

The Lasiocampidae of Bhutan

(Lepidoptera, Lasiocampidae)

by

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Abstract: 42 species of the Lasiocampidae collected after field trips by HAUENSTEIN 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 HAUENSTEIN 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 the 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 KHESAR NAMGYEL WANGCHUCK, 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 that 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, Raidak, 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 Shiwalik 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 SINJAEV 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. HAUENSTEIN & P. KAUTT;
- 26.VII. - 8.VIII.2005, A. HAUENSTEIN, P. KAUTT & S. NAUMANN;
- 9.VI. - 23.VI.2007, P. KAUTT & S. NAUMANN;
- 5.V. - 19.V.2010, A. HAUENSTEIN & ROBERT TRUSCH & PETER FRANKENBERG & MICHAEL RATZEL.

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:

BMNH: The Natural History Museum, London, U.K.;

CAHU: private collection of ARMIN HAUENSTEIN, Untermünkheim, Germany;

CSIF: private collection of SIEGFRIED IHLE, Filderstadt, Germany;

CVSM: private collection of VIKTOR SINJAEV, Moscow, Russia;

CYBM: private collection of YURI BEZVERKHOV, Moscow, Russia;

IZAS: Institute of Zoology, Academia Sinica, Beijing, China;

MWM: Entomologisches Museum WITT, Munich, Germany;

ZFMK: Zoologisches Forschungsinstitut und Museum ALEXANDER KOENIG, Bonn, Germany;

ZISP: Zoological Museum of Russian Academy of Sciences, Sankt Petersburg, Russia;

ZMHU: Zoologisches Museum der Humboldt Universität zu Berlin, Germany.

Annotated checklist of the species

Amurilla subpurpurea (BUTLER, 1881)

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

Amurilla subpurpurea d h a r m a subsp. nov. (col. pl. 1: 3)

Holotype ♂, Bhutan (Central), 9 km E Wangdue, Phodrang Kichu Resort, 1300 m, 7.VIII.2005, leg. A. HAUENSTEIN & P. KAUTT (CAHU). Paratypes: 8 ♂♂ Bhutan (Central), 9 km E Wangdue, Phodrang Kichu Resort, 1300 m, 7.VIII.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°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. HAUENSTEIN & 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, Pele 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 *A. rubra* (HAMPSON, 1896), but with wings shorter and broader. Dark weakly semitransparent hind wings (dark pinkish with violet grey outer margin) are 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.

Taxonomical 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. *kansuensis* O. BANG-HAAS, 1939 to Central China (Prov. Gansu and Shaanxi) and large, dark, contrasty patterned ssp. *obscurior* ZOLOTUHIN & WITT, 2000 - to Northern Vietnam, Thailand and Southern China (Yunnan, Sichuan).

Etymology: „Dharma“ (Sanskrit: dhárma) 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“.

Baoderia khasiana (MOORE, 1879)

Trichiura khasiana MOORE, 1879, in HEWITSON & MOORE, Descr. new Indian lepid. Insects colln late Mr. W. S. ATKINSON **1**: 82, pl. 3: 21. Type locality: [Northern India] Khasia Hills. Holotype ♂ (ZHUB) [examined].

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

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

Trabala vishnou (LEFEBVRE, 1827)

Gastropacha vishnou 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. HAUENSTEIN & P. KAUTT (CAHU); 7 ♂♂, 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. KAUTT & S. NAUMANN (CAHU); 2 ♂♂, 2 ♀♀, Bhutan central, Wangdue Phodrang Dzongkhag, Chuzomsa, 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.

***Crinocraspeda 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.

***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 ♂ (MWM) [examined].

Material: 1 ♂, Bhutan (West), Thimpu Dzongkhag, 1,5 km NE Dochu La, 27°29'46"N, 89°45'48"E, 2820 m, 10.VI.2007, leg. P. KAUTT & S. NAUMANN (CSIF); 1 ♀, Bhutan (Central), Trongsa Dzongkhag, Chuzomsa, 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. SINJAEV (CVSM).

Distribution: Northern India, Nepal, Bhutan.

***Euthrix inobtrusa* (WALKER, 1862)**

Lasiocampa inobtrusa WALKER, 1862, Trans. Ent. Soc. London 1: 85. Type locality: 'Hindostan'. Holotype ♂ (coll. Oxford University) [examined].

Material: 1 ♂, Bhutan, 6.VI.[18]89, leg. J. G. PILCHER (BMNH).

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

***Euthrix isocyma* (HAMPSON, 1892)**

Odonestis isocyma HAMPSON, 1892, Fauna Br. India incl. Ceylon and Burma, Moths 1: 427. Type locality: Assam, Naga Hills. Holotype ♂ (BMNH) [examined].

Material: 3 ♂♂, Bhutan (Central), Wangdue Phodrang Dzongkhag, road Chuzomsa Tseshinang, 9 km NE Chuzomsa, 27°31'19"N, 90°32'57"E, 2000 m, 20.VI.2007, leg. P. KAUTT & S. NAUMANN (CAHU); 2 ♂♂, 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. KAUTT & S. NAUMANN (CAHU); 1 ♂, 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. KAUTT & S. NAUMANN (CSIF).

Distribution: From northern India, Nepal and Bhutan to south-eastern China (Yunnan, Simao, Sichuan, Guizhou, Xizang, Shaanxi, Hubei, Hunan, Hainan, Fujian, Guangxi, Guangdong), Myanmar, Laos, Thailand, northern Vietnam, and Cambodia.

***Euthrix laeta* (WALKER, 1855)**

Amydona laeta WALKER, 1855, List Spec. Lepid. Colln Brit. Mus. 6: 1416. Type locality: [northern India] Assam. Lectotype ♀ (BMNH) [examined].

