The Lasiocampidae of Bhutan
(Lepidoptera, Lasiocampidae)
by
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Abstract: 42 species of the Lasiocampidae collected after field trips by HAUSENSTEIN and SINJAEV are listed from Bhutan; 27 of them noted for the first time from Bhutan. Two species and one subspecies are described as new: Kunugia dzong spec. nov., Kosala kado spec. nov. and Amurilla subpurpurea dharma subspec. nov.

Zusammenfassung: 42 Lasiocampidae-Arten aus den Expeditionen von HAUSENSTEIN und SINJAEV werden für Bhutan nachgewiesen, davon 27 Arten erstmalig. Zwei für die Wissenschaft unbekannte Arten und eine Unterart werden beschrieben und abgebildet: Kunugia dzong spec. nov., Kosala kado spec. nov. und Amurilla subpurpurea dharma subspec. nov.

The Kingdom of Bhutan is a landlocked country in South Asia, located at the eastern end of the Himalaya Mountains and bordered to the south, east and west by India and to the north by China. Bhutan was separated from the nearby state of Nepal to the west by the Indian state of Sikkim, and from Bangladesh to the south by West Bengal. The Bhutanese called their country Druk Yul which means „Land of the Thunder Dragon“.

Bhutan is still one of the most isolated countries in the world. Developments including direct international flights, the Internet, mobile phone networks, and cable television have increasingly modernized the urban areas of the country. Bhutan balanced modernization with its ancient culture and traditions under the guiding philosophy of Gross National Happiness. Rampant destruction of the environment has been avoided. The government takes great measures to preserve the nation’s traditional culture, identity and environment.

The state religion is Vajrayana Buddhism, introduced to Bhutan in the 7th century AD, and the population of ca. 690000 is predominantly Buddhist, with Hinduism being the second-largest religion. The capital and largest city is Thimphu. After centuries of direct monarchic rule, Bhutan held its first democratic elections in March 2008. On November 6th 2008, 28-year old JIGME KHASI RAMGEL YANGCHUCK, eldest son of King JIGME SINGYE WANGCHUCK, was crowned King, thus marking a new era in the history of this Himalayan kingdom with constitutional monarchy.

The total area of the country is currently 38394 km². Bhutan’s landscape ranges from subtropical plains in the south to the Himalayan heights in the north. The northern region of the country consists of an arc of Eastern Himalayan alpine shrub and meadows reaching up to glaciated mountain peaks with an extremely cold climate at the highest elevations. Most peaks in the north are over 7000 m above sea level; the highest point is claimed to be the Kula Kangri, at 7553 m, but detailed topographic studies claim Kula Kangri is wholly in Tibet and modern Chinese measurements claim Gangkhar Puensum, which has the distinction of being the highest unclimbed mountain in the world, is higher at 7570 m. The lowest point is in the valley of Drangme Chhu, where the river crosses the border with India. Watered by snow-fed rivers, alpine valleys in this region provide pasture for livestock, tended by a sparse population of migratory shepherds.

The Black Mountains in the central region of Bhutan form a watershed between two major river systems: the Mo Chhu and the Drangme Chhu. Peaks in the Black Mountains range between 1500 and 2700 m above sea level, and fast-flowing rivers have carved out deep gorges in the lower mountain areas. The forests of the central Bhutan mountains consist of Eastern Himalayan subalpine conifer forests at higher elevations and Eastern Himalayan broadleaf forests at lower levels. Woodlands of the central region provide most of Bhutan’s forest production. The Torsa, Raikad, Sankosh, and Manas are the main rivers of Bhutan, flowing through this region. Most of the population lives in the central highlands.

In the south, the Shivalik Hills are covered with dense Himalayan subtropical broadleaf forests, alluvial lowland river valleys, and mountains up to around 1500 m above sea level. The foothills descend into the subtropical Duars Plain. Mountain rivers, fed by either the melting snow or the monsoon rains, empty into the Brahmaputra River in India. Data released by the Ministry of Agriculture showed that the country had a forest cover of 64% as of October 2005.

The climate in Bhutan varies with altitude, from subtropical in the south to temperate in the highlands and polar-type climate, with year-round snow, in the north. Bhutan experiences five distinct seasons: summer, monsoon, autumn, winter and spring. Western Bhutan has the heavier monsoon rains; southern Bhutan has hot humid summers and cool winters; central and eastern Bhutan is temperate and drier than the west with warm summers and cool winters.

Bhutan has a rich and varied biological diversity. Very few countries in the world match Bhutan’s biological diversity and fewer still have taken such strong steps to conserve their biodiversity. Bhutan, for example, has its own Biodiversity Action Plan. The country ranks amongst the top ten percent of highest species density (species richness per unit area) in the world, and it has the largest proportion of land under protected areas. Some 26.23% of the country’s area is protected through National Parks. In addition, a further 9% has been declared as Biological Corridors, connecting protected areas, and there are a series of Conservation Areas intended to protect important conservation sites outside the formal Protected Areas system. As a result, more than 35% of the country’s area is under the protection of some form of conservation management. This system serves as a globally unique system for in situ conservation of biodiversity.

