Genus *Phocoderma* Butler, 1886

Phocoderma Butler, 1886, Illust. Lepid. Heterocera Br. Mus. 6: 4. Type species: *Gastropacha velutina* Kollar, 1844.

The genus *Phocoderma* was erected by Butler in 1886 based on the type individual *Gastropacha velutina* Kollar. The genus includes large moths with wingspan of 51–72 mm length; silky-brown ground colour. Antennae bipectinate in males and filiform in females. The forewing fascia is characteristic, with a darker sub marginal curved round parallel to the margin, and the area basal to this divided by an oblique line with an angle sub apically (Solovyev 2008).

i. *Phocoderma velutina* (Kollar, 1844) (Image 14)

Gastropacha velutina Kollar, 1844, in Hügel, Kaschmir und das Reich der Siek 4 (part 2), Aufzählung und Beschreibung der von Freiherrn Carl v. Hügel auf seiner Reise durch Kaschmir und das Himalayagebirge gesammelten Insecten: 473. Type locality: [north India] "Himal., Massuri".

Natada rugosa Walker, 1855: 1109. Type locality: "Scinde?".

Natada velutina Kollar; Hampson 1892: 382; Hering 1933: 343.

Phocoderma velutina Kollar; Butler 1886: 4; Leech 1899: 103; van Eecke 1925: 27; Holloway 1982: 40, pl. 2 fi g. 24; Holloway 1986: 100, pl. 7 figs 163, 164, 168; Holloway 1990: 49, pl. 2 fi g. 25; Yoshimoto 1994: 86.

Phocoderma velutinum Kollar; Hering 1931: 720.

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 08.vi.2013, 1 specimen to light; Sarpang District, Sarpang Tar, 26°52'0.23"N & 90°16'3.71"E, 345m, 12.vi.2014, 2 specimens to MV light.

Distribution: Bhutan (Mendrelgang, Sarpang Tar), Nepal (Yoshimoto 1994), India, Myanmar, Thailand, Malaysia, Borneo, Sumatra (Solovyev 2008).

Remarks: The larvae of this species feed on the plants of Anacardiaceae, Bombacaceae, Combretaceae, Euphorbiaceae, Fabaceae, Sapindaceae and Theaceae but they are not considered as important pest species (Solovyev et al. 2009). The pest status in Bhutan is unknown and needs further investigation.

Genus *Miresa* Walker, 1855

Miresa Walker, 1855, List Specimens.lepid. Insects Colln. Br. Mus. 5: 1103, 1123. Type species: *Nyssia albipuncta* Herrich-Schäffer, [1854].

The genus *Miresa* was erected by Walker in 1855 based on the type species *Nyssia albipuncta* Herrich-Schäffer. The moths are medium-sized with yellowish brown and pale ground colour. The forewings with S-shaped post-medial fascia, the medial spot, post-medial and external fasciae are silver coloured (Solovyev & Witt 2009; Solovyev & Wu 2011). The antennae are bipectinate up to basal half and the palps are somewhat curving upward with the third segment inconspicuous. The genus is found from India to Sundaland (Holloway 1986).

i. *Miresa bracteata* Butler, 1880 (Image 15)

Miresa bracteata Butler, 1880, Ann. Mag. Nat. Hist. (5) 6: 64. Type locality: "Darjeeling".

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 29.v.2013, 2 specimens, 30.v.2013, 3 specimens to light; Tsirang District, Damphu, 27°01'04.60"N & 90°07'18.18"E, 1,469m, 05.vi.2015, 3 specimens to MV light; Dagana District, Dagapela, 26°56'29.56"N & 89°55'22.06"E, 1,597m, 05.vi.2015, 4 specimens to MV light.

Distribution: Bhutan (Mendrelgang, Damphu, Dagapela, Phuentsholing, Thimphu, Wangduephodrang), India, Nepal, southwestern China, Thailand, Malaysia, Sundaland (Wu & Solovyev 2011).

Remarks: The species was very common in all the study areas. Recorded in Bhutan between Thimphu to Phuentsholing (1,680m) and Wangduephodrang (1,700–2,000 m) by W. Dierl (1975).

ii. *Miresa fulgida* Wileman, 1910 (Image 16)

Miresa fulgida Wileman, 1910, Entomol. 43: 192. Type locality: "Kanshirei (1000 ft.)" [Taiwan].

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 03.vi.2013, 3 specimens to light; Tsirang District, Damphu, 27°01'04.60"N & 90°07'18.18"E, 1,469m, 05.vi.2015, 5 specimens to MV light; Dagana District, Dagapela, 26°56'29.56"N & 89°55'22.06"E, 1,597m, 05.vi.2015, 4 specimens to MV light.

Distribution: Bhutan (Mendrelgang, Damphu, Dagapela), China, southern Japan, Vietnam (Wu & Solovyev 2011).

Remarks: The species is a new record for Bhutan.

iii. *Miresa decedens* Walker, 1855

Miresa decedens Walker, 1855, List Specimens lepid. Ins. Colln Br. Mus. 5:1125. Type locality: "North India".

Record: None.

Distribution: Bhutan (Dudgeon 1900).

Remarks: Recorded in Bhutan by Dudgeon (1900). The species was not recorded during our study.

Genus *Susica* Walker, 1855

Susica Walker, 1855, List Specimens. lepid. Insects Colln Br. Mus. 5: 1103 (key), 1113. Type species: *Susica pallida* Walker, 1855.

The genus *Susica* was erected by Walker in 1855 based on the type species *Susica pallida* Walker, 1855. The genus includes medium-sized moths. The ground colour of the wing is greyish-brown. The male antennae are broadly bipectinate and simple in females. The forewings are short, broad and rounded, with dark curved transverse medial fascia and sinusoidal external fascia near apex, usually with sparse dark scales and with distinct medial dark spot. Hind tibia with two pairs of spurs in both sexes. Wingspan about 25mm in males and 48mm in females (Hampson 1892; Solovyev & Witt 2009).

i. *Susica himalayana* (Holloway, 1982) (Image 17)

Susica himalayana Holloway, 1982, in Barlow, Introd. moths SE Asia: 186. Type locality: "Sikkim".

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 07.vi.2013, 3 specimens to light. 02.vi.2015, 2 specimens at MV light.

Distribution: Bhutan (Mendrelgang), northeastern India (Holloway 1982), Nepal (Yoshimoto 1994).

Remarks: The species is a new record for Bhutan.

ii. *Susica* sp. A (Image 18)

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 07.vi.2013, 1 specimen to light.

Distribution: Bhutan (Mendrelgang).

Remarks: The species identity could not be confirmed beyond the genus level due to lack of voucher specimen for genitalia examination.

iii. *Susica pallida* Walker, 1855

Susica pallida Walker, 1855, List Specimens lepid. Insects. Colln.Br. Mus. 5:1114. Type locality: [India].