Material: 1 ♀, central Bhutan, Wangdue Phodrang Dzongkhag, road Chuzomsa Tseshinang, 9 km NE Chuzomsa, 27°31'19"N, 90°32'57"E, 2000 m, 20.VI.2007, leg. P. KAUTT & S. NAUMANN (CAHU).

Distribution: From Russian Far East, Korea and Japan, over China (incl. Taiwan) to Nepal, Bhutan, India, Sri Lanka, Myanmar, Thailand, Vietnam, Laos, Peninsular Malaysia, Sumatra, Borneo, Philippines (Palawan, Balabac) and Java.

***Euthrix fossa* (SWINHOE, 1879)**

Odonestis fossa SWINHOE, 1879, Ann. Mag. Nat. Hist. 19: 410. Type locality: India, Jaintia Hills. Holotype ♂ (BMNH) [examined].

Material: 1 ♂, Bhutan, Trongsa, Chendebji, 27°30'N, 90°18'E, 2500 m, 22.X.2009, leg. Yu. BEZVERKHOV & V. SINJAEV (CYBM); 1 ♂, Bhutan, Sambrup - Jongkhar, 26°56'N, 91°33'E, 27.X.2009, 2273 m, leg. Yu. BEZVERKHOV & V. SINJAEV (CYBM).

Distribution: Northern India, Bhutan; the ssp. *mariae* ZOLOTUHIN, 2001, in northern Thailand and Laos.

***Eteinopla signata* (MOORE, 1879)**

Odonestis signata MOORE, 1879, in HEWITSON & MOORE, Descr. new Indian lepid. Insects colln late Mr. W. S. ATKINSON 1: 76. Type locality: India, Darjeeling. Holotype ♂ (ZHUB) [examined].

References: DUDGEON (1901: 411, as *Odonestis signata* MOORE); FLETCHER (1925: 25, as *Odonestis signata* MOORE).

Material: 1 ♂, central Bhutan, Wangdue Phodrang Dzongkhag, road Chuzomsa Tseshinang, 9 km NE Chuzomsa, 27°31'19"N, 90°32'57"E, 2000 m, 20.VI.2007, leg. P. KAUTT & S. NAUMANN (CSIF); 1 ♂, Bhutan, Mo Chu river, 27°43'N, 89°45'E, 1500 m, 19.-20.X.2009, leg. Yu. BEZVERKHOV & V. SINJAEV (CYBM).

Distribution: Northern India, Nepal, Southern China, Bhutan, Thailand, Laos, Vietnam and Peninsular Malaysia.

***Lenodora castanea* (HAMPSON, 1892)**

Odonestis castanea HAMPSON, 1892, Fauna Brit. Ind., Moths 1: 426. Type locality: India, Sikkim. Lectotype ♂ (BMNH) [examined].

Material: 11 ♂♂, Bhutan (West), Jhomolhari Trek, Shana Zampa, 2850 m, 29.VII.2005, leg. A. HAUENSTEIN, P. KAUTT & S. NAUMANN (CAHU); 1 ♂, 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. KAUTT & S. NAUMANN (CAHU); 1 ♂, Bhutan, Bumthang, 27°31'N, 90°33'E, H~2420 m, 7.-9.VII.2009, V. SINJAEV (CVSM).

Distribution: Northern India, Nepal, Bhutan, south-western China (Xizang).

***Micropacha lidderdalii* (DRUCE, 1899)**

Odonestis lidderdalii DRUCE, 1899, Ann. Mag. Nat. Hist. (7) 3: 471. Type locality: [northern India] Darjeeling. Holotype ♀ (BMNH) [examined].

References: DIERL (1975, as *Odonestis lidderdalii* DRUCE).

Material: 9 ♂♂, 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. KAUTT & S. NAUMANN (CAHU); 2 ♂♂, Bhutan (Central), Trongsa Dzongkhag, Chuzomsa, Kichu Resort, 27°30'22"N, 89°57'36"E, 1360 m, 12.VI.2007, leg. P. KAUTT & S. NAUMANN (CAHU); 3 ♂♂, 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. KAUTT & S. NAUMANN (CSIF); 3 ♂♂, Bhutan, Punakha, Shatem Camp, 27°43'N, 89°45'E, H~1500 m, 28.-29.VI.2009, V. SINJAEV (CVSM). DIERL listed the species also from 21 km east Wangdi Phodrang, 1700-2000 m.

Distribution: Northern India, Nepal, Bhutan.

***Radhica flavovittata* MOORE, 1879**

In HEWITSON & MOORE, Descr. new Indian lepid. Insects colln late Mr. W. S. ATKINSON 1: 79. Type locality: India, Nainital. Lectotype ♂ (ZHUB) [examined].

References: HAMPSON (1892: 412, as *Arguda flavovittata* MOORE); FLETCHER (1925: 12, as *Arguda flavovittata* MOORE).

Material: 1 ♂, Bhutan, IX.1885, MOLLER (BMNH); 4 ♂♂, 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. KAUTT & S. NAUMANN (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 ♂ (ZFMK) [examined].

Material: 1 ♂, Bhutan, 4 km W Singor, 27°21'N, 91°02'E, 2420 m, 25.X.2009, leg. YU. BEZVERKHOV & V. SINJAEV (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 ♂ (ZFMK) [examined].

Material: Holotype ♂, 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 ♂ (BMNH) [examined].

References: DUDGEON (1901: 410, as *Estigena pardalis* WLK.); FLETCHER (1925: 21, as *Estigena pardalis* WLK.).

Material: 1 ♂, Bhutan, Mo Chu river, 27°43'N, 89°45'E, 1500 m, 19.-20.X.2009, leg. YU. BEZVERKHOV & V. SINJAEV (CYBM).

Distribution: Pakistan, India, southern China, Taiwan, Thailand, Laos, Vietnam, Malaysia, Java, Sumatra.

Comments: The citations given above are needed confirmation because of the extreme similarity of all species of the *Estigena*-group.

