Notes on the identity of *Loepa katinka diversiocellata* BRYK, 1944 and description of a new species, with notes on preimaginal morphology and some taxonomic remarks on other species (Lepidoptera: Saturniidae)

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Abstract: On the basis of some expeditions by two of the authors (S.N., S.L.) and study of other recent collecting results from remote areas in N.E. Myanmar (= N.E. Burma) during the last years, a more detailed study of Saturniidae species from the Kachin State in northeastern Myanmar is now possible. The present paper deals with a survey of the Saturniidae taxa described by BRYK (1944) from the Swedish R. MALASE expedition to Kambaiti, Burma. In a first part (1), the current taxonomic status of his taxa is presented in an annotated list, supplemented by additional saturniid species now known from the N.E. Kachin State. In further parts, two of BRYK’s taxa are specifically dealt with here: 2) *L. diversiocellata* BRYK, 1944 is found to be a new synonym of *Loepa katinka* (WESTWOOD, 1847), syn. n., based on type studies. Thereby the species which was misidentified as *L. diversiocellata* in recent literature for nearly 20 years due to a misidentification of BRYK’s type of *L. katinka diversiocellata* has no available name. This species, widely distributed on the southeastern Asian continent, is, therefore, described as *Loepa diffundata* sp. n. The type series of the new species is restricted to specimens from Laos only. Male holotype and female paratype (allotype) will be donated to the Museum für Naturkunde in Berlin. Larval morphology of the new species is illustrated in colour. 3) *Antheraea mezops* BRYK, 1944 turned out during type studies to be a junior synonym of *A. castanea* JORDAN, 1910, syn. n. A male lectotype for *A. castanea* JORDAN, 1910, in BMNH, London, is designated.

Bemerkungen zu *Loepa katinka diversiocellata* BRYK, 1944, mit Beschreibung einer neuen Art sowie weiteren Bemerkungen zu Präimaginalstadien und zur Taxonomie anderer Arten (Lepidoptera: Saturniidae)


Introduction

For a long time the access to remote parts of the Union of Myanmar (= Burma) was nearly impossible, and almost no material was available for studies aside those older specimens achieved during colonial times by British museum collectors and the famous results of an expedition by the Swedish René MALASE in 1934 which today are deposited mainly in the Swedish Museum of Natural History (formerly Naturhistoriska Riksmuseet), Stockholm; only a few specimens of the original material are found in MAKB and LNK (NÄSSIG & ÖBERPRIEFLER 1994: 370).

During recent years Burma opened a little, and several specimens collected during expeditions to Kachin State, the northeastern parts of the country, were accumulated by the senior author. They resulted from collecting efforts by Viktor SINJAEV (Moscow), Yasuyuki WATANABE (Amagasaki-shi) and some local collectors, and the material redirected our interest to this hardly accessible area. In June 2006 a first expedition was carried out by S. LÖFFLER, Michael LANGER and S. NAUMANN to places near and north of Kambaiti, the type locality of several Saturniidae taxa described by BRYK (1944). At that time, a new connecting road between N.E. Myanmar and the Chinese province of Yunnan was under construction and the pass via Kambaiti inaccessible. The visit of the northeastern Kachin State just along the Chinese border turned out to be strenuous and dangerous because of very bad weather conditions, military activity and almost no functioning public transport and communication systems.

During the 2006 expedition, all Saturniidae taxa described by BRYK (1944) were found again at almost topotypical places, except *Sinobirma malaisei* (BRYK, 1944) which, however, was received already earlier in 1998 from an

expedition by V. Sinjaev to the Putao area, and from local collectors in a small series from the Myanmar–China borderline a little north of Kambaiti collected in 2007.

Material and methods

Material lists used for this study see below under the taxa dealt with. Morphological studies followed standard procedures.