Record: None

Distribution: Bhutan (Dudgeon 1900), India, Nepal (Cotes & Swinhoe 1887)

Remarks: Recorded in Bhutan by Dudgeon (1900). The species was not recorded during our study.

Genus *Tennya* Solovyev & Witt, 2009

Tennya Solovyev & Witt, 2009, Entomofauna 16: 63. Type species: *Narosa propolia* Hampson, 1900.

The genus *Tennya* was erected by Solovyev & Witt in 2009 based on the type species *Narosa propolia*

Hampson. The genus is characterised by small moths; 19–24 mm wingspan in males and 13–15 mm viz. 26–30 mm in females. The male antennae are filiform and simple in females. The females have more elongate forewings than the males. The outer margin of forewings has black spots, decorated with white colour between veins (Solovyev & Witt 2009). The genus is a new record for Bhutan.

i. *Tennya propolia* (Hampson, 1900) (Image 19)

Narosa propolia Hampson, 1900, Journ. Bomb. Soc. 13: 232. Type locality: "Sikhim, 2,800".

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 08.v.2013, 1 specimen to light; Tsirang District, Damphu, 27°01'04.60"N & 90°07'18.18"E, 1,469m, 05.vi.2015, 5 specimens to MV light; Dagana District, Dagapela, 26°56'29.56"N & 89°55'22.06"E, 1,597m, 05.vi.2015, 4 specimens to MV light.

Distribution: Bhutan (Mendrelgang, Damphu, Dagapela), India, Nepal, China, Vietnam (Solovyev & Witt 2009).

Remarks: The species is a new record for Bhutan.

Genus *Aphendala* Walker, 1865

Aphendala Walker, 1865, List Specimens lepid. Insects Colln Br. Mus. 32: 494. Type species: *Aphendala transversata* Walker, 1865.

The genus *Aphendala* was erected by Walker in 1865, based on the type species *Aphendala transversata* Walker. At present, the genus contains more than 20 species in the Oriental region (Holloway 1986, 1987; Yoshimoto 1994). The genus can be easily distinguished by male antenna bipectinate and filiform in female. Forewing with R_2 separate and R_{3+5} stalked. Hindwing with M_1 and R_s stalked (Solovyev & Witt 2009).

i. *Aphendala imitabilis* (Hering, 1931) (Image 20)

Thosea imitabilis Hering, 1931, in Seitz, Gross-Schmett. Erde 10: 713. Type-locality: [northern India] "Pedong (Sikkim)".

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 26.viii.2014, 1 specimen to light; Dagana District, Dagapela, 26°56'29.56"N & 89°55'22.06"E, 1,597m, 2 specimens to MV light.

Distribution: Bhutan (Mendrelgang, Dagapela, Thimphu, Paro), eastern Afghanistan, Pakistan, northern India, Nepal, China, Myanmar, Sri Lanka (Wu & Fang 2008; Solovyev 2010).

Remarks: The species was recorded from Thimphu and Paro (2,300m) by W. Dierl (1975). The specimens were collected in late April, early May, mid June, July,



© Jatishwor Singh Irungbam
Image 13. *Thosea magna* Hering, 1931



© Meenakshi Singh Chib
Image 14. *Phocoderma velutina* (Kollar, 1844)



© Jatishwor Singh Irungbam
Image 15. *Miresa bracteata* Butler, 1880



© Meenakshi Singh Chib
Image 16. *Miresa fulgida* Wileman, 1910



© Jatishwor Singh Irungbam
Image 17. *Susica himalayana* Holloway, 1982



© Meenakshi Singh Chib
Image 18. *Susica* sp. A



© Meenakshi Singh Chib
Image 19. *Tennya propolia* (Hampson, 1900)



© Meenakshi Singh Chib
Image 20. *Aphendala imitabilis* (Hering, 1931)



© Meenakshi Singh Chib
Image 21. *Iraga rugosa* (Wileman, 1911)



© Meenakshi Singh Chib
Image 22. *Monema coralina* Dudgeon, 1895



© Jatishwor Singh Irungbam
Image 23. *Cheromettia ferruginea* (Moore, 1877)



© Jatishwor Singh Irungbam
Image 24. *Cheromettia apicata* (Moore, 1879),

and early November at altitudes of 1,500–2,700 m in all its distribution range (Solovyev & Witt 2009).

ii. *Aphendala cana* (Walker, 1865)

Parasa cana Walker, 1865, List Specimens Lepid. Ins. Colln Br. Mus. 32: 484. Type-locality: "South Hindostan". Holotype (by monotypy):

Thosea barikoti Daniel, 1965, Z. Wien.Ent. Ges. 50: 140. Type-locality: "Afghanistan, Nuristan, 25km N v. Barikot, 1800m".

Record: None.

Distribution: Bhutan (Dudgeon 1900), Nepal (Yoshimoto 1994), Sri Lanka (Light 1927), eastern Afghanistan, Pakistan, India (Solovyev 2010), Taiwan (Inoue 1992).

Remarks: Recorded in Bhutan by Dudgeon (1900). The species was not recorded during our study. A pest on tea plants (Solovyev 2010).

iii. *Aphendala unicolor* (Moore, 1859)

Parasa unicolor Moore, 1859, Cat.Lepid. Ins. Mus. Nat. Hist. East-India House 1: 415. Type-locality: "N. India".

Aphendala transversata Walker, 1865, List Specimens lepid. Insects. Colln. Br. Mus. 32: 495. Type-locality: "North Hindostan".

Aphendala tripartita Moore, 1884, Trans. Ent. Soc. London: 376. Type-locality: "Manpuri"[northern India].

Thosea phaeobasis Hering, 1935, Stylops 4: 86. Type-locality: [south-western India] "S. Mangalore, 400, Madras".

Thosea discipunctata Hering, 1931, in Seitz, Gross-Schmett. Erde 10: 713. Type-locality: "Palli Hill, Bandora"[south-western India].

Aphendala mechensis Yoshimoto, 1994, Moths of Nepal 3, Tinea 14 (Suppl.1): 88. Type-locality: "Mechi, Godok"[Nepal].

Record: None

Distribution: Bhutan (Dudgeon 1900), Nepal (Yoshimoto 1994), India (Solovyev 2010).

Remarks: Recorded in Bhutan by Dudgeon (1900). The species was not recorded during our study.

Genus *Iraga* Matsumura, 1927

Iraga Matsumura, 1927, J. Coll. Agric. Hokkaido imp. Univ.19: 89. Type species: *Tetraphleps* (?) *rugosa* Wileman, 1911.