***Estigena philippinensis* (TAMS, 1935)**

Gastropacha pardale philippinensis TAMS, 1935, Mem. Mus. Royal Hist. Nat. Belgique 4 (12): 51, pl. III: 9. Type locality: Philippines, Luzon, subprov. Benguet, Klondyke. Holotype ♂ (BMNH) [examined].

***Estigena philippinensis swanni* (TAMS, 1935)**

Gastropacha pardale swanni TAMS, 1935, Mem. Mus. Royal Hist. Nat. Belgique 4 (12): 52, text fig. 3. Type locality: Upper Burma, Htawgaw. Holotype ♂ (BMNH) [examined].

Material: 2 ♂♂, Bhutan, Morong, Sambrup - Jongkhar, 26°56'N, 91°33'E, 2273 m, 20.-21.VII.2009, V. SINJAEV (CVSM).

Distribution: Pakistan, India, Nepal, Bhutan, Southern China (Fujian), Thailand, Laos, Vietnam, Myanmar, Borneo, Sumatra, Andaman Isl., the Philippines.

***Gastropacha (Stenophylloides) moorei* ZOLOTUHIN, 2005 (col. pl. 5: 4)**

Gastropacha moorei ZOLOTUHIN, 2005, Tinea 18(4): 304, figs 24-25, 50-51. Type locality: Nepal, Annapurna Himal, Geirigan village, 1340 m, 83°45'E, 28°20'N. Holotype ♂ (MWM) [examined].

Material: 1 ♂, 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. KAUTT & S. NAUMANN (CAHU).

Distribution: India, Nepal, Bhutan.

***Paradoxopla sinuata* (MOORE, 1879)**

Gastropacha sinuata MOORE, 1879, Descr. new Indian lepid. Insects Colln late Mr. W. S. ATKINSON 1: 76. Type locality: India, Darjeeling. Type ♂ (ZMHU) [examined].

Material: 4 ♂♂, Bhutan (West), Thimpu Dzongkhag, 1,5 km NE Dochu La, 27°29'46"N, 89°45'48"E, 2820 m, 10.VI.2007, leg. P. KAUTT & S. NAUMANN (CAHU); 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 (CAHU); 1 ♂, 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. KAUTT & S. NAUMANN (CAHU); 1 ♂, Bhutan (East), Mongar Dzongkhag, 5,5 km NNW Limithang, Yonkola 27°18'31"N, 91°09'48"E, 1600 m, 18.VI.2007, leg. P. KAUTT & S. NAUMANN (CSIF); 1 ♂, Bhutan (Central), Wangue Phodrang Dzongkhag, Chuzomsa - Tseshinang. 9 km NE Chuzomsa, 27°31'19"N, 90°32'57"E, 2000 m, 20.VI.2007, leg. P. KAUTT & S. NAUMANN (CSIF).

Distribution: Northern India, Pakistan, Nepal, southern and central China (ssp. *sinuata* MOORE), Vietnam, Myanmar and Thailand (ssp. *fabulosa* ZOLOTUHIN, 2005) and Taiwan (ssp. *taiwana* WILEMAN, 1915).

***Kunugia ampla* (WALKER, 1855)**

Odenestis (sic) *ampla* WALKER, 1855, List Lepid. Het. Colln Br. Mus. 6: 1412. Type locality: [Bangladesh, Sylhet] Silhet. Syntype ♀ (BMNH) [examined].

References: DUDGEON (1901: 407, as *Metanastria ampla* WLK.); FLETCHER (1925: 6, as *Metanastria ampla* WLK.); DIERL (1975, as *Metanastria ampla* WLK.).

Material: No fresh material at our disposal.

Distribution: India, Bangladesh, Southern China, Bhutan, Thailand, Laos, Vietnam, Peninsular Malaysia. DIERL listed the species from Wangdi Phodrang, 1300 m. DUDGEON (loc. cit.) pointed out caterpillars from Artemisia.

***Kunugia fulgens* (MOORE, 1879)**

Lebeda fulgens MOORE, 1879, in HEWITSON & MOORE, Descr. new Indian lepid. Insects colln late Mr. W. S. ATKINSON 1: 81. Type locality: Darjiling. Holotype ♂ (BMNH) [examined].

References: DUDGEON (1901: 407, as *Metanastria fulgens* MOORE); FLETCHER (1925: 6, as *Metanastria fulgens* MOORE).

Material: 1 ♀, Bhutan, 5 km S Tongsa Dzong, 27°27,8'N, 90°30,1'E, 1925 m, 30.IV.2009, leg. V. SINJAEV (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 1: 80. Type locality: Northern India, Darjeeling. Holotype ♂ (BMNH) [examined].

Lebeda Lidderdalii BUTLER, 1881, Ill. Heteroc. Ins. Coll. Brit. Mus. 5: 73, pl. 100: 1, 2. Type locality: Bhutan. Lectotype ♂ (BMNH) [examined]. References: BUTLER (1881: 73, as *Lebeda lidderdalii* BTL.); HAMPSON (1892: 410, as *Metanastria lidderdalii* BTL.); DUDGEON (1901: 407, as *Metanastria lidderdalii* BTL.); GRÜNBERG (1923: 395, pl. 34, row d, as *Metanastria lidderdalii* BTL.); FLETCHER (1925: 8, as *Dendrolimus lidderdalii* BTL.).

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

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

***Kunugia lineata* (MOORE, 1879)**

Lebeda lineata MOORE, 1879, in HEWITSON & MOORE, Descr. new Indian lepid. Insects colln late Mr. W. S. ATKINSON 1: 81. Type locality: India, Darjiling. Lectotype ♂ (ZMHU) [examined].