Regarding diversity at the species level, inventories have indicated that there are more than 5500 vascular plant species, more than 770 species of bird and more than 165 species of mammal, with many species being endemic to Bhutan. Forest type in Bhutan is diverse. Over 60 percent of the common plant species of the Eastern Himalayas are found in Bhutan. The forest type consists of mixed conifer forest, fir forest, chir pine forest, blue pine forest, broadleaf mixed with conifers, tropical lowland forests, lowland hardwood forest and upland hardwood forest.

The lasiocampid fauna of Bhutan is very poorly studied so far. The only work especially devoted is that by DUDGEON (1901). Other citations (FLETCHER, 1925) are mainly only secondary records to the data of DUDGEON with the exception of a work by DIERL (1975) with 5 species of Lasiocampidae.
This article is based on rich material obtained by HAUENSTEIN in Bhutan in 2003-2007 and by INJAEV in 2008-2009. The scientific expeditions by HAUENSTEIN became possible because of his good contacts with the Prince KADO responsible for tourism in Bhutan, as well with the Honorary Consul of Southern Germany Dr. WOLFGANG PFEIFFER. Also, due to the initiative of ARMIN HAUENSTEIN, some of the costs were transferred for the humanitarian help of the country.

Itinerary of the expeditions of ARMIN HAUENSTEIN:

- 24.VI. - 6.VII.2003, A. HAENSTEIN & P. KAUTT;

As a result, 42 species of the Lasiocampidae belonging to 27 genera are listed here from the territory of the country.

Material from the following museums and private collections was investigated and the following abbreviations are used in the text:

- CAHU: private collection of ARMIN HAENSTEIN, Untermünkheim, Germany;
- CSIF: private collection of SIGGFRED IHLE, Filderstadt, Germany;
- CVSM: private collection of VIKTOR SINJAEV, Moscow, Russia;
- ZISP: Zoological Museum of Russian Academy of Sciences, Sankt Peterburg, Russia;
- ZHUB: Zoological Museum of Humboldt Universität zu Berlin, Germany.

Material for the following species and private collections was investigated and the following abbreviations are used in the text:

- CYBM: private collection of ANDREAS ZOBODAT, Munich, Germany;
- CVSM: private collection of WOLFGANG POLKOFER, Bonn, Germany;
- ZFMS: Zoologisches Forschungsinstitut und Museum ALEXANDER KOEGN, Bonn, Germany;
- ZISP: Zoological Museum of Russian Academy of Sciences, Sankt Peterburg, Russia;
- ZMHU: Zoologisches Museum der Humbold Universität zu Berlin, Germany.

**Annotated checklist of the species**

*Amarilla subpurpurea* (Butler, 1881)

Poecilocampa subpurpurea BUTLER, 1881, Trans. Ent. Soc. London 1881: 18. Type locality: Japan, Tokyo. Type:♀ (BMNH) [examined].

**Amarilla subpurpurea drang drang subsp. nov.** (col. pl. 1: 3)

Holotype ♀, Bhutan (Central), 9 km E Wangdue, Phodrang Kichu Resort, 1300 m, 7.VIII.2005, leg. A. HAENSTEIN & P. KAUTT (CAHU).

Paratypes: 8♂♂, 2♀♀ Bhutan (Central), 9 km E Wangdue, Phodrang Kichu Resort, 1300 m, 7.VIII.2005, leg. A. HAENSTEIN & P. KAUTT (CAHU);

1♂, Bhutan (Central), Trongs Dzongkhag, road Trongs-Yotong La, 5 km NE Trongs, 27°31'19"N, 90°32'57"E, 3040 m, 19.VI.2007, leg. P. KAUTT & S. NAUMANN (CAHU);

2♂♂, Bhutan (Central), 9 km E Wangdue, Phodrang Kichu Resort, 1300 m, 7.VIII.2005, leg. A. HAENSTEIN & P. KAUTT (CSIF);

3♂♂, Bhutan, Dung Dung, Nobding, 27°32'N, 90°11'E, 1970 m, 1.-3.VII.2009, leg. V. SINJAEV (CVSM);

5♂♂, 1♀♀, Bhutan, Pel La Pass, 27°33'N, 90°12'E, 29.-30.VI.2009, 3279 m, leg. V. SINJAEV (CVSM).

**Diagnosis:** Forewing length is 31-35 mm in ♀♂ and 41 mm in a single ♀. A most colourful subspecies and in its contrasting forewing pattern much resembles *Ar. rubra* (HAMSPON, 1896), but with wings shorter and broader. Dark weakly semitransparent hind wings with dark pinkish with violet grey outer margin is typical for the subspecies; markings on the forewings are dark citron yellow. Abdomen pale citron-yellow with dorsal greyish band and weakly observed grey rings on each segment not typical for other subspecies ♀♂ genitalia as figured (fig. 4), vesica with a ring of sparse and short needle-shaped cornuti; sternum VIII with lateral angles protruded and deep triangular medio-caudal cut.

**Distribution:** Bhutan; the same subspecies is also known from eastern Nepal.

**Taxonomic remarks:** The southernmost subspecies of this polymorphic species. Others are restricted mostly to the northern parts of the range: **ssp. subpurpurea** BUTLER, 1881, to Japan, Sakhalin, Far East of Russia, Korea and NE China,ssp. flavopurpurea BANG-HAAS, 1927 with contrasting light pattern - to Transbaikalia in Russian Siberia and to northern Mongolia, paler ssp. *kansensis* O. BANG-HAAS, 1939 to Central China (Prov. Gunsu and Shanxi) and large, dark, contrasty patterned ssp. obscurior ZOLOTUHN & WITT, 2000 - to Northern Vietnam, Thailand and Southern China (Yunnan, Sichuan).