The genus *Iraga* was erected by Matsumura in 1927 based on type species *Tetraphleps* (?) *rugosa* Wileman. The genus is represented by only one species. The moths are brown; broad, smooth yellowish dorsal band at head, thorax and abdomen; antennae filiform in males (Solovyev & Witt 2009).

i. *Iraga rugosa* (Wileman, 1911) (Image 21)

Tetraphleps (?) *rugosa* Wileman, 1911, Entomol. 44: 205. Type locality: "Kanshirei (1000 ft.)" [Taiwan].

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 13.vi.2013, 1 specimento light, 23.vi.2015, 2 specimens to light; Dagana District, Dagapela, 26°56'29.56"N & 89°55'22.06"E, 1,597m, 12.vii.2014, 2 specimens to MV light.

Distribution: Bhutan (Mendrelgang, Dagapela), Southern China, Taiwan, Cambodia, northern Laos, northern Vietnam (Solovyev & Witt 2009).

Remarks: The species is a new record for Bhutan.

Genus *Monema* Walker, 1855

Monema Walker, 1855, List Specimens lepid. Insects Colln Br. Mus. 5: 1102, 1112. Type species: *Monema flavescens* Walker, 1855.

Cnidocampa Dyar, 1905, Proc. U. S. Nat. Mus. 28: 950. Type species: *Monema flavescens* Walker, 1855.

The genus *Monema* was erected by Walker in 1855, based on the type species, *Monema flavescens* Walker. The moths have a yellowish body and are medium-sized. Male have filiform antennae and thicker than in female. Labial palpi extremely long. Forewings with R₃ + R₄ stalked from R₅ and R₂ stalked with their stem. Hindwings with M₁ and Rs stalked. Forewings with two narrow brown fasciae running from apex to 3/4 and 1/3 of inner margin respectively; basal part of forewing bordered by proximal fascia yellow, rest brown. Hind tibiae with two pairs of spurs (Pan et al.2013).

i. *Monema coralina* Dudgeon, 1895 (Image 22)

Monema coralina Dudgeon, 1895, Trans. Ent. Soc. Lond.: 290. Type locality: "Bhután".

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 22.viii.2013, 1 specimento light; Sarpang District, Sarpang Tar, 26°52'0.23"N & 90°16'3.71"E, 345m, 12.vi.2014, 2 specimens to MV light.

Distribution: Bhutan (Mendrelgang, Sarpang Tar), Nepal (Inoue 1970), China (Pan et al. 2013).

Remarks: Recorded in Bhutan by Dudgeon (1900).

Genus *Cheromettia* Moore, 1883

Cheromettia Moore, 1883, Lepid. Ceylon 2: 133. Type species: *Belippa ferruginea* Moore, 1877.

The genus *Cheromettia* was erected by Moore in 1883, based on the type species *Belippa ferruginea* Moore. The species of genus are sexually dimorphic in forewing pattern and coloration. The males are rufous brown or blackish with broadly bipectinate antennae

only in the basal quarter. The male forewings are narrow, elongate, with black apex; the hind wings are medially transparent in some taxa. The females are paler, rufous yellow; the forewings are broader than in males, also with black apex (Solovyev & Witt 2009). Moreover, there are no strong characters to separate the species using females. Thus, the identification of *Cheromettia* sp. is very difficult without genitalia dissection of voucher specimens. The genus is known from India subregion (Holloway 1986), southern China, Vietnam, northern Thailand, peninsular Malaysia and Sundaland (Solovyev & Witt 2009).

i. *Cheromettia ferruginea* (Moore, 1877) (Image 23)

Belippa ferruginea Moore, 1877, Ann. Mag. Nat. Hist. 4(20): 348. Type locality: "Ceylon".

Record: Bhutan: Tsirang District, Damphu, 27°14.56'N & 90°718.18'E, 1,469m, 30.v.2014, 2 specimens to light.

Distribution: Bhutan (Damphu), India, Myanmar and Sri Lanka (Hampson 1892; Holloway 1986).

Remarks: The species is a new record for Bhutan.

ii. *Cheromettia apicata* (Moore, 1879) (Image 24)

Belippa apicata Moore, 1879, Lep. Atkins.: 75. Type locality: "Darjeeling".

Parasa laleana Moore, 1859, Ann. Mag. Nat. Hist. (4)20: 417. Type locality: "N. India".

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 20.v.2013, 2 specimens to MV light; Tsirang District, Damphu, 27°01'04.60"N & 90°07'18.18"E, 1,469m, 10.iv.2015, 1 specimen to light; Sarpang District, Sarpang Tar, 26°52'0.23"N & 90°16'3.71"E, 345m, 1 specimen to MV light.

Distribution: Bhutan (Mendrelgang, Damphu, Sarpang Tar, Phuentsholing), Nepal (Yoshimoto 1994), northeastern India (Hampson 1892; Holloway 1986).

Remarks: Recorded in Bhutan by Dudgeon (1900). Later the species was also recorded from Phuentsholing at 200–500 m (Dierl 1975).

Genus *Vanlangia* (Solovyev & Witt, 2009)

Vanlangia Solovyev & Witt, 2009, Entomofauna 16: 173. Type species: *Thosea castanea* Wileman, 1911.

The genus *Vanlangia* was erected by Solovyev & Witt in 2009 based on the type species *Thosea castanea* Wileman. The genus is characterized by small sized moth with wingspan 21–29 mm length. The male antennae are bipectinate with short rami. The forewings with pale medial fascia with darker border and greyish distal semicircular field near apex. The forewing with vein R_5 stalked with R_3+R_4 ; the medial stem is well developed, not branched distally (Solovyev & Witt 2009). The genus

is widely distributed in China and northern Vietnam (Solovyev & Witt 2009). The genus is a new record for Bhutan.

i. *Vanlangia* cf. *uniformis* (Hering, 1931) (Image 25)

Iragoides uniformis Hering, 1931, in Seitz, Gross-Schmett. Erde. 10: 710. Type locality: "Lung-tao-shan".

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 25.vii.2013, 1 specimen to light; Tsirang District, Damphu, 27°01'04.60"N & 90°07'18.18"E, 1,469m, 05.vi.2015, 5 specimens to MV light; Dagana District, Dagapela, 26°56'29.56"N & 89°55'22.06"E, 1,597m, 05.vi.2015, 4 specimens to MV light.

Distribution: Bhutan (Mendrelgang, Damphu, Dagapela), China, northern Vietnam (Solovyev & Witt 2009).

Remarks: The species is a new record for Bhutan. The recorded individual is near to *V. uniformis* but we could not confirm the species identity based on photographs alone. Voucher specimen for genitalia dissection is not available.

Genus *Sansarea* Solovyev & Witt, 2009

Sansarea Solovyev & Witt, 2009, Entomofauna 16: 173. Type species: *Trichogyia circulifera* Hering, 1933.