Material: 1 ♂, West Bhutan, Distr. Paro, 5 km N Paro, Do Chu valley, 2350 m, 24.VI.-6.VII.2003, leg. A. HAUENSTEIN & P. KAUTT (CAHU); 7 ♂♂, 1 ♀, Bhutan (West), Thimpu Dzongkhag, 1,5 km NE Dochu La, 27°29'46"N, 89°45'48"E, 2820 m, 10.VI.2007, leg. P. KAUTT & S. NAUMANN (CAHU, CSIF); 2 ♂♂, Bhutan, Dung Dung, Nobding, 27°32'N, 90°11'E, 1970 m, 1.-3.VII.2009, V. SINJAEV (CVSM); 2 ♂♂, Bhutan, Pele La Pass, 27°33'N, 90°12'E, 29.-30.VI.2009, 3279 m, leg. V. SINJAEV (CVSM); 1 ♀, Bhutan, Mo Chu river, 27°43'N, 89°45'E, 1500 m, 19.-20.X.2009, leg. YU. BEZVERKHOV & V. SINJAEV (CYBM).

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

***Kunugia burmensis* (GAEDE, 1932)**

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

References: DIERL (1975, as *Dendrolimus burmensis* GAEDE).

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 1: 81. Type locality: India, Darjiling. Holotype ♂ (ZMHU) [examined].

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

Distribution: Northern India, Myanmar, Thailand, Laos, southern China (ssp. *omeiensis* TSAI & LIU, 1964, northern Vietnam and northern Thailand (ssp. *victori* ZOLOTUHIN & WITT, 2000)).

***Kunugia dzongg* spec. nov. (col. pl. 1: 1)**

Holotype ♂, 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. KAUTT & S. NAUMANN (CSIF).

Paratype: 1 ♂, 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. KAUTT & S. NAUMANN (CAHU).

Diagnosis: Forewing length 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 ♂ genitalic characters are diagnostic (figs 1, 2): valvae 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. Punakha, Dochu-La, E-side, 2800 m, 30.VI.2003, leg. A. HAUENSTEIN, P. KAUTT (CAHU); 2 ♂♂, W. Bhutan, Paro, 9500 ft., 22.VI.1933 et 15.VII.1933, F. LUDLOW & G. SHERIFF (BMNH); 34 ♂♂, Bhutan (West), Jhomolhari Trek, 3 km N Shana Zampa, 2850 m, 4.VIII.2005, leg. A. HAUENSTEIN & P. KAUTT (CAHU); 22 ♂♂, Bhutan (Central), Wangue Phodrang Dzongkhag, Chuzomsa - Tseshinang, 9 km NE Chuzomsa, 27°31'19"N, 90°32'57"E, 2000 m, 20.VI.2007, leg. P. KAUTT & S. NAUMANN (CAHU); 7 ♂♂, 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), Paro Dzongkhag, forest road 9 km SSW Paro, 27°21'17"N, 89°22'53"E, 3050 m, 21.VI.2007, leg. P. KAUTT & S. NAUMANN (CSIF); 5 ♂♂, Bhutan, Dung Dung, Nobding, 27°32'N, 90°11'E, H~1970m, 23.-27.IV.2009, leg. V. SINJAEV (CVSM); 2 ♂♂, 1 ♀, Bhutan, Bumthang, 27°31'N, 90°33'E, H~2420 m, 7.-9.VII.2009, V. SINJAEV (CVSM).

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

***Paralebeda plagifera* (WALKER, 1855)**

Lebeda plagifera WALKER, 1855, List. Spec. lepid. Ins. Colln Br. Mus. 6: 1459. Type locality: Nepal. Holotype ♀ (BMNH) [examined].

References: DIERL (1975).

Material: 3 ♂♂, 3 ♀♀, breeding ex ovo 26.IX.2007, Bhutan (Central), Wangue Phodrang Dzongkhag, Chuzomsa - Tseshinang, 9 km NE Chuzomsa, 27°31'19"N, 90°32'57"E, 2000 m (♀ from 20.VI.2007), leg. P. KAUTT & S. NAUMANN (CSIF); 1 ♂, 8 ♀♀, breeding ex ovo, 6.X.2003, Bhutan, Paro (♀ from 25.VI.2003), leg. A. HAUENSTEIN, P. KAUTT (CSIF); 1 ♂, Bhutan, Punakha, Shatem Camp, 27°43'N, 89°45"E, 1500 m, 28.-29.VI.2009, leg. V. SINJAEV (CVSM); 1 ♀, Bhutan, Dung Dung, Nobding, 27°32'N, 90°11'E, 1970 m, 1.-3.VII.2009, leg. V. SINJAEV (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.

***Paralebeda femorata* (MÉNÉTRIËS, 1858)**

Lasiocampa femorata MINJAEV 1858, Bull. Acad. Imp. Sci. St. Petersburg **17** (24): 218. Type locality: [Russia] Amur region. Holotype ♀ (ZISP) [examined].

***Paralebeda femorata karmata* ZOLOTUHIN, 1996**

Entomofauna **17** (13): 249, fig. 6. Type locality: north-western Pakistan, Hazara, Nathiagali, 2400-2600 m. Holotype ♂ (ZSM, Munich) [examined].

Material: 1♂, Bhutan, 10.VI.1889, leg. J. G. PILCHER (BMNH); 1♂, Bhutan, 2.VII.1889, J. G. PILCHER (BMNH); 1♀, Bhutan, 10.VII.1889, leg. J. G. PILCHER (BMNH); 3♂♂, West Bhutan, Distr. Paro, 5 km N Paro, Do Chu-valley, 2350 m, 24.VI.-6.VII.2003, leg. A. HAUENSTEIN & P. KAUTT (CAHU); 1♂, 1♀, Bhutan (West), Thimpu Dzongkhag, 1,5 km NE Dochu La, 27°29'46"N, 89°45'48"E, 2820 m, 10.VI.2007, leg. P. KAUTT & S. NAUMANN (CSIF); 1♂, Bhutan, Dung Dung, Nobding, 27°32'N, 90°11'E, 1970 m, 1.-3.VII.2009, leg. V. SINJAEV (CVSM); 1♀, Bhutan, Bumthang, 27°31'N, 90°33'E, 2420 m, 7.-9.VII.2009, leg. V. SINJAEV (CVSM).