Ectomy: „Dharma“ (Sanskrit: dhārma) is an Indian spiritual and religious term that means ‘one’s righteous duty’, or ‘any virtuous path’. In modern languages, depending on the context, it can be equivalent simply to ‘religion’. The word “dharma” translates as “that which upholds or supports”, and is generally translated into English as ‘law’. Dharma also refers to the teachings and doctrines of the founders of Buddhism and Jainism, the Buddha and Mahavira. In Buddhist philosophy, dharma is also the term for „phenomenon“.

**Baodera khasiana** (Moore, 1879)

*Trichiura khasiana* MOORE, 1879, in HAWTIN & MOORE, Descr. new Indian liped. Insects coll later Mr. W. S. ATKINSON 1: 82, pl. 3: 21. Type locality: [Northern India] Khasia Hills. Holotype ♀ (ZHUB) [examined].

Material: 5♂♂, Bhutan (West), Jomolhari Trek, 3 km N Shana Zampa, 3080 m, 4.VIII.2005, leg. A. HAENSTEIN & P. KAUTT (CAHU, CSIF); 2♂♂, Bhutan, Bumthang, 27°31'N, 90°32'33"E, H-2420 m, 7.-9.VII.2009, V. SINJAEV (CVSM); 2♂♂, Bhutan, Dung Dung, Nobding, 27°32'N, 90°11'E, 1970 m, 1.-3.VII.2009, leg. V. SINJAEV (CVSM).

**Distribution:** Northern India, Nepal, Bhutan, southern China (Yunnan, Zhenyuan), Myanmar.

**Trabula visnou** (LEFEBVRE, 1827)

*Gastrophaca visnou* LEFEBVRE, 1827, Zool. J. 3: 207. Type locality: Northern India. Types: not found.

References: DIERL (1975).

Material: 2♂♂, central Bhutan. Distr. Wangdue-Phodrang, 7 km E Wangdue-Dzong, Dang-Chu valley, 1300 m, 1.-2.VII.2003, leg. A. HAENSTEIN & P. KAUTT (CAHU); 1♂, Bhutan (East), Mongar Dzongkhag, forest road 6 km SW Limitzhang, 27°13'12"N, 91°07'39"E, 1600 m, 15.VI.2007, leg. P. KAUTT & S. NAUMANN (CAHU); 2♂♂, 2♀♀, Bhutan central, Wangdue Phodrang Dzongkhag, Chhuomsa, Kichu Resort, 27°30'22"N, 89°57'36"E, 1360 m, 12.VI.2007, leg. P. KAUTT & S. NAUMANN (CSIF); 3♀♀, Bhutan, Morong, Sambrup-Jongkhar, 26°56'N, 91°33'E, H-2273 m, 3.-4.V.2009, leg. V. SINJAEV (CVSM).

**Distribution:** North-Eastern Pakistan, India, Ceylon, China, Taiwan, Nepal, Bhutan, Thailand, Laos, Vietnam and Malaysia.

DIERL listed the species from Punakha, 1560 m.
**Crinocapsa torrida** (Moore, 1879)

Gastropacha torrida Moore, 1879, in Hewitson & Moore, Descr. new Indian lepid. Insects colln late Mr. W. S. Atkinson 1: 76, pl. 3, fig. 19. Type locality: India, Darjeeling. Holotype ♀ (ZHUB) [examined].

References: Dudgeon (1901: 409); Fletcher (1925: 18).

Material: No fresh material at our disposal.

Distribution: Northern and Central India, Southern China, Bhutan, Northern Thailand, Laos, Northern Vietnam.

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**Euthrix vulpes** Zolotuhin, 2001

Atalanta 32 (3/4): 454, fig. 1, col. pl. 22: 1, 2. Type locality: Sikkim, Mt. Kanchenjunga SE, 27°30′N, 82°20′E, 2225 m. Holotype ♀ (MMW) [examined].

Material: 1 ♀, Bhutan (West), Thimpu Dzongkha, 1.5 km NE Dochu La, 27°29′45″N, 89°45′48″E, 2820 m, 10.VI.2007, leg. P. Kautt & S. Naumann (CSIF); 1 ♀, Bhutan (Central), Trongsa Dzongkha, Chuzomtsa, Kichu Resort, 27°30′22″N, 89°57′36″E, 1360 m, 12.VI.2007, leg. P. Kautt & S. Naumann (CAHU); 1 ♀, Bhutan, Punakha, Shatem Camp, 27°43′N, 89°45′E, H=1500 m, 28.-29.VI.2009, V. Siniaev (CVSM).

Distribution. Northern India, Nepal, Bhutan.

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**Euthrix inobtrusa** (Walker, 1862)


Distribution: Northern India, Nepal, Bhutan, central and southern China (Hunan, Jiangxi, Fujian, Guangdong, Guangxi, Yunnan, Guizhou, Hainan), Thailand, Vietnam, Peninsular Malaysia, Sumatra.