Acronyms used

BMNH The Natural History Museum, London, U.K. [formerly British Museum (Natural History)].
CAHS Collection Armin HAUENSTEIN, Schönenberg, Germany.
CBH Collection Ulrich BROSCH, Hille, Germany.
CSLL Collection Swen LÖFFLER, Lichtenstein, Germany.
CSNB Collection Stefan NAUMANN, Berlin, Germany.
CTKI Collection Teemu KLEMETTI, Imatra, Finland.
CWAN Collection Wolfgang A. NÄSSIG, now in SMFL.
EMEM Collection Entomologisches Museum U. ERTSCHBERGER, Marktleuthen; now in part privately sold, in part in ZSM.
LNK Staatliches Museum für Naturkunde Karlsruhe (formerly Landessammlungen für Naturkunde, Karlsruhe), Germany.
MAKB Museum Alexander Koenig, Bonn, Germany.
MHNL Muséum d'Histoire naturelle de Lyon, France.
MNHU Museum für Naturkunde der Humboldt-Universität zu Berlin, Germany.
NRMS Swedish Museum of Natural History (formerly Naturhistoriska Riksmuseet), Stockholm, Sweden.
OUM Oxford University Museum, Oxford, U.K.
SMFL Senckenberg-Museum, Lepidoptera collection, Frankfurt am Main, Germany.
SMTD Staatliches Museum für Tierkunde, Dresden, Germany.
ZMA Zoölogisch Museum Amsterdam, Afdeling Entomologie, Amsterdam, The Netherlands.
ZSM Zoologische Staatssammlungen, München (Munich), Germany.

Other abbreviations used

AT "Allotype" (= a specifically marked paratype of the other sex as compared to the HT).
Fw. Forewing.
Fwl. Forewing length (measured in a straight line from the wing base to the most distant point of the apex; see Text-Fig. 1).
GP Genitalia preparation (dissection no.).
HT Holotype.
Hw. Hindwing.
Hwl. Hindwing length (measured in a straight line from the wing base to the point where vein Cu 1 reaches the outer wing margin, i.e., measured across the outer anal rim of the hw. ocellus; see Text-Fig. 1).
LT Lectotype.
PLT[s] Paralectotype[s].
PT[s] Paratype[s].
ST[s] Syntype[s].

1) Results — Saturniidae of the N.E. Kachin State: an updated review

Most taxa were described by BRYK (1944) at subspecific or even infrasubspecific rank. The present access to small series of new material is very helpful for taxonomic work, because several of the taxa involved were later raised to species rank by other authors, in part obviously without checking the identity of the original material and the potential synonymies. Now the new material much easier allows a proper interpretation of the taxa.

The following list of species follows the names described or listed by BRYK (1944). The taxa are here cited in the original combination of BRYK, and the actual status is mentioned in square brackets []:

- Actias selene malaisei BRYK, 1944 [no changes since 1944].
- Cricula andrejordani BRYK, 1944 [Cricula jordani: NÄSSIG (1989a: 182)].
- Antheraea assamensis mezops BRYK, 1944 [Antheraea (Antheraeopsis) mezops: U. PAUKSTADT et al. (1999: 450); but see below].
- Loepa katinka diversiocellata BRYK, 1944 [Loepa diver-
• *Salassa lola katschinica* Bryk, 1944 [*Salassa katschinika* sic, misspelling: Witt & Pugaev (2007: 1)].

• *Salassa mesosa excellens* Bryk, 1944 [no changes since 1944; Brechlin (1997: 79) cites the taxon with unclear status: “(mesosa ssp.? excellens)”].

• *Salassa mesosa f. melanops* Bryk, 1944 [infra-subspecific; no changes since 1944].

• *Opodiphthera* (*Sinobirma*) *malaisei* Bryk, 1944 [this species is not even distantly related to the genus *Opodiphthera* Wallengren, 1858; the subgenus was raised to a separate genus: *Sinobirma malaisei*, and transferred into the otherwise African tribe Pseudaphelini, now Urotini (see Oberprieler 1997): Nässig & Oberprieler (1994: 369)].

• *Rinaca zuleika* malaisei Bryk, 1944 [*Saturnia* (*Rinaca*) zuleika: Nässig (1995: 257), with synonym *malaisei*].

• *Caligula anna diversa* Bryk, 1944 [no changes since 1944; *diversa* was not specifically mentioned in Nässig (1995), but the genus *Caligula* Moore, 1862 (type species *Saturnia simla* Westwood, 1847) is listed there as a junior subjective synonym of *Rinaca Walker, 1855* (type species *Saturnia zuleika* Hope, 1843) and was as such integrated as a subgenus into *Saturnia* von Paula Schrank, 1802; further revisional notes are in preparation].