The genus *Sansarea* was erected by Solovyev & Witt in 2009 based on the type species *Trichogyia circulifera* Hering. The genus is characterised by middle-sized moths with forewing 22–28 mm length wingspan in males, 14–30 mm in females. The ground colour is brownish-ochre. The male antennae are filiform. The forewing with large post medial dark brown rounded spot with post medial, ante medial and not well-defined external zigzag fasciae. The outer marginal area of forewing bears small dark spots on the veins. The hindwing is dark with bright fringe and dorsal margin (Solovyev & Witt 2009). The genus is a new record for Bhutan.

i. *Sansarea* cf. *circulifera* (Hering, 1933) (Image 26)

Trichogyia circulifera Hering, 1933, in Seitz, Gross-Schmett. Erde, Suppl. 2: 207. Type locality: "Kwanshien, China".

Record: Bhutan: Tsirang District, Damphu, 27°14.56'N & 90°718.18'E, altitude 1,469m, 30.v.2014, 2 specimens to light.

Distribution: Bhutan (Damphu), Nepal, Taiwan, Japan (Yoshimoto 1993).

Remarks: The species is a new record for Bhutan. The recorded individual is near to *S. circulifera* but we could not confirm the species identity from the photograph alone. Voucher specimen for genitalia dissection is not



Image 25. *Vanlangia* (cf) *uniformis* (Hering, 1931)



Image 26. *Sansarea* (cf) *circulifera* (Hering, 1933) male



Image 27. *Belippa horrida* Walker, 1865



Image 28. *Caissa fasciatum* (Hampson, 1893)

available.

Genus *Belippa* Walker 1865

Belippa Walker, 1865, List Specimens lepid. Insects Colln Br. Mus. 32: 508. Type species: *Belippa horrida* Walker, 1865.

Contheyloides Matsumura, 1931, Ins. Mats. 5: 104. Type species: *Contheyloides boninensis* Matsumura, 1931.

The genus *Belippa* was erected by Walker based on the type species *Belippa horrida* Walker. The moths of the genus are characterised by medium-sized moths with wingspan 28–35 mm. The congeners differ from each other externally, but are associated together by the similar male genitalia in which the juxta is divided in two flattened lateral parts with dorsal row of large spurs and cranial finger-shaped process (Solovyev & Witt 2009).

i. *Belippa horrida* Walker, 1865 (Image 27)

Belippa horrida Walker, 1865, List Specimens lepid. Insects Colln Br. Mus. 32: 509. Type locality: "North

China".

Cheromettia formosaensis Kawada, 1930, J. Imp. Agric. Expt. Sta. Nishigahara 1: 257. Type locality: "Horisya in Formosa".

Record: Bhutan: Tsirang District, Mendrelgang, 26°57'0.57"N & 90°06'51.78"E, 1,247m, 10.v.2015, 3 specimens to MV light; Damphu, 27°01'04.60"N & 90°07'18.18"E, 1,469m, 14.v.2015, 1 specimen to light.

Distribution: Bhutan (Mendrelgang, Damphu), India, Japan, China, Taiwan, Thailand, Laos, northern Vietnam (Solovyev & Witt 2009).

Remarks: The species is a new record for Bhutan.

Genus *Caissa* Hering, 1931

Caissa Hering, 1931, in Seitz, Gross-Schmett. Erde. 10: 670 (key), 700. Type species: *Caissa caissa* Hering, 1931.

The genus *Caissa* was erected by Hering based on the type species *Caissa caissa* Hering. The moths of the genus are characterised by medium-sized moths with forewing length of 10–15 mm in males and 13–15

mm in females. Male antennae filiform, dark discal spot in forewing and dark tornal spot in hindwing. The hindwings always have a dark brown, slightly fuzzy, spot near the tornus (Solovyev & Saldaitis 2013). The genus ranges across Southeast Asia, India, Nepal, Myanmar, China, Thailand and Vietnam (Solovyev & Witt 2009; Solovyev & Saldaitis 2013).

i. *Caissa fasciatum* (Hampson, 1893) (Image 28)

Ceratonema fasciatum Hampson, 1893, Fauna Br. India (Moths) 1: 394. Type locality: "Nágas, 6000 feet" [India].

Record: Bhutan: Tsirang District, Mendrelgang, 26°57.032'N & 90° 06.874'E, 1,247m, 02.vi.2015, 2 specimens to light. Dagana District, Dagapela, 26°56'29.56"N & 89°55'22.06"E, 1,597m, 12.vii.2014, 1 specimen to MV light.

Distribution: Bhutan (Mendrelgang, Dagapela), Nepal, India (Hampson 1892).

Remarks: Recorded in Bhutan by Dudgeon (1900).

Genus *Parasa* Moore, 1859 sensu lato

Parasa Moore, 1859, Cat. lep. Ins. Mus. East India Coy 2: 413. Type species: *Neaera chloris* Herrich-Schäffer, 1854, by subsequent designation by Fletcher & Nye, 1982: 120. = *Neaera* Herrich-Schäffer, 1854 *Samml. aussereurop. Schmett.* 1 (1): wrapper, pl. 37, figs 176, 177. Type species: *Neaera chloris* Herrich-Schäffer, 1854 by subsequent designation by Fletcher & Nye, 1982: 120. A junior homonym of *Neaera* Robineau-Desvoidy, 1830 (Insecta, Diptera) = *Callochloa* Packard, 1864, *Proc. ent. Soc. Philad.* 3: 339. Type species: *Callochloa vernata* Packard, 1864, by monotypy.

= *Neaerasa* Staudinger, 1892, *Mém. Lépid.* 6: 298. Type species: *Neaera chloris* Herrich-Schäffer, 1854, by subsequent designation by Fletcher & Nye 1982: 120.

The genus *Parasa* sensu lato includes small to large sized moths, joined together under the single character; presence of green colour on the wings or body. The larvae of known species belong to the nettle-type. The genus is thoroughly revised by Solovyev & Witt (2009), Solovyev (2014).

i. *Parasa himalepida* Holloway, 1987

Parasa himalepida Holloway, 1987, *Slug and Nettle Caterpillars*: 31, pls 4, 5, 19. Type locality: "Upper Burma, Htawgaw, 6000 ft".

Record: None.

Distribution: Bhutan, Nepal, northeastern India, Myanmar, China (Solovyev 2014).

Remarks: Recorded in Bhutan by Solovyev 2014. The species was not recorded during the study.

ii. *Parasa pastoralis* Butler, 1885

Parasa pastoralis Butler, 1885, *Ann. Mag. nat. Hist.* 6(5): 63. Type locality: [Bhutan].

Parasa pastoralis tonkinensis Hering, 1931, in Seitz, *Gross-Schmett. Erde* 10: 696. Type locality: "Tonkin".

Record: None.

Distribution: Bhutan (Dudgeon 1900), Nepal (Inoue 1970), Pakistan, India, Myanmar, southern China, Taiwan, Thailand, Vietnam, Borneo, Sumatra, Java, Bali (Solovyev & Witt 2009), Hong Kong (Kendrick 2002).