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**Euthrix isocyma** (Hampson, 1892)

Odonestis isocyma Hampson, 1892, Fauna Br. India incl. Ceylon and Burma, Moths I: 427. Type locality: Assam, Nagla Hills. Holotype ♀ (BMNH) [examined].


Distribution: From northern India, Nepal and Bhutan to south-eastern China (Yunnan, Simao, Sichuan, Guizhou, Xizang)."
Radhica flavovittata Moore, 1879
In HEWITSON & MOORE, Descri. new Indian lepid. Insects colln late Mr. W. S. ATKINSON I: 79. Type locality: India, Nainital. Lectotype $\sigma$ (ZMHU) [examined].
References: HAMPTON (1892: 412, as *Argoidea flavovittata*) Moore; FLETCHER (1925: 12, as *Argoidea flavovittata*) Moore.
Material: 1 $\sigma$, Bhutan, IX.1885, MOLLER (BMNH); 4 $\varphi\delta$, Bhutan (East), Mongar Dzongkhag, forest road 6 km SW Limithang, 27°13'12"N, 91°07'39"E, 1600 m, 15.VI.2007, leg. P. KAUT & S. NAUMAN (CAHU, CSIF).
Distribution: Northern India, Nepal, Southern China, Taiwan, Bhutan, Myanmar, Northern Thailand, Laos, Vietnam, Sumatra, Borneo, Peninsular Malaysia.

Radhica puana ZOLOTUHIN, 1995
Radhica flavovittata puana ZOLOTUHIN, 1995, Tinea 14 (3): 168, Figs 12, 24a, 24b. Type locality: Northern Thailand, Nan Prov., Pua, Doi Phu Kha, km 35, 1680 m. Holotype $\sigma$ (ZFMK) [examined].
Material: 1 $\varphi$, Bhutan, 4 km W Singor, 27°21'N, 91°02'E, 2420 m, 25.X.2009, leg. YU. BEZVERKHOV & V. SINIAEV (CYBM).
Distribution: Bhutan, Northern Thailand, Laos, Vietnam.

Zolotuhinia bhutata (ZOLOTUHIN, 2000)
*Gorgonella* bhutata ZOLOTUHIN, 2000, Entomofauna Suppl. 11 (3): 46, figs 7, 8, pl. 3: 17. Type locality: Bhutan. Holotype $\sigma$ (ZFMK) [examined].
Material: Holotype $\sigma$, Bhutan (ZFMK).
Distribution: Is known only from Bhutan so far; probably mislabelled and should be restricted to Madagascar.

Estigena pardale (WALKER, 1855)
*Megasoma* pardale WALKER, 1855, List. Spec. lepid. Insects Colln Brit. Mus. 6: 1453. Type locality: India, Darjeeling. Holotype $\sigma$ (BMNH) [examined].
References: DUDGEON (1901: 410, as *Estigena pardalis*) WALKER; FLETCHER (1925: 21, as *Estigena pardalis* WALKER.).
Material: 1 $\varphi$, Bhutan, Mo Chu river, 27°43'N, 89°45'E, 1500 m, 20.VI.2007, leg. P. WALKER, 1 $\varphi$, Bhutan, Mo Chu-valley, 16 km NW Punakha, 27°41'54"N, 89°46'08"E, 1500 m, 11.VI.2007, leg. P. KAUT & S. NAUMAN (CAHU).
Distribution: India, Nepal, Bhutan, Southern China (Fujian), Thailand, Laos, Vietnam, Myanmar, Borneo, Sumatra, Andaman Isl., the Philippines.

Gastropacha moorei (WALKER, 1855)
*Gastropacha* moorei WALKER, 1855, List Lepid. Het. Colin Br. Mus. 6: 1412. Type locality: Bangladesh, Sylhet. Syntype $\sigma$ (BMNH) [examined].
References: DUDGEON (1879, loc. cit.) pointed out caterpillars from Artemisia.
Material: 1 $\varphi$, Bhutan (West), Thimpu Dzongkhag, Mo Chu-valley, 16 km NW Punakha, 27°41'54"N, 89°46'08"E, 1500 m, 11.VI.2007, leg. P. WALKER, 1 $\varphi$, Bhutan (East), Mongar Dzongkhag, forest road 6 km SW Limithang, 27°13'12"N, 91°07'39"E, 1600 m, 15.VI.2007, leg. P. KAUT & S. NAUMAN (CAHU); 1 $\varphi$, Bhutan (Central), Trongsa Dzongkhag, road Trongsa-Yotong La, 5 km NE Trongs, 27°31'19"N, 90°32'57"E, 3040 m, 19.VI.2007, leg. P. KAUT & S. NAUMAN (CAHU); 1 $\varphi$, Bhutan (East), Mongar Dzongkhag, forest road 6 km SW Limithang, 27°13'12"N, 91°07'39"E, 1600 m, 15.VI.2007, leg. P. KAUT & S. NAUMAN (CAHU); 1 $\varphi$, Bhutan (East), Mongar Dzongkhag, 5,5 km NW Limithang, Yonkola 27°18'31"N, 9°09'48"E, 1600, 18.VI.2007, leg. P. KAUT & S. NAUMAN (CSIF); 1 $\varphi$, Bhutan (Central), Wangue Phodrang Dzongkhag, Chuzomsa - Teshianeng. 9 km NE Chuzomsa, 27°31'19"N, 90°32'57"E, 2000 m, 20.VII.2007, leg. P. KAUT & S. NAUMAN (CSIF).