• *Samia canningi* (Hutton, 1859), as mentioned by Bryk (1944: 3), turned out to be a mixed series; 1 of Bryk’s 3 specimens was in fact *S. kohli* Naumann & Peigler, 2001, only the other 2 specimens were true *S. canningi* (Peigler & Naumann 2003: 112 & 131, 133).

In addition to the taxa listed above and already mentioned by Bryk (1944), the following further Saturniidae species can be recorded from N.E. Kachin State so far:

• *Attacus atlas* (Linnaeus, 1758). This species was collected in the environments of Putao at an altitude of 800 m which probably is near the upper limits of its altitudinal range in N.E. Burma. In several other states of Myanmar it was recorded at lower elevations only.

• *Archaeoattacus edwardsii* (White, 1859). While *A. atlas* is recorded from lower altitudes only, *Arch. edwardsii* is more a representative of medium to high altitudes. It was recorded in Kachin State at altitudes from 800–1250 m, which is probably near the lower limits of its altitudinal range, judging from other records in Myanmar and outside that country.

• *Actias dubernardi* (Obrechtør, 1897). This first record for Myanmar of this species described from China see in Naumann (2006: 9).

• *Actias winbrechlini* Brechlin, 2007. Specimens of this species were collected in May 2006 by Löffler, Langer & Naumann at 3000 m altitude near the Chinese border-line, and there are further specimens in the senior author’s collection collected between 2660 and 2800 m from the Chudu Razi range situated a little further north. Regrettably this material was not considered as type material or listed otherwise by Brechlin although it was known to him at the time of description (2007: 17, 19).

• *Actias sinensis* Walker, 1855. Specimens are somehow larger in comparison to material from mainland China, but genitalia structures showed no significant differences.

• *Antheraea (Antheraea)* *friithi* friithi Moore, 1859.

• *Antheraea (Antheraea)* *royilli* royilli Moore, 1859.

• *Antheraea (Antheraea)* *helferi* helferi Moore, 1859.

• *Antheraea (Antheraea)* *assamensis* (Helfer, 1837). While “*A. assamensis mezops*” as mentioned above is a typical representative of higher altitudes (compare also U. Paukstadt et al. 1998: 452, and see below), the true *A. assamensis* is a lowland species, collected at altitudes from 235 to 800 m in N.E. Myanmar.

• *Cricula subulata* Nässig, 1985. Records from N.E. Myanmar and Tibet in the senior author’s collection widen the known range of the species further to the West. Previously it was known only from Yunnan province in China.

• *Loepa miranda* Atkinson in Moore, 1865. A fullgrown larva was found in N.E. Kachin State of Burma by the senior author; it showed no differences to those known from N. Thailand (photos seen by the senior author) or those figured by Nässig & Ragus (2001) from North India.

• *Lemairea luteoepilus* Nässig & Holloway, 1988. An association of the material to one of the described subspecies cannot presently be made with certainty. Further material recently received from different provinces of Burma, Laos, and China may allow a new arrangement of the taxa involved in future.

• *Saturnia bieti* Oberthür, 1886.

• *Saturnia centralis* Naumann & Löffler, 2005.

• *Saturnia cachara* (Moore, 1872).

• *Saturnia simla* Westwood, 1847.

• *Salassa megasctica* Swinhoe, 1894. This species can be determined easily by its generally large size, the relatively large greenish-transparent spot of the forewing and the large hindwing eye-spots in vivid orange followed by greyish white (compare also the notes in the original description).

Taxonomic notes on some other of Bryk’s taxa will follow in future papers from time to time, but two taxa are dealt with here in more detail: *Loepa katinka diversiocellata* and *Antheraea assamensis mezops*.