Remarks: Recorded in Bhutan by Dudgeon (1900). The species was not recorded during our study.

Genus *Aergina* Solovyev, 2014

Aergina Solovyev, 2014, *Proc. Mus. Witt Munich* 1: 59. Type species: *Limacodes hilaris* Westwood, 1848.

The genus includes medium-sized moths. Before 2014 the members of the genus were placed in *Parasa* Moore, 1859. The head, thorax and forewings are green (however, the green pattern on the forewing can be lost in some species); the moths have highly diagnostic basal pentagon-shaped brown spot on the forewings.

i. *Aergina hilaris* (Westwood, 1848)

Limacodes hilaris Westwood, 1848, *Cab. Orient. Ent.* 50, t. 24: fig. 3. Type locality: "central India".

Parasa hockingii Moore, 1888, *Proc. Zool. Soc. Lond.*: 403. Type locality: "Kangra Valley (3000 feet)".

Parasa argalea West, 1937, *Ann. Mag. nat. Hist.* 10(10): 80, pl. II: fig. 7. Type locality: "India, Jubbulpore".

Record: None.

Distribution: Bhutan (Dudgeon 1900), Pakistan, India, Nepal.

Remarks: Recorded in Bhutan by Dudgeon (1900). The species was not recorded during our study.

Genus *Birhamiodes* Hering, 1931

Birhamiodes Hering, 1931, in Seitz, *Gross-Schmett. Erde* 10: 671 (key), 703. Type species: *Hyblaea junctura* Walker, 1865.

The genus was erected by Hering based on the type species *Hyblaea junctura* Walker. The genus is externally characterized by medium sized, reddish-brown moths. The forewing pattern is characteristic, includes transverse ante-medial fascia from 1/2 costa to 1/3 dorsum; the basal area bordered by this fascia is darker than the rest of the forewing; the external fascia is shaded, and borders the lighter apical part of the forewing; the medial fascia is shaded, perpendicular to dorsum (Solovyev & Witt 2009). The genitalia have an asymmetrically armed juxta or furca (Holloway et al. 1987).

i. *Birhamiodes junctura* (Walker, 1865)

Hyblaea junctura Walker, 1865, List. Specimens lepid. Insects Colln. Br. Mus. 33: 857. Type locality: "Cambodia".

Record: None.

Distribution: Bhutan (Wangduephodrang), India, Andaman Islands, Myanmar, Cambodia, Thailand, central and southern Vietnam, Bali, Borneo, Sumatra, Java (Dierl 1975; Solovyev & Witt 2009).

Remarks: Recorded in Bhutan from Wangduephodrang (1,300m) by Dierl (1975). The species was not recorded during our study.

Genus *Prapata* Holloway, 1990

Prapata Holloway, 1990, Heterocera Sumatrana 6: 40. Type species: *Prapata bisinuosa* Holloway, 1990.

The genus is well defined externally by obscure blackish-brown coloration; the hindwings are pale, grayish-brown. The forewings with characteristic black discal streak. The male antennae are broadly bipectinate over the basal third. All species extremely similar to each other in appearance, therefore the morphology of male genitalia are diagnostic (Solovyev & Witt 2009)

i. *Prapata scotopepla* (Hampson, 1900)

Miresa scotopepla Hampson, 1900, Journ. Bom. Soc. 13: 231. Type locality: "Sikhim, 5,000".

Record: None.

Distribution: Bhutan (Thimphu), Nepal (Yoshimoto 1994).

Remarks: Recorded in Bhutan from Thimphu as *Miresa scotopepla* by Dierl (1975). The species was not recorded during our study.

Genus *Cania* Walker, 1855

Cania Walker, 1855, List Specimens lepid. Insects Colln Br. Mus. 5: 1159 (key), 1177. Type species: *Cania sericea* Walker, 1855.

The genus includes medium-sized moths with yellowish ground colour. Usually, the species of the genus are characterized by slightly curved, shaded darkish post-medial and medial fasciae of the forewings. The antennae are bipectinate in males. The larvae are of the nettle-type, semiovoid with long lateral and short subdorsal scoli. The genus is similar to *Rhamnosa* Fixsen, 1887 but differs by the absence of the tornal incision of the forewings (Solovyev & Witt 2009).

i. *Cania bilinea* (Walker, 1855)

Neaera bilineata Walker, 1855, List Specimens lepid. Insects Colln Br. Mus. 5: 1142. Type locality: "China".

Aspidiotus bicarinatus Walker, 1858, List Homopt. Ins. Suppl.: 306.

Record: None.

Distribution: Bhutan (Dudgeon 1900), India, Malacca, Sumatra Java, Formosa (Inoue 1970), southern China, northern and central Vietnam (Solovyev & Witt 2009).

Remarks: Recorded in Bhutan by Dudgeon (1900) and could be misidentified as *Cania himalayana* Holloway, 1987. The species was not recorded during our study.

Genus *Ceratonema* Hampson, 1893

Ceratonema Hampson, 1893, Fauna Br. India Moths 1: 373 (key), 393.

Type species: *Limacodes retractata* Walker, 1865.

The genus includes medium-sized yellow moths. The forewings have 3 characteristic dark fasciae: 1 - from 1/3 dorsum to 1/2 costa, the second from tornus to 3/4 costa, and the third short, from 3/4 dorsum to centre of wing, parallel to outer margin. The male genitalia are slightly modified, with well-developed uncus and gnathos, valvae without saccular processes, but the aedeagus is tube-shaped, curved with characteristic apical zone of small denticles (Solovyev & Witt 2009).

i. *Ceratonema retractata* (Walker, 1865)

Limacodes retractata Walker, 1865, List Specimens lepid. Insects Colln Br. Mus. 32: 487. Type locality: "Darjeeling".

Record: None.

Distribution: Bhutan (Dudgeon 1900), northeastern India (Sikkim, Darjeeling) (Hampson 1892).

Remarks: Recorded for the first time for Bhutan by Dudgeon (1900). The species was not recorded during our study.

Genus *Euphlyctinides* Hering, 1931

Euphlyctinides Hering, 1931, in Seitz, Gross-Schmett. Erde 10: 704. Type species: *Euphlyctinides rava* Hering, 1931.

The male antennae is filiform. The ground colour is yellowish-brown. The forewings are elongate, covered with sparse dark scales, with two dark smooth fasciae. The genus is known from India, northern and western Thailand and northern Vietnam (Solovyev & Witt 2009).

i. *Euphlyctinides albifusum* (Hampson, 1892)

Ceratonema albifusum Hampson, 1892, Faun. Brit. Ind. Moths 1: 394. Type locality: "Nágas, 6000 feet".

Record: None.