Lebeda fulgens MOORE, 1879
*Lebeda* fulgens MOORE, 1879, in HEWITSON & MOORE, Descri. new Indian lepid. Insects colln late Mr. W. S. ATKINSON I: 81. Type locality: Darjiling. Holotype $\sigma$ (BMNH) [examined].
References: DUDGEON (1901: 407, as *Metanastria fulgens*) MOORE; FLETCHER (1925: 6, as *Metanastria ampla*) WALKER; DIERL (1975, as *Metanastria ampla* WALKER.).
Material: No fresh material at our disposal.
Distribution: India, Bangladesh, Southern China, Thailand, Laos, Vietnam, Peninsular Malaysia. DIERL listed the species from Wangdi Phodrang, 1300 m. DUDGEON (loc. cit.) pointed out caterpillars to Artemisia.

Kunugia fulgens (MOORE, 1879)
*Kunugia* fulgens Meteor, 1879, in HEWITSON & MOORE, Descri. new Indian lepid. Insects colln late Mr. W. S. ATKINSON I: 81. Type locality: Darjiling. Holotype $\sigma$ (BMNH) [examined].
References: DUDGEON (1901: 407, as *Metanastria fulgens*) MOORE; FLETCHER (1925: 6, as *Metanastria fulgens*) MOORE.
Material: 1 $\varphi$, Bhutan, 5 km S Tongsa Dzong, 27°27'8"N, 90°30'1"E, 1925 m, 30.IV.2009, leg. V. SINIAEV (CVSM).
Distribution: Northern India, Nepal, southern China, Thailand, Vietnam. DUDGEON (loc. cit.) pointed out the species from the higher altitudes of about 6,400 ft.
Kunugia placida (MOORE, 1879)

Lebeda placida MOORE, 1879, in HEWITSON & MOORE, Descr. new Indian lepid. Insects colln late Mr. W. S. ATKINSON I: 80. Type locality: Northern India, Darjeeling. Holotype ♂ (BMNH) [examined].

Lebeda Lidderdalii BUTLER, 1881, III. Heteroc. Ins. Coll. Brit. Mus. 5: 73, pl. 100, 1, 2. Type locality: Bhutan. Lectotype ♂ (BMNH) [examined].

References: BUTLER (1881: 73, as Lebeda lidderdalii BUTL.); HAMPSH (1892: 410, as Metanastria lidderdalii BUTL.); DUDGEON (1901: 407, as Metanastria lidderdalii BUTL.); GRÜNB (1923: 395, pl. 34, row d, as Metanastria lidderdalii BUTL.); FLETCHER (1925: 8, as Dendrolimus lidderdalii BUTL.).

Material: 1 ♂, 1 ♀, syntypes of lidderdalii BUTL., Bhutan (BMNH).

Distribution: India, southern China, Bhutan, Thailand, Vietnam, Peninsular Malaysia.

Kunugia linea (MOORE, 1879)

Lebeda linea MOORE, 1879, in HEWITSON & MOORE, Descr. new Indian lepid. Insects colln late Mr. W. S. ATKINSON I: 81. Type locality: India, Darjiling. Lectotype ♂ (ZMZH) [examined].

Material: 1 ♂, West Bhutan, Distr. Paro, 5 km N Paro, Do khu valley, 2350 m, 24.VI.-6.VII.2003, leg. A. HAUENSTEIN & P. KAUTT (CAHU); 7 ♂♂, 1 ♀, Bhutan (West), Thimphu dzongkhag, 1.5 km NE Dochu La, 27°29'46"N, 89°45'48"E, 2820 m, 30.VI.2007, leg. P. KAUTT & S. NAUMAN (CAHU, CSIF); 2 ♂♂, Bhutan, Dung Dung, Nobding, 27°32'N, 90°11'E, 1700 m, 1.-3.VII.2009, V. SINIAEV (CVSM); 2 ♂♂, Bhutan, Punaka, Shatem camp, 27°43'N, 89°45'E, 1500 m, 28.-29.VI.2009, V. SINIAEV (CVSM); 2 ♂♂, Bhutan, Pele La Pass, 27°33'N, 90°12'E, 29.-30.VI.2009, 3279 m, leg. V. SINIAEV (CVSM); 1 ♂, Bhutan, Mo chu river, 27°43'N, 89°45'E, 1500 m, 19.-20.X.2009, leg. YU. BEZVERKHOV & V. SINIAEV (CYBM).

Distribution: Northern India, Nepal, Bhutan, southern and eastern China (Xizang, Fuijan, Guangdong, Shaanxi, Hubei, Hunan, Jiangxi, Guanxi, Sichuan, Yunnan, Guizhou, Gansu), northern Thailand, Laos, Vietnam. First record from Bhutan.

Kunugia burmensis (GADE, 1932)

Dendrolimus burmensis GADE, 1932, Gross-Schmett. Erde 2 (Suppl.): 123. Type locality: [Myanmar] Burma, Hpiamaw Fort by Myitkyina, 2700 m. Lectotype ♂ (BMNH) [examined].