Distribution: From Russian Far East, Korea, north-eastern and eastern China (ssp. *femorata* MÉNÉTRIËS), Taiwan (ssp. *mirabilis* ZOLOTUHIN, 1996) to Nepal, Bhutan, India and north-eastern Pakistan (ssp. *karmata* ZOLOTUHIN, 1996) and northern Vietnam (ssp. *titanica* ZOLOTUHIN & WITT, 2000).

***Suana concolor* (WALKER, 1855)**

Lebeda concolor WALKER, 1855, List Spec. lepid. Ins. Colln Br. Mus. **6**: 1463. Type locality: North India, Silhet. Lectotype ♂ (BMNH, London) [examined].

References: DUDGEON (1901: 406); FLETCHER (1925: 3).

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

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

***Metanastria near hyrtaca* (CRAMER, 1779)**

Phalaena (Bombyx) hyrtaca CRAMER, 1779, Uitlandsche Kapellen (Papillons exot.) **3**: 97, pl. 249 F. Type locality: stated to be Surinam; this was an error, for *Phalaena hyrtaca* is not known from the New World, but occurs in Oriental region. Types: (BMNH) [not found].

Material: 3♂♂, Bhutan (Central), 9 km E Wangdue, Phodrang Kichu Resort, 1300 m, 7.VIII.2005, leg. A. HAUENSTEIN, P. KAUTT (CAHU); 2♂♂, Bhutan, Morong, Sambrup - Jongkhar, 26°56'N, 91°33'E, 2273 m, 20.-21.VII.2009, V. SINJAEV (CVSM); 3♂♂, Bhutan, Punakha, Shatem Camp, 27°43'N, 89°45'E, 1500 m, 28.-29.VI.2009, V. SINJAEV (CVSM); 2♂♂, Bhutan, Pele La Pass, 27°33'N, 90°12'E, 29.-30.VI.2009, 3279 m, leg. V. SINJAEV (CVSM).

Distribution: India, Nepal, Bhutan, China (Fujian, Jiangxi, Hubei, Hunan, Guangdong, Guangxi, Sichuan, Yunnan, Gansu, Hainan, Taiwan), Myanmar, Thailand, Vietnam, Malaysia, Sumatra, Borneo.

***Lebeda nobilis* WALKER, 1855**

List. Spec. lepid. Ins. Colln Br. Mus. **6**: 1456. Type locality: Nepal and Silhet. Syntypes ♂ & ♀ (BMNH) [examined].

References: DUDGEON (1901: 406); FLETCHER (1925: 4).

Material: No fresh material at our disposal.

Distribution: India, Nepal, central and southern China, Taiwan, Bhutan, Thailand, Vietnam, Laos, Peninsular Malaysia, Sumatra, Java.

***Pyrosis hreblayi* ZOLOTUHIN & WITT, 2000**

Tinea **16** Suppl. 1: 159, pl. 174: 11, 12, text-fig. 1515. Type locality: Nepal, Koshi, Terhathum area above Gorja, Tshisopami, 2600 m, 87°37'E, 27°21'N. Holotype ♂ (MWM) [examined].

Material: 1♂, Bhutan, Dung Dung Nyelsa, 27°32'N, 90°11'E, 2970 m, 21.X.2009, leg. Yu. BEZVERKHOV & V. SINJAEV (CYBM); 2♂♂, Bhutan, 4 km W Singor, 27°21'N, 91°02'E, 2,420 m, 25.X.2009, leg. Yu. BEZVERKHOV & V. SINJAEV (CYBM); 2♂♂, Bhutan, Mongar, Thebong, 27°07'N, 91°20'E, 2273 m, 26.X.2009, leg. Yu. BEZVERKHOV & V. SINJAEV (CYBM).

Distribution: Eastern Nepal, Bhutan.

***Arguda vinata* MOORE, 1865**

Proc. Zool. Soc. London **1865**: 820. Type locality: Sikkim, Darjeeling. Holotype ♂ (ZHUB) [examined].

***Arguda vinata nepalina* KISHIDA, 1992**

Moths Nepal **1** (*Tinea* **13** Suppl. 2): 77, fig. 55; pl. 20: 3. Type locality: Nepal, Godavari. Holotype ♂ (by original designation) (NSMT) [examined].

Material: 20♂♂, Bhutan, Buxa (BMNH); 25♂♂, Bhutan (West), Jhomolhari Trek, 3 km N Shana Zampa, 2850 m, 4.VIII.2005, leg. A. HAUENSTEIN & P. KAUTT (CAHU); 1♂ Bhutan (Central), Wangue Phodrang Dzongkhag, road Chuzomsa - Tseshinang, 9 km NE Chuzomsa, 27°31'19"N, 90°32'57"E, 2000 m, 20.VI.2007, leg. P. KAUTT & S. NAUMANN (CSIF); 1♂, Bhutan, Bumthang, 27°31'N, 90°33'E, 2420 m, 7.-9.VII.2009, leg. V. SINJAEV (CVSM); 1♀, Bhutan, Dung Dung, Nobding, 27°32'N, 90°11'E, 1970 m, 1.-3.VII.2009, leg. V. SINJAEV (CVSM).

Distribution: North-eastern India (Sikkim, higher altitudes), Nepal (ssp. *vinata* MOORE); north-eastern India (Sikkim, lower altitudes), Nepal, Bhutan, southern China (Yunnan, Sichuan, also Shaanxi), Myanmar, Thailand, northern Vietnam, Malaysia (ssp. *nepalina* KISHIDA).