Distribution: Bhutan (Dudgeon 1900), India, Nepal (Yoshimoto 1993; Solovyev 2009a)

Remarks: Recorded for the first time for Bhutan by Dudgeon (1900). The species was not recorded during our study.

Genus *Tetraphleba* Strand, 1920

Tetraphleba Strand, 1920, Int. ent. Z. 14: 174. Type species: *Miresa brevilinea* Walker, 1865.

= *Tetraphleps* Hampson, 1893, Fauna Br. India (Moths) 1: 372 (key), 383 [homonym of *Tetraphleps* Fieber, 1860, Wien. Ent. Monatschr. 4: 262 (Hemiptera)]. Type species: *Miresa brevilinea* Walker, 1865.

= *Tetraphlebs* Strand, 1920, Int. ent. Z. 14: 174 [incorrect subsequent spelling of *Tetraphleba*].

The genus is monotypical, known from the Indian region. The moths are medium-sized, with forewing length is about 12mm. The male antennae are broadly bipectinate, with very long rami. The head, thorax and forewings are uniform brown; the hindwings and the abdomen are ochre.

i. *Tetraphleba brevilinea* (Walker, 1865)

Miresa brevilinea Walker, 1865, List Specimens lepid. Insects Colln Br. Mus. 32: 475. Type locality: "Darjeeling".

Record: None.

Distribution: Bhutan (Dudgeon 1900), Nepal (Inoue 1970).

Remarks: Recorded for the first time for Bhutan by Dudgeon (1900). The species was not recorded during our study.

Genus *Trichogyia* Hampson, 1894

Trichogyia Hampson, 1894, Faun. Br. Ind. Moths 2: 103. Type species: *Trichogyia semifascia* Hampson, 1894.

The genus was erected by Hampson in 1894 based on the type species *Trichogyia semifascia* Hampson. The male of the genus has palpi upturned, the second joint reaching above vertex of head, and third short. The antennae are minutely ciliated and tibia hairy. Forewing short and broad and the apex nearly rectangular, inner margin much arched. Veins 2 and 3 from near angle of cell and much bent at base; 4 and 5 from the angle; 6 and 7 from close to upper angle; 8, 9, 10 stalked from the before the angle. Hindwing ample; veins 3 and 4 stalked; 5 from above angle of cell; 6 and 7 from cell (Hampson 1894).

i. *Trichogyia semifascia* Hampson, 1894

Trichogyia semifascia Hampson, 1894, Faun. Br. Ind. Moths 2: 103, Fig. 68. Type locality: "Tenasserim".

Ceratinema albidivisum Hampson, 1900, J. Bomb. Nat. Hist. Soc. 13: 232. Type locality: "Sikhim, 1,800'".

Record: None.

Distribution: Bhutan (Dudgeon 1900), India, Myanmar, Peninsular Malaysia, Sumatra, Java (Hampson 1894).

Remarks: Recorded in Bhutan by Dudgeon (1900). The species was not recorded during our study.

Genus *Atosia* Snellen, 1900

Atosia Snellen, 1900, Tijdschr. Ent. 43: 50 (key), 92. Type species: *Parasa doenia* Moore, 1859.

The genus is well distinguished externally by the hook-like pattern in forewing; its curvation contains a white mark. The apex of forewing is dark brown. The male genitalia are simple; the aedeagus with a terminal spine or a scobinate lobe. The larvae are of the smooth-type. The cocoon is spherical, dark brown (Holloway 1986). It ranges from India to Sundaland (Solovyev & Witt 2009).

i. *Atosia doenia* (Moore, 1859)

Parasa doenia Moore, 1859, Cat. Lep. Mus. E.I.C. 2: 416, t.11a, fig. 10. Type locality: "Java".

Record: None.

Distribution: Bhutan (Dudgeon 1900), southern Myanmar, Java, Sumatra, Borneo.

Remarks: Recorded in Bhutan by Dudgeon (1900) and probably misidentified (probable correct name is *Atosia himalayana* Holloway, 1986). The species was not recorded during our study.

Genus *Narosa* Walker, 1855

Narosa Walker, 1855, List Specimens lepid. Insects Colln Br. Mus. 5: 1103 (key), 1151. Type species: *Narosa conspersa* Walker, 1855.

The genus *Narosa* was erected by Walker based on type species *Narosa conspersa* Walker. It includes small-sized moths with forewing length 8–9 mm and wingspan 14–18 mm in male. The species are without strong sexual dimorphism; the females are just slightly larger than males (forewing length 9–10 mm and wingspan 19–20 mm). The forewings are yellowish with dark spots and fasciae. The presence of apical small streaks and narrow post-medial transverse fasciae is diagnostic. The outer margin of forewing bears dark spots ornamented by white colour between veins (Solovyev & Witt 2009).

i. *Narosa conspersa* Walker, 1855

Narosa conspersa Walker, 1855 List Specimens lepid. Insects Colln Br. Mus. 5: 1151, Type locality: "Ceylon".

Record: None.

Distribution: Bhutan (Dudgeon 1900), Sri Lanka (Walker 1855).

Remarks: Recorded in Bhutan by Dudgeon (1900). The species was not recorded during our study and probably mistakenly identified by Dudgeon (1900).

Genus *Ploneta* Snellen, 1900

Ploneta Snellen, 1900, Tijdschr. Ent. 43: 52 (key), 105. Type species: *Ploneta diducta* Snellen, 1900.

The genus includes medium-sized limacodids. The male antennae are broadly bipectinate up to the apex. The ground colour is brown, and the moths are almost uniformly coloured; the males are usually paler than the females, with well-developed submarginal fascia. The male genitalia are mostly diagnostic (Holloway 1986). The genus is sometimes considered as a subgenus within *Darna* Walker, 1862 sensu lato (Holloway 1986).

i. *Ploneta cotesi* (Swinhoe, 1893)

Thosea cotesi Swinhoe, 1893, Ann. Mag. Nat. Hist. (6)12: 211. Type locality: "Darang, Assam".

Record: None.

Distribution: Bhutan (Dudgeon 1900), northeastern India.

Remarks: Recorded in Bhutan by Dudgeon (1900). Not recorded during the present study.

CONCLUSION

The studies on Lepidoptera fauna in Bhutan are in the initial stages, thus data deficient. The present study provides a preliminary checklist on the family Limacodidae of Bhutan, which reports the presence of six genera and twelve species as new records for Bhutan. This family is also a very important pest and defoliators of many plant species. As an agricultural based country, it becomes a necessity to understand the ecology and pest status of this family of moths in Bhutan. The lack of available literature on Lepidoptera fauna particularly of Bhutan creates a gap in understanding the diversity, ecology and their importance in Bhutan. Research initiatives and funding from public and private initiatives on Lepidoptera studies is advisable to encourage the study on this magnificent group of insects.