References: DIERL (1975, as Dendrolimus burmensis GADE).

Material: No fresh material at our disposal.

Distribution: Myanmar, southern China (Yunnan), Bhutan, northern Vietnam and northern Thailand. DIERL listed the species from Thimphu.

Kunugia vulpina (MOORE, 1879)

Lebeda vulpina MOORE, 1879, in HEWITSON & MOORE, Descr. new Indian lepid. Insects colln late Mr. W. S. ATKINSON I: 81. Type locality: India, Darjiling. Holotype ♂ (ZMZH) [examined].

Material: 1, Bhutan (Central), 9 km E Wangdu, Phodring Kichu Resort, 1300 m, 7.VIII.2005, leg. A. HAUENSTEIN & P. KAUTT (CAHU).


Kunugia dzong spec. nov. (col. pl. 1: 1)

Holotype ♂, Bhutan (East), Mongar Dzongkhag, forest road 6 km SW Limi thingh, 27°13'12"N, 91°07'39"E, 1600 m, 15.VI.2007, leg. P. KAUTT & S. NAUMAN (CSIF).

Paratype: 1, Bhutan (East), Mongar Dzongkhag, forest road 6 km SW Limi thingh, 27°13'12"N, 91°07'39"E, 1600 m, 1.VI.2007, leg. P. KAUTT & S. NAUMAN (CAHU).

Diagnosis: Forewing length measures 33-34 mm. Externally the species is quite similar to other species of the quadrilineata-group; for this group four oblique dark grey, almost parallel, medial fascia are typical for dark pinkish sandy ground colour of the forewing. The genitalia are diagnostic (figs 1, 2); valves are short, with short apex and distinctly swollen bases, distal processes of vinculum basally fused, with a pair of separate triangular inner processes; aedeagus short, with slender apical spur and distinct and high basal tubular sclerotization of vesica. The vesica bears a long and strong, bent, needle-shaped cornutus.

Distribution: The species is known only from Bhutan so far.

Etymology: "Dzong" is a distinctive type of fortress architecture found in Bhutan, massive in style, with towering exterior walls surrounding a complex of courtyards, temples, administrative offices, and monks’ accommodation.

Dendrolimus himalayanus TSAI & LIU, 1964

Acta entomol. Sinica 13: 240, pl. 1, fig. 6, pl. III: 31-33. Type locality: China, Sitzang, Yatung. Holotype ♂ (IZAS) [not examined].

Material: 18 ♂♂, 1 ♀, Central Bhutan, Distr. Punakte, Dochu-La, E-side, 2800 m, 30.VI.2003, leg. A. HAUENSTEIN, P. KAUTT (CAHU); 2 ♂♂, W. Bhutan, Paro, 9500 ft, 22.VI.1933 and 15.VII.1933, F. LUDLOW & G. SHERIFF (BMNH); 34 ♂♂, Bhutan (West), Jhomolhari Trek, 3 km N Shana zoom, 2850 m, 4.VII.2005, leg. A. HAUENSTEIN & P. KAUTT (CAHU); 22 ♂♂, Bhutan (Central), Wangpe Phodrang Dzongkhag, Chuzomza - Tshelung, 9 km NE Chuzomza, 27°31'99", 90°32'57"E, 2000 m, 20.VI.2007, leg. P. KAUTT & S. NAUMAN (CAHU); 7 ♂♂, Bhutan (Central), Trongsa Ngangkhag, road Thangsa-Yolog La, 5 km NE Trongsa, 27°31'99", 90°32'57"E, 3040 m, 19.VI.2007, leg. P. KAUTT & S. NAUMAN (CSIF); 1 ♂, Bhutan (West), Paro Dzongkhag, forest road 9 km SSW Paro, 27°21'17", 89°22'53"E, 3050 m, 21.VI.2007, leg. P. KAUTT & S. NAUMAN (CSIF); 5 ♂♂, Bhutan, Dung Dung, Nobding, 27°32'N, 90°11'E, 1970 m, 23.-27.IV.2009, leg. V. SINIAEV (CVSM); 2 ♂♂, 1♀, Bhutan, Bumthang, 27°31'99", 90°33'55", 1200-2400 m, 7.-9.VI.2009, V. SINIAEV (CVSM).

Distribution: Northern India, Nepal, southern China (Tibet), Bhutan.

Paralebeda plagifera (WALKER, 1855)


References: DIERL (1975).

Material: 3 ♂♂, 3 ♀♀, breeding ex ovo 26.IX.2007, Bhutan (Central), Wangpe Phodrang Dzongkhag, Chuzomza - Tshelung, 9 km NE Chuzomza, 27°31'99", 90°32'57"E, 2000 m (6 from 20.VI.2007), leg. P. KAUTT & S. NAUMAN (CSIF); 1 ♂, 8 ♀♀, breeding ex ovo, 6.X.2003, Bhutan, Paro (6 from 25.VI.2003), leg. A. HAUENSTEIN, P. KAUTT (CSIF); 1 ♂, Bhutan, Punaka, Shatem camp, 27°43'N, 89°45'E, 1500 m, 28.-29.VI.2009, leg. V. SINIAEV (CVSM); 1 ♂, Bhutan, Dung Dung, Nobding, 27°32'N, 90°11'E, 1970 m, 1.-3.VII.2009, leg. V. SINIAEV (CVSM).