***Arguda thaica* ZOLOTUHIN, 2005**

Moths of Thailand **4**: 125, figs 18A, 19G; pl. 18: 10, 12. Type locality: Thailand, Chiang Mai prov., Doi Inthanon National Park, km 37-38 road (N of) Chom Thong, summit just above checkpoint 2, 1730 m, lower montane forest. Holotype ♂ (MWM) [examined].

Material: 3♂♂, 1♀, Bhutan, Mongar, Thebong, 27°17'N, 91°20'E, 2273 m, 19.VII.2009, V. SINJAEV (CVSM).

Distribution: North-eastern India (Meghalaya), Bhutan, Vietnam, Laos and Thailand.

***Syrastrena minor* (MOORE, 1879)**

Metanastria minor MOORE, 1879, in HEWITSON & MOORE, Descr. new Indian lepid. Insects colln late Mr. W. S. ATKINSON **1**: 78. Type locality: [India] Darjiling. Lectotype ♂ (BMNH) [examined].

Material: 1♂, Bhutan, Mongar, Thebong, 27°17'N, 91°20'E, 2273 m, 19.VII.2009, V. SINJAEV (CVSM).

Distribution: Northern India, Nepal, Bhutan.

***Syrastrena lajonquierei* HOLLOWAY, 1982**

Intr. Moths SE Asia: 198, fig. 27. Type locality: north-eastern Myanmar, Kambaiti. Holotype ♂ (BMNH) [examined].

Material: 1♂, Bhutan (West), Thimpu Dzongkhag, 1,5 km NE Dochu La, 27°29'46" N 89°45'48"E, 2820 m, 10.VI.2007, leg. P. KAUTT & S. NAUMANN (CAHU); 2♂♂, Bhutan, Trongsa, 8 km E Chenberi, 27°27'N, 90°23'E, 2420 m, 4.-6.VII.2009, V. SINJAEV

(CVSM); 1 ♂, Bhutan, Mo Chu river, 27°43'N, 89°45'E, 1500 m, 19.-20.X.2009, leg. Yu. BEZVERKHOV & V. SINJAEV (CYBM). Distribution: Myanmar, northern Vietnam, Thailand (ssp. *lajonquierei* HOLL.) and Nepal (ssp. *fortelineata* ZOLOTUHIN & WITT, 2000).

***Bharettia cinnamomea* MOORE [1866]1865**

Proc. Zool. Soc. Lond. 1865: 820, pl. 43, fig. 6. Type locality: India, Darjeeling. Types: not found.

Material: 15 ♂♂, Buxa, Bhutan (BMNH); 4 ♂♂, Bhutan (BMNH); 3 ♂♂, Bhutan, Chille La Pass, 27°22'N, 89°21'E, 3595 m, 13.-16. VII.2009, V. SINJAEV (CVSM); 5 ♂♂, Bhutan, Pele La Pass, 27°33'N, 90°12'E, 17.VII.2009, 3279 m, leg. V. SINJAEV (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) 1: 498. Type locality: 'Germania'. Types: (not found).

***Odonestis pruni oberthueri* 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 Dochu La, 27°29'46 N 89°45'48"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, Taiwan (*rufescens* KARDAKOFF, 1928); southern China (Xizang, Sichuan, Yunnan), northern India, Nepal, Bhutan, north-eastern Myanmar, Vietnam (*oberthueri* TAMS, 1935).

***Argonestis flammans* (HAMPSON, 1892)**

Bharettia 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. FILCHER (BMNH); 1 ♂, Bhutan, Mongar, Thebong, 27°07'N, 91°20'E, 2273 m, 26.X.2009, YU. BEZVERKHOV & V. SINJAEV (CYBM).

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

***Kosala k a d o i* spec. nov. (col. pl. 1: 5)**

Holotype ♂, Bhutan (Central), 9 km E Wangdue, Phodrang Kichu Resort, 1300 m, 7.VIII.2005, leg. A. HAUENSTEIN & P. KAUTT (CAHU). Paratypes: 8 ♂♂, Bhutan (Central), 9 km E Wangdue, Phodrang Kichu Resort, 1300 m, 7.VIII.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°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. HAUENSTEIN & P. KAUTT (CAHU); 3 ♂♂, Bhutan, Dung Dung, Nobding, 27°32'N, 90°11'E, H~1970 m, 1.-3. VII.2009, leg. V. SINJAEV (CVSM); 5 ♂♂, 1 ♀, Bhutan, Pele La Pass, 27°33'N, 90°12'E, 29-30.VI.2009, H~3279 m, leg. V. SINJAEV (CVSM); 1 ♂, Bhutan (West), Jhomolhari Trek, Jangothang, base camp north side, 4150 m, 2.VIII.2005, leg. A. HAUENSTEIN & P. KAUTT (CAHU); 1 ♂, Bhutan (West), Jhomolhari Trek, Jangothang, base camp north side, 4150 m, 2.VIII.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.2003, leg. A. HAUENSTEIN & P. KAUTT (MWM); 1 ♂, Bhutan (West), Distr. Paro, 5 km N Paro, Do Chu valley, 2350 m, 24.VI.-6.VII.2003, leg. A. HAUENSTEIN & P. KAUTT (MWM); 3 ♂♂, Bhutan, Bumthang, 27°31'N, 90°33'E, 2420 m, 7.-9.VII.2009, V. SINJAEV (CVSM); 3 ♂♂, 1 ♀, Bhutan, Pele La Pass, 27°33'N, 90°12'E, 29.-30.VI.2009, 3279 m, leg. V. SINJAEV (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 medias, submarginal fascia irregularly dentate and outlined from brownish-grey outer field with narrow whitish shadow. Discal spot small yellowish. Hindwings without pattern. Sternum VIII weakly varies in general shape as figured but normally is with finely dentate caudal margin and rather distinct medio-caudal cut.