REFERENCES

- Cotes, E.C. & C. Swinhoe (1887). *A Catalogue of the Moths of India*. The Trustees of the Indian Museum, 842pp.
- Chettri, D.B. (2014). *Check List of Insect Documented from Bhutan*. Bhutan Biodiversity Portal website. Accessed on 20 November 2014.
- Dierl, W. (1975). Ergebnisse der Bhutan-Expedition 1972 des Naturhistorischen Museums in Basel, Einige Familien der "bombycomorphen" Lepidoptera. *Entomologica Basiliensia* 1: 119–134.
- Dudgeon, G.C. (1900). A catalogue of the Heterocera of Sikkim and Bhutan. With notes by H.J. Elwes and additions by Sir. George F. Hampson. Part VIII. *Journal of the Bombay Natural History Society* 13: 258–269.
- Epstein, M.E., H. Geertsema, C.M. Naumann & G.M. Tarmann (1999). *The Zygaenoidea*, pp. 159–180. In: Kristensen, N.P. (ed.). *Lepidoptera: Moths and Butterflies 1. Evolution, Systematics, and Biogeography. Handbook of Zoology* 4, Part 35. De Gruyter, Berlin and New York, 491pp.
- Godfray, H.C.J., M.J.W. Cock & J.D. Holloway (1987). Chapter 1. An introduction to the Limacodidae and their bionomics, pp. 1–8. In: Cock, M.J.W., J.C.J. Godfray & J.D. Holloway (eds). *Slug and Nettle Caterpillars*. CAB International, Wallingford, England, UK, 270pp+36pls.
- Hampson, G.F. (1892). *Fauna of British India including Ceylon and Myanmar - Moths Vol. I*. Taylor and Francis, London, xiii+527pp.
- Hampson, G.F. (1895). *Fauna of British India including Ceylon and Myanmar - Moths Vol. IV*. Taylor and Francis, London, xxiii+588pp.
- Holloway, J.D. (1986). The Moths of Borneo: Key to Families; Families Cossidae, Metarbelidae, Rataedidae, Dudgeoneidae, Epipyropidae and Limacodidae. *Malayan Nature Journal* 40(1–2): 1–165.
- Holloway, J.D., M.J.W. Cock & R. Desmier de Chenon (1987). Chapter 3. Systematic account of South-east Asian pest Limacodidae, pp. 15–117. In: Cock, M.J.W., H.C.J. Godfray & J.D. Holloway. *Slug and Nettle Caterpillars*. CAB International, Wallingford, England, UK.
- Inoue, H. (1970). Limacodidae of eastern Nepal based on the collection of the Lepidopterological research expedition to Nepal Himalaya by the Lepidopterological Society of Japan in 1963. *Special Bulletin on Lepidopterological Society of Japan* 4: 189–201.
- Inoue, H. (1992). 80. *Limacodidae*, pp. 101–102. In: Heppner, J.B. & H. Inoue (eds.). *Lepidoptera of Taiwan 1 - Part 2: Checklist*. Scientific Publishers, Gainesville.
- Irungbam, J.S., M.S. Chib & K. Wangdi (2016). Taxonomic review of the superfamily Pyraloidea in Bhutan (Lepidoptera). *Journal of Asia-Pacific Biodiversity* 9(3): 355–382.
- Kendrick, R.C. (2002). Moths (Insecta: Lepidoptera) of Hong Kong. PhD Thesis, University of Hong Kong, 660pp+47pls.
- Light, S.S. (1927). Report of the Entomologist for 1926. Tea Research Institute of Ceylon, Talawakele 1: 16–20.
- Nakao, K. (2014). *Digital moths of Asia*. Online version last updated on August 21, 2014. Accessed on November 20, 2014. http://www.jpmoth.org/~dmoth/Digital_Moths_of_Asia/60_ZYGAENOIDEA/Limacodidae/framepage%20Limacodidae.html
- Nieukerken, E.J. van, L.Kaila, I.J. Kitching, N.P. Kristensen, D.C. Lees, J. Minet, C. Mitter, M. Mutanen, J.C. Regier, T.J. Simonsen, N. Wahlberg, S.H. Yen, R. Zahir, D. Adamski, J. Baixeras, D. Bartsch, B.A. Bengtsson, J.W. Brown, S.R. Bucheli, D.R. Davis, J.D. Prins, W.D. Prins, M.E. Epstein, P.G. Poole, C. Gielis, P. Hattenschwiler, A. Hausmann, J.D. Holloway, A. Kallies, O. Karsholt, A.Y. Kawahara, S. Koster, M.V. Kozlov, J.D. Lafontaine, G. Lamas, J.F. Landry, S. Lee, M. Nuss, K.T. Park, C. Penz, J. Rota, A. Schintmeister, B.C. Schmidt, J.C. Sohn, M.A. Solis, G.M. Tarmann, A.D. Warren, S. Weller, R.V. Yakovlev, V.V. Zolotuhin & A. Zwick (2011). Order Lepidoptera Linnaeus, 1758. In: Zang, Z.Q. (ed.) 2011: Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness. *Zootaxa* 3148: 212–221.
- Pan, Z., C. Zhu & C. Wu (2013). A review of the genus *Monema* Walker in China (Lepidoptera, Limacodidae). *ZooKeys* 306: 23–36; <http://doi.org/10.3897/zookeys.306.5216>
- Piepers, M.C. & P.C.T. Snellen (1900). Enumeration des Lepidoptères Heterocères recueillis à Java. *Tijdschrift voor Entomologie* 43: 12–106.
- Solovyev, A.V. (2008). Review of the genus *Phocoderma* Butler, 1886 (Zygaenoidea: Limacodidae). *Nota Lepidopterologica* 31(1): 53–63.
- Solovyev, A.V. (2009a). Notes on South-East Asian Limacodidae (Lepidoptera, Zygaenoidea) with one new genus and eleven new species. *Tijdschrift voor Entomologie* 152: 167–183, Figs. 1–54.
- Solovyev, A.V. (2009b). A taxonomic review of the genus *Phixolepia* (Lepidoptera, Limacodidae). *Entomological Review* 89(6): 730–744.
- Solovyev, A.V. (2010). A review of the genus *Aphendala* Walker, 1865 with notes on confusing genera (Lepidoptera, Limacodidae). *Atalanta, Würzburg* 41(3/4): 349–360.
- Solovyev A.V. (2014). *Parasa* Moore auct. Phylogenetic review