Distribution: Northern and central India, Nepal, southern and south-eastern China, Bhutan, northern Thailand, Laos and northern Vietnam. DIERL listed the species from Wangdi Phodrang 1300 m.

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Lasiocampa femorata  
**Type**: Entomofauna Z 2820 m, 10.VI.2007, leg. P .

**Material:**

Material: 1

**References:**

cfcf, 1

**Distribution:** India, Sri Lanka, Myanmar, South China, Bhutan, Thailand, Laos, Vietnam, Malaysia, Philippines, Sumatra, Borneo, Java.

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Syrastrena minor  
**Type**: Entomofauna Z 2820 m, 10.VI.2007, leg. P .

**Material:**

Material: 1

**References:**

cfcf, 1

**Distribution:** Northern India, Nepal, Bhutan.

Syrastrena lajonquierei  
**Type**: Entomofauna Z 2820 m, 10.VI.2007, leg. P .

**Material:**

Material: 1

**References:**

cfcf, 1

**Distribution:** Northern India, Nepal, Bhutan.

Material: 7♂, Buxa, Bhutan (BMNH); 2♂, Bhutan (BMNH); 1♂, Bhutan, Chille La Pass, 27°22'N, 89°21'E, 3595 m, 13.-16. VII. 2009, V. SINAJ (CVSM); 5♂, Bhutan, Pele La Pass, 27°33'N, 90°12'E, 17.VII.2009, 3279 m, leg. V. SINAJ (CVSM).

Distribution: India, Nepal, Bhutan, southern China (Sichuan, Yunnan, Gansu, Shaanxi), Myanmar, Vietnam.

Odonestis pruni (LINNAEUS, 1758)

Phalaena (Bombyx) pruni (LINNAEUS, 1758), Syst. Nat. (Ed. 10) : 498. Type locality: 'Germania'. Types: (not found).

Odonestis pruni obtruheuer TAMS, 1935

Mem. Mus. Royal Hist. nat. Belgique 4 (12): 57, pl. 6, figs 8, 9, pl. 8: 5. Type locality: [China, Sichuan] <frontiere orientale du Tibet>.

Holotype ♂ (BMNH) [examined].

Material: 20♂, 1♀, Bhutan (West), Jhomolhari Trek, 3 km N Shana Zampa, 2850 m, 4.VIII.2005, leg. A. HAUENSTEIN & P. KAUTT (CAHU); 3♂, Bhutan (West), Thimpu Dzongkhag, 1.5 km NE Dcho Lu, 27°29'46"N 89°45'E, 2820 m, 10.VI.2007, leg. P. KAUTT & S. NAUMANN (CAHU, CSIF).

Distribution: Europe, Caucasus and Siberia (the nominate form); Far East of Russia, Korea, China (Heilongjiang, Jilin, Liaoning, Hebei, Beijing, Nei Monggu, Shanxi, Ningxia, Gansu, Shaanxi, Shandong, Henan, Jiangsu, Anhui, Hubei, Zhejiang, Jiangxi, Fujian, Guangdong, Hunan, Guizhou, Guangxi), Japan (tusenese KARDAKOFF, 1928); southern China (Xizang, Sichuan, Yunnan), northern India, Nepal, Bhutan, north-eastern Myanmar, Vietnam (obtruheuer TAMS, 1935).

Argosistles flammans (HAMPSON, 1892)

Bharetta flammans HAMPSON, 1892, Fauna Brit. India 1: 416. Type locality: [India] Manipur 6000 ft. Holotype ♂ (BMNH) [examined].

Material: 1♂, Bhutan, 20.VI.1889, J. G. FLETCHER (BMNH); 1♂, Bhutan, Mongar, Thebong, 27°07'N, 91°20'W, 2273 m, 26.X.2009, YU. BEZVERKHOV & V. SINAJ (CYBM).

Distribution: India, Nepal, Bhutan, southern China (Yunnan), northern Thailand, Vietnam, Laos.

Kosala kadoi spec. nov. (col. pl. 1: 5)

Holotype ♂, Bhutan (Central), 9 km E Wangdue, Phodrang Kichu Resort, 1300 m, 7.VII.2005, leg. A. HAUENSTEIN & P. KAUTT (CAHU).