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 ferruginea* MOORE, 1872**

Proc. Zool. Soc. London 1872: 580, pl. 33: 8. Type locality: India, Darjeeling. Holotype ♂ (BMNH) [examined].

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 roepkei* 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

- DIERL, W. (1975): Ergebnisse der Bhutan-Expedition 1972 des Naturhistorischen Museums in Basel. Einige Familien der „bombycomorphen“ Lepidoptera. - Ent. Basiliensis 1: 119-134, Basel.
 DUDGEON, G. S. (1901): A Catalogue of the Heterocera of Sikkim and Bhutan. Part 9. - J. Bombay Nat. Hist. Soc. 13: 406-425, Calcutta.
 FLETCHER, T. B. (1925): Catalogue of Indian Insects Part 7 (Lasiocampidae): 1-29. - Calcutta: Gov. of India, Central publication branch.

HAMPSON, G. F. (1892 [1893]): The Fauna of British India, including Ceylon and Burma. Moths 1: 402-430. - London.

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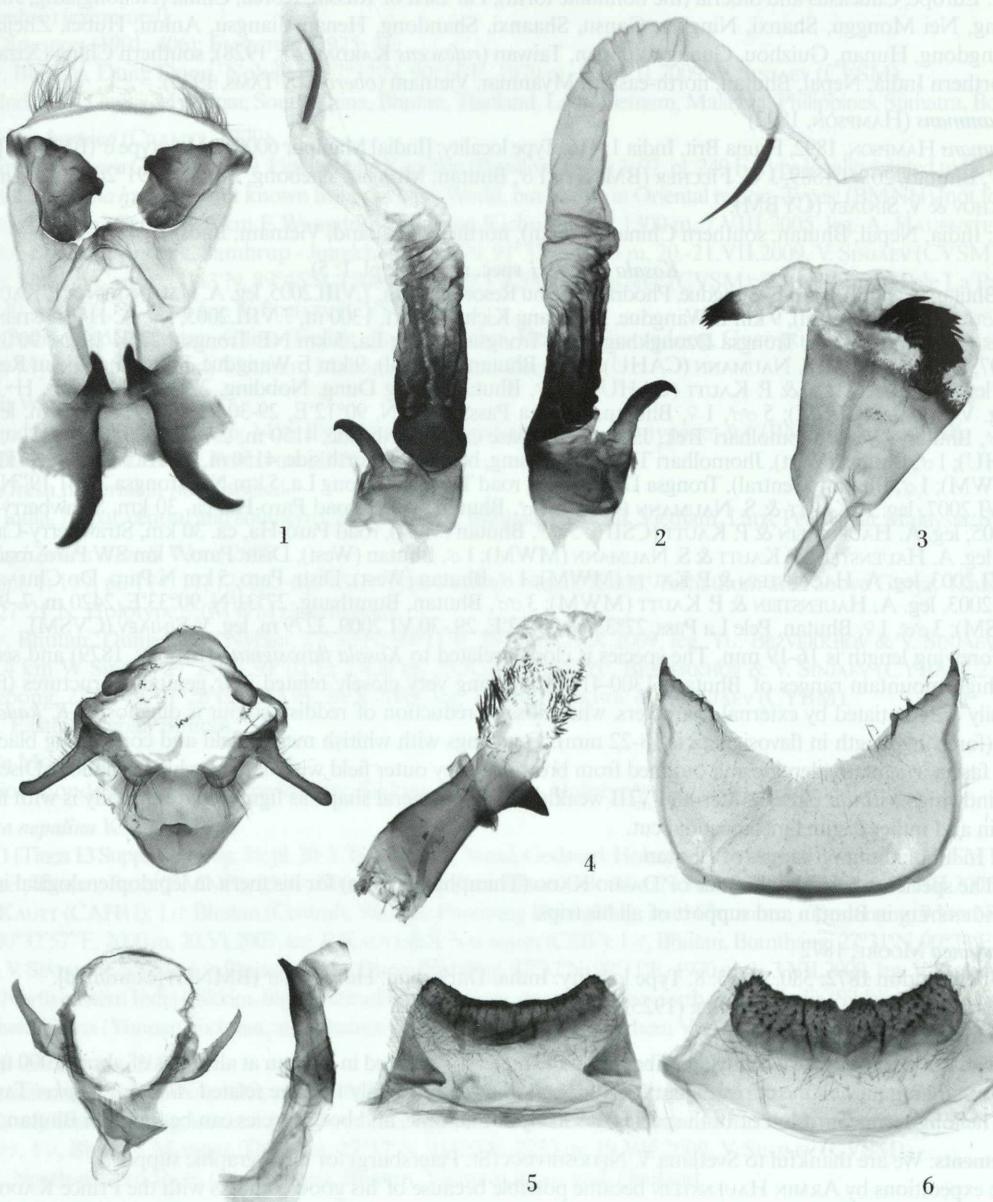
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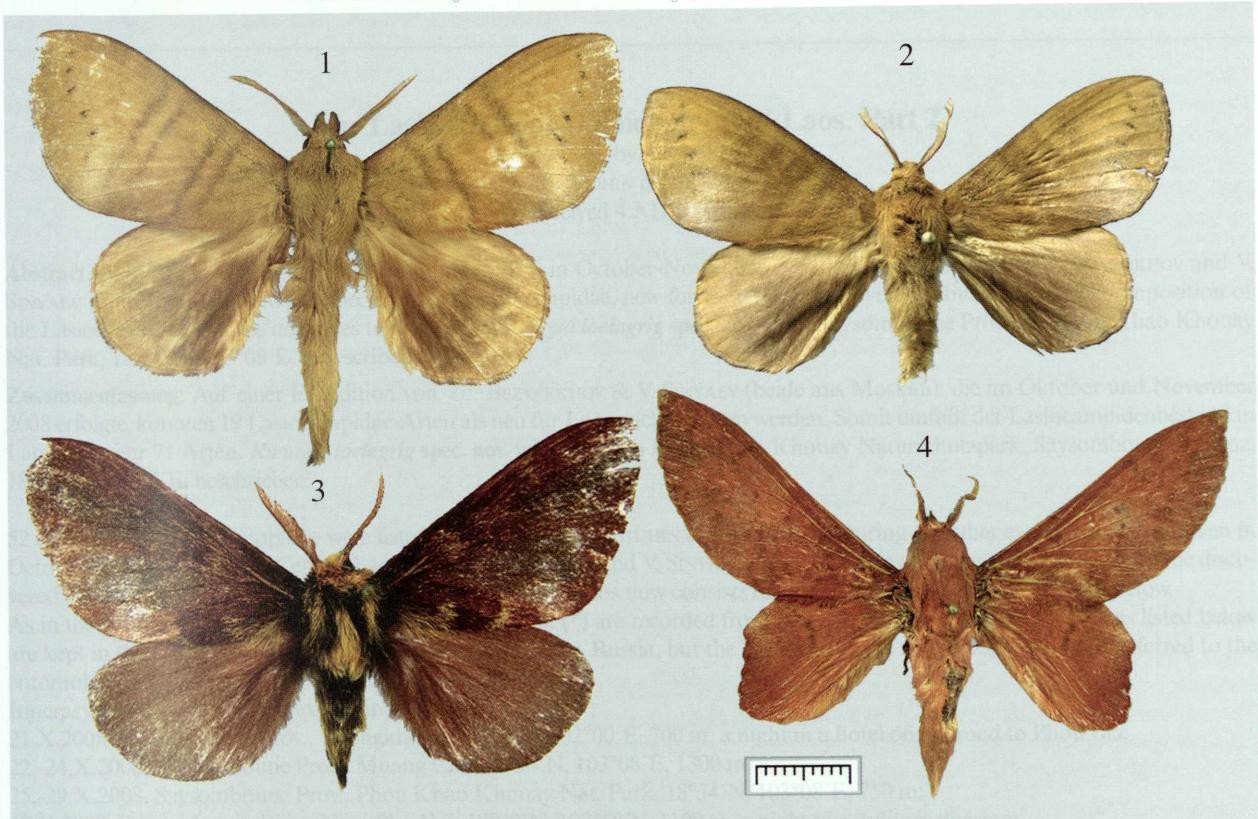
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1-6: ♂♂ genitalia of Bhutanese Lasiocampidae. (1-2) *Kunugia dzong* spec. nov.: (1) holotype (aedeagus extracted), (2) paratype, aedeagus with vesica fully inverted. (3) *Stenophylloides moorei* ZOLOTUHIN, 2005, aedeagus extracted, Bhutan (West), Thimpu Dzong-khang, Mo Chu-valley, 16 km NW Punakha, 1500 m, 11.VI.2007, leg. P. KAUTT & S. NAUMANN (CAHU). (4) *Amurilla subpurpurea dharma* subspec. 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 kado* spec. nov.: (5) paratype (aedeagus and sternum 8 separatum), 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.XI.2008, Xiangkhouang, Phou