- of the complex from the Palaearctic and Indomalayan regions (Lepidoptera, Limacodidae). *Proceedings of the Museum Witt 1*. Munich-Vilnius, 240pp.
- Solovyev, A.V. & T.J. Witt (2009)**. The Limacodidae of Vietnam. *Entomofauna, Supplement 16*: 33–321 + 20 colour plates.
- Solovyev, A.V., H.Th. Ta & T.D. Tran (2009)**. *Pest status of the Limacodidae (Lepidoptera: Zygaenoidea) of Vietnam*. Proceedings of the 3rd National Scientific Conference on Ecology and Biological Resources, Hanoi. 12–20pp.
- Solovyev, A.V. & A. Saldaitis (2013)**. A new species of *Caissa* Hering, 1931 (Lepidoptera, Limacodidae) from China. *Zootaxa* 3693(1): 097–100; <http://doi.org/10.11646/zootaxa.3693.1.8>
- Wei Z. & C.S. Wu (2008)**. China flat postornata, *Thosea* genera (Lepidoptera, Limacodidae). *Acta Zootaxonomica Sinica* 33(2): 385–390. (Original in Chinese with English abstract).
- Wu, C.S. & C. Fang (2008a)**. A review of the genus *Aphendala* Walker in China (Lepidoptera, Limacodidae). *Acta Zootaxonomica Sinica* 33(4): 691–695.
- Wu, C.S. & C. Fang (2008b)**. A review of the genera *Phlossa* Walker and *Iragoides* Hering in China (Lepidoptera, Limacodidae). *Acta Zootaxonomica Sinica* 51(7): 753–760.
- Wu, C.S. & C. Fang (2009a)**. A review of the genus *Squamosa* Bethune-Baker in China (Lepidoptera, Limacodidae). *Acta Zootaxonomica Sinica* 34(2): 237–240.
- Wu, C.S. & C. Fang (2009b)**. A review of the genus *Narosa* Walker in China (Lepidoptera: Limacodidae). *Acta Entomologica Sinica* 52(5): 561–566.
- Wu, C.S. & C. Fang (2009c)**. A review of the genus *Scopelodes* Westwood in China (Lepidoptera, Limacodidae). *Acta Zootaxonomica Sinica* 52(6): 684–690.
- Wu, C.S. & A.V. Solovyev (2011)**. A review of the genus *Miresa* Walker in China (Lepidoptera: Limacodidae). *Journal of Insect Science* 11: 34; <http://doi.org/10.1673/031.011.0134>
- Yoshimoto, H. (1993)**. Limacodidae, pp. 31–35. In: Haruta, T. (eds.). *Moths of Nepal, Part 2. Tinea, 13 (Supplement 3)*. The Japan Heterocerists' Society.
- Yoshimoto, H. (1994)**. Limacodidae, pp. 85–89. In: Haruta, T. (eds.). *Moths of Nepal, Part 3. Tinea Vol. 14 (Supplement 1)*. The Japan Heterocerists' Society.



**OPEN ACCESS**

The Journal of Threatened Taxa is dedicated to building evidence for conservation globally by publishing peer-reviewed articles online every month at a reasonably rapid rate at www.threatenedtaxa.org. All articles published in JoTT are registered under [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/) unless otherwise mentioned. JoTT allows unrestricted use of articles in any medium, reproduction, and distribution by providing adequate credit to the authors and the source of publication.

ISSN 0974-7907 (Online); ISSN 0974-7893 (Print)

February 2017 | Vol. 9 | No. 2 | Pages: 9777–9884

Date of Publication: 26 February 2017 (Online & Print)

DOI: 10.11609/jott.2017.9.2.9777-9884

www.threatenedtaxa.org

Article**Flora richness as an indicator of desert habitat quality in Kuwait**

-- Yahya Al-Shehabi & Kevin Murphy, Pp. 9777–9785

Communications**Distribution of *Cryptopotamon anacoluthon* (Kemp, 1918) (Crustacea: Brachyura: Potamidae), a freshwater crab endemic to Hong Kong**

-- David John Stanton, Michael Robertson Leven & Tommy Chung Hong Hui, Pp. 9786–9794

Moths of the family Limacodidae Duponchel, 1845 (Lepidoptera: Zygaenoidea) from Bhutan with six new generic and 12 new species records

-- Jatishwor Singh Irungbam, Meenakshi Singh Chib & Alexey V. Solovyev, Pp. 9795–9813

Odonates of Coimbatore District, Tamil Nadu, India

-- M. Suhirtha Muhil & P. Pramod, Pp. 9814–9828

Twenty-three new records of mantodea (Insecta) from some states of India

-- Tushar Kanti Mukherjee, Geetha Iyer & Parbati Chatterjee, Pp. 9829–9839

Short Communications**On the feeding habit of the Guiana Dolphin *Sotalia guianensis* (van Benedèn, 1864) (Mammalia: Cetartiodactyla: Delphinidae) in southeastern Brazil (~220S): has there been any change in more than two decades?**

-- Ana Paula Madeira Di Benedetto, Clara da Cruz Vidart Badia & Salvatore Siciliano, Pp. 9840–9843

Additions to the scorpion fauna (Arachnida: Scorpiones) of Kerala, India, with an illustrated key to the genera

-- K. Aswathi & P.M. Sureshan, Pp. 9844–9850

Diversity of two families Libellulidae and Coenagrionidae (Odonata) in Regional Institute of Education Campus, Bhubaneswar, Odisha, India

-- Priyamvada Pandey & Animesh Kumar Mohapatra, Pp. 9851–9857

A report on occurrence of aphidophagous predators of *Aphis odinae* (van der Goot) (Hemiptera: Aphididae) in cashew ecosystem from Goa, India

-- Ramasamy Maruthadurai & Narendra Pratap Singh, Pp. 9858–9861

Notes**A new critical habitat for conservation of the White-bellied Heron *Ardea insignis* Hume, 1878 (Aves: Ardeidae) from Bhutan**

-- Karma Wangdi, Tashi Dhendup & Tsethup Tshering, Pp. 9862–9863

First report of the parasitoid wasp *Piestopleura Förster* (Hymenoptera: Platygastroidea: Platygasteridae) from India

-- Kamalanathan Veenakumari, Peter Neerup Buhl, Anandhan Rameshkumar & Prashanth Mohanraj, Pp. 9864–9865

A century later the Manipur Argus *Callerebia suroia* Tytler, 1914 (Lepidoptera: Nymphalidae: Satyrinae) recorded in its type locality in Manipur, India

-- Jatishwor Singh Irungbam, Harmenn Huidrom & Baleshwar Singh Soibam, Pp. 9866–9869

First record of the predatory stinkbug *Eocanthecona concinna* (Walker, 1867) (Pentatomidae: Asopinae) from India

-- Sadashiv Hanumant Waghmare & Sunil Madhukar Gaikwad, Pp. 9870–9873

New records of Aplousobranch ascidians to Indian waters from Andaman Islands

-- Jhimli Mondal, C. Raghunathan & K. Venkataraman, Pp. 9874–9880

Additions to the flora of Coimbatore hills, Tamil Nadu, India

-- K. Kiruthika, M. Sulaiman & R. Gopalan, Pp. 9881–9884