Paratypes: 8♂, 1♀, Bhutan (Central), 9 km E Wangdue, Phodrang Kichu Resort, 1300 m, 7.VII.2005, leg. A. HAUENSTEIN & P. KAUTT (CAHU); 1♂, Bhutan (Central), Trongsa Dzongkhag, road Trongsa-Yotong La, 5 km NE Trongsa, 27°31'19"N 90°22'57"E, 3040 m, 19.VI.2007, leg. P. KAUTT & S. NAUMANN (CAHU); 2♂, Bhutan (Central), 9 km E Wangdue, Phodrang Kichu Resort, 1300 m, 7.VIII.2005, leg. A. HAUENSTEIN & P. KAUTT (CAHU); 3♂, Bhutan, Dung Dung, Nobding, 27°32'N, 90°11'E, H-1970 m, 1.-3. VII.2009, leg. V. SINAJ (CVSM); 5♂, 1♀, Bhutan, Pele La Pass, 27°33'N, 90°12'E, 29-30.VI.2009, H-3279 m, leg. V. SINAJ (CVSM); 1♂, Bhutan (West), Jhomolhari Trek, Jangothang, base camp north side, 4150 m, 2.VII.2005, leg. A. HAUENSTEIN & P. KAUTT (CAHU); 1♂, Bhutan (West), Jhomolhari Trek, Jangothang, base camp north side, 4150 m, 2.VII.2005, leg. A. HAUENSTEIN & P. KAUTT (MWM); 1♂, Bhutan (Central), Trongsa Dzongkhag, road Trongsa-Yotong La, 5 km NE Trongsa, 27°31'19"N 90°32'57"E, 3040 m, 19.VI.2007, leg. P. KAUTT & S. NAUMANN (CSIF); 1♂, Bhutan (West), road Paro-Ha, ca. 30 km, Strawberry-Camp, 3300 m, 28.VII.2005, leg. A. HAUENSTEIN & P. KAUTT (CSIF); 5♂, Bhutan (West), road Paro-Ha, ca. 30 km, Strawberry-Camp, 3300 m, 28.VII.2005, leg. A. HAUENSTEIN, P. KAUTT & S. NAUMANN (MWM); 1♂, Bhutan (West), Distr. Paro, 7 km SW Paro, road to Chele-la, 3300 m, 25.VI.2005, leg. A. HAUENSTEIN & P. KAUTT & S. NAUMANN (MWM); 1♂, Bhutan (West), Distr. Paro, 5 km N Paro, Do Chu valley, 2350 m, 24.VI.-6.VII.2005, leg. A. HAUENSTEIN & P. KAUTT (MWM); 3♂, 1♀, Bhutan, Bumthang, 27°31'N, 90°33'W, 2420 m, 7.-9.VII.2009, V. SINAJ (CVSM); 3♂, 1♀, Bhutan, Pele La Pass, 27°33'N, 90°12'E, 29-30.VI.2009, 3279 m, leg. V. SINAJ (CVSM).

Diagnosis: Forewing length is 16-19 mm. The species is closely related to Kosala flavosignata (MOORE, 1879) and seems to be its vicariant in high mountain ranges of Bhutan (1300-4150 m). Being very closely related in genitalia structures (figs 5, 6), the species is easily differentiated by external characters, where loss or reduction of reddish colour is diagnostic; K. kado spec. nov. is also smaller (forewing length in flavosignata is 18-22 mm). Forewings with whitish medial field and contrasting blackish medios, species is easily differentiated by external characters, where loss or reduction of reddish colour is diagnostic; K. kado spec. nov. is also smaller (forewing length in flavosignata is 18-22 mm).

Distribution: In high mountain ranges of Bhutan.

Etymology: The species is named in honour of Dasho KADO (Thimphu, Bhutan) for his merit in lepidopterological investigations of ARMIN HAUENSTEIN in Bhutan and support of all his trips.

Alompra farraginea MOORE 1912


References: DUDGEON (1901: 409); FLETCHER (1925: 16).

Material: No material at our disposal.

Comments: The ♂ of the species was firstly described from the material collected in Bhutan at altitudes of about 2000 ft. (DUDGEON, l.c.). Hence, we are not sure in the correct identification, and it is very probably that the related Alompra roquepei TAMS, 1953 was implicated. The long-term confusion of both species was likely at that time, and both species can be found in Bhutan.

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References


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1-6: genitalia of Bhutanese Lasiocampidae. (1-2) Kunugia dzong spec. nov.: (1) holotype (aedeagus extracted), (2) paratype, aedeagus with vesica fully inverted. (3) Stenophylloides moorei Zolotuhin, 2005, aedeagus extracted, Bhutan (West), Thimpu Dzongkhag, Mo Chu-valley, 16 km NW Punakha, 1500 m, 11.VI.2007, leg. P. KAUTT & S. NAUMANN (CAHU). (4) Amurilla subpurpurea dharmasubspec. nov., paratype (aedeagus and sternum 8 separated), Bhutan (Central), 9 km E Wangdue, Phodrang Kichu Resort, 1300 m, 7.VIII.2005, leg. A. HAUENSTEIN & P. KAUTT (CAHU). (5-6) Kosala kudo spec. nov.: (5) paratype (aedeagus and sternum 8 separated), Bhutan (Central), 9 km E Wangdue, Phodrang Kichu Resort, 1300 m, 7.VIII.2005, leg. A. HAUENSTEIN & P. KAUTT (MWM); (6) paratype, sternum 8, the same data (MWM).
1: Kunugia dzong spec. nov., holotype ♀ (CSIF).
2: Kunugia loelavig spec. nov., holotype ♂ (see p. 38).
3: Amurilla subpurpurea dharma subspec. nov., holotype ♂.
4: Stenophylloides moorei Zolotuhin, 2005, ♂, Bhutan (West), Thimpu Dzongkhag, Mo Chu-valley, 16 km NW Punakha, 1500 m, 11.VI.2007, leg. P. KAUTT & S. NAUMANN (CAHU);
5: Kosala kado spec. nov., paratype ♂, Bhutan (Central), 9 km E Wangdue, Phodrang Kichu Resort, 1300 m, 7.VIII.2005, leg. A. HAUNSTEIN & P. KAUTT (MWM).

Scale bar 1 cm.