2.XI.2008, Xiangkhouang, Ban

3.-4.XI.2008, Xiangkhouang, Ban

5.XI.2008, Xiangkhouang, Ban

6.XI.2008, Xiangkhouang, Ban

5.XI.2008, Xiangkhouang Prov.

The following abbreviations are used:

BMNH: The Natural History Museum, London

CMSW: Collection of MANFR, St. Gallen

MWM: Entomological Museum

NHML: Natural History Museum, London

ZFMK: Zoologisches Forschungsmuseum Alexander Koenig, Bonn

ZSM: Zoologische Staatssammlung, Munich

All material was collected by Yu Bevezin



A dendrochronal checklist of six species

**Euthrix fossa* (SWINHOR, 1879)

Odonestis fossa SWINHOR, 1879. Ann. Mag. Nat. Hist. 19: 410. Type locality: India, Jaitina Hills. Holotype ♂ (BMNH).

Euthrix fossa mariae ZOLOTUHIN, 2001

Atlas 32: 496, fig. 3, pl. 12: 5, 6. Type locality: Thailand, Chiang Mai, Doi Phahompok, 16 km NW of Fang, 2030 m. Holotype ♂ (MWM).

Material: 1 ♂, Xiangkhouang, Ban Na Sao, 19°30'N, 102°58'E, 5.XI.2008, 750 m.

Distribution: India (Jaintia Hills), Bhutan (sp. nov. Swinhor); northern Thailand and Laos (sp. mariae ZOLOTUHIN, 2001).

**Euthrix improvisa* (de LACEPOGNE, 1978)

Philodoria improvisa pt. LACMECAUSTIC, 1978, Ann. Soc. ent. France 14 (3): 290, pl. 1 Gr. 7. Type locality: northern Vietnam (Tachien-china, Tuyen Quang [Prov.]). Holotype ♂ (BMNH).

Material: 1 ♂, Xiangkhouang, Ban Na Sao, 19°30'N, 102°58'E, 5.XI.2008, 750 m.

Distribution: Southern China, northern Thailand, northern Vietnam, Laos.

Euthrix leucosticta (SWINHOR, 1879)

1: *Kunugia dzong* spec. nov., holotype ♂ (CSIF). Material: 1 ♂, Bhutan (West), Chhukha Dzongkhag, Chhukha, Chhukha, 6 km SE of Punakha, 1100 m. Holotype ♂ (CSIF).

2: *Kunugia loelagrig* spec. nov., holotype ♂ (see p. 38).

3: *Amurilla subpurpurea dhama* subsp. 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. HAUENSTEIN & P. KAUTT (MWM).

Scale bar 1 cm.

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