A publication (Racheli 2008) received just before print of the present work deals with a similar subject, listing recent new information on saturniid species from northern Myanmar; however, Racheli’s paper contains fewer species, some errors, and we do not agree with his conclusions regarding *Loepa diversiocellata*, which, with respect to its genitalia morphology, apparently does not belong to the sikkima-group as he states. This publication came so late in our hands that we were not able to deal with it in more detail.
2) The taxonomy of Loepa katinka diversiocellata

Without having assessed the identity of Bryk's type material of Loepa katinka diversiocellata, this taxon was raised to species level by Pinratana & Lampe (1990: 22). If they had compared the types of Bryk's taxon with their Thailand material of Loepa, they would probably have noticed that L. diversiocellata sensu Pinratana & Lampe is different from Bryk's material, and Bryk was correct when he classified his taxon as a subspecies of L. katinka (Westwood, 1847).

The idea to use diversiocellata as the name for this large Thai species in Pinratana & Lampe (1990) was in part based on discussions about its identity between R. E. J. Lampe, J. D. Holloway, W. A. Nässig and others in the late 1980ies (see, e.g., Nässig & Treadaway 1988: 171), but the “Moths of Thailand” volume 1 was published before anyone looked at Bryk's original types and before there was a final mutual decision on this subject. And after this interpretation of the name was published, all specialists were content with the published version for the time being and used it in other publications (e.g., Nässig et al. 1996a).

Bryk's holotype data for Loepa katinka diversiocellata are: N.E. Burma, Cambaiti, 2000 m, 12.–17. VI. [19]34, Malaise; RM prep 7174 [yellowish cardboard]. The holotype specimen (♂) plus its genitalia are figured here in colour for comparison (Figs. 4a, 4b, 21).

L. katinka was described by Westwood (1847) after an indetermined number of specimens (= syntypes) from Assam and Sylhet (from the number of collections cited by Westwood there must have been at least 3 syntype specimens, possibly more), and Swinhoe (1892: 247) designated a ♀ from Assam out of that series as lectotype (see Nässig 2007). At least 2 of Westwood's specimens are still preserved in the collections of the Oxford University Museum, and the ♀ lectotype which comes very close to Westwood's figure is shown on a photo here for the first time (Figs. 3a, 3b). It has the following labels: “type Lep. No. 1984 Saturnia katinka Westwood, Hope Dept. Oxford — A. Westwood's type of Saturnia katinka, Cab. pl. 12 — Saturnia Katinka Westw., Cab. Orient. Ent. 87 [handwritten, Westwood] — Assam [handwritten] — Hope Ent. Coll. Oxf. Univ. Mus. genitalia no. 1987: 1376 — 1155”. It has a fwL of 46 mm. The second preserved specimen in OUM is a ♀ paratype which has the following labels: “B — 1155 — Ashmol. Mus.” [= Ashmolean Museum; quite illegible, blue]. It also has a fwL of 46 mm.

As mentioned by Nässig (2007: 176), Kirby (1892: 935) validly designated L. katinka as type species of the genus Loepa Moore, 1859 by indicating this species with an asterisk as explained in his foreword (Kirby 1892: vi). The publication containing the first description of Loepa was not the one by Horsfield & Moore (1860 [*1858–1859]*) as mentioned by Fletcher & Nye (1982: 92), but the work by Moore (1859) which was published earlier due to delays in publication of the Horsfield & Moore monography. This work of 1859 did not contain a valid designation of a type species and, because there were more than one species included, there was no type species by monotypy either, and therefore Kirby's designation is valid and necessary. A review of the taxonomy was published by Nässig (2007).

Roepke (1953) provided a review of the names in the genus Loepa published at that time. He was not sure about the correct classification of L. katinka diversiocellata and proposed that it could be related to L. megacore Jordan, 1911 (an opinion which had some impact on the discussion about the identity of the taxon diversiocellata in the 1980ies). As shown by Nässig & Suhardjono (1989: 209) all taxa cited in Roepke's paper as “katinka” from the Greater Sunda Islands were misidentified by him and are either L. megacore, L. sikkima javanica Mell, 1950, L. cynopsis Nässig & Suhardjono, 1989, or L. sumatranana Nässig, Lampe & Kager, 1989. The larval instars described earlier by Roepke (1918) from Java and referred by him to L. katinka most likely belong to L. sikkima javanica. The larvae of the different species are generally quite similar and often do not allow an easy and safe identification from pictures, especially without sufficient reference material (photos) to compare with.

It can be seen from the locality data (see list below) that L. katinka is a solely Himalayan species which ranges from Western India via Nepal, Tibet and Myanmar to the western parts of the Chinese province of Yunnan; a specimen with genitalia like true katinka, but slightly different external habit is known from Guangdong Province and marked with a question mark in the map. Records from N.E. Pakistan are lacking so far, but the species might perhaps be expected to locally occur there as well. L. katinka is a medium-sized species which, as already noted by D'Abreira (1998: 46), is slightly larger on average, with a more triangular fw. shape than L. sikkima Moore, 1865 (which usually has a more rounded fw. shape) but has in general smaller ocelli on its wings in proportion to its size; in addition to this, the ♀ genitalia of L. katinka show no prominent separate process above the pollex (see below in the description for details) partly closing the otherwise wide U-shaped gap of L. sikkima and a different vesica with a more hump-like cornutus and a field or partial ring of small selerites instead of a distinct single spine.

The following is a list of data of Loepa katinka specimens comprising material cited in recent literature (Allen 1993, Arora & Gupta 1979, Bryk 1944, D'Abreira 1998, Haruta 1992, 1994, Smith 2001) and from some museum and private collections (acronyms see list above); see Map 1.

Specimens from different places in India (Assam: Khasi Hills, Shillong; Arunachal Pradesh; Figs. 6, 9), Myanmar (Kachin State, toptype of L. k. diversiocellata, and Chin State; Figs. 5, 8) and China: Tibet (Fig. 7), the LT of L. katinka (Figs. 3a, 3b), the HT of L. katinka diversiocellata (Figs. 4a, 4b) and ♀ genitalia of specimens from Western India (Fig. 22) and of the HT of L. katinka diver-
siocellata (Fig. 21) are figured here. While specimens of *L. katinka* captured in the wild always show very intensively coloured and pointed black lines, often somewhat blurred, and sometimes really large ocelli, all reared specimens (which are mostly available from the northern Indian subcontinent) show a more bright yellow colour with less intensive markings, no blurring, and on average smaller ocelli.

**Records of *Loepa katinka*,** specimens used for comparison


**Bhutan:** several reared specimens from trader’s import, CWAN.


**Map 1:** Distribution range of *L. katinka* (▲) and *L. diffundata* sp. n. (●) based on the specimens studied and the literature references cited. One symbol may include more than one locality closely together. The easternmost locality (from Guangdong Province in China) corresponds to a specimen which appears to be *L. katinka* from the ♂ genitalia, but needs further study (= question mark). — Map from Online Map Creation Dr. Martin Weinelt, www.aquarius.ifm-geomar.de, modified and supplemented.
Colour Plate 1, Figs. 1–10: Loepa specimens. Fig. 1: Loepa diffundata sp. n., ♂ HT (CSNB > MNHU); Fig. 1a: dorsal view; Fig. 1b: ventral view. Fig. 2: L. diffundata sp. n., ♀ PT (AT) (CSNB > MNHU), dorsal view. Fig. 3: L. katinka katinka, ♂ LT (OUM); Fig. 3a: dorsal view; Fig. 3b: ventral view. Fig. 4: L. katinka diversiocellata, ♂ HT (NRMS); Fig. 4a: dorsal view; Fig. 4b: ventral view. Fig. 5: L. katinka, ♂ topotype of L. katinka diversiocellata, Kachin State, Myanmar (CSNB). Fig. 6: L. katinka, almost topotype of L. katinka katinka, India, Assam, Khasi Hills, Shillong (CSNB). Fig. 7: L. katinka, ♂, Tibet, Yigong, 2100 m (CSNB). Fig. 8: L. katinka, ♂, Myanmar, Chin State (CSNB). Fig. 9: L. katinka, ♂, India, Arunachal Pradesh (CSNB). Fig. 10: L. diffundata, aberrant melanistic specimen, Bhutan, Mongar Dzongkhag (CSNB). — Specimens not to the same scale; scale bars 1 cm. — Photos S.N., except Fig. 4 (B. Gustafsson, NRMS).

Colour plate 2, Figs. 11–16: larvae of Loepa diffundata sp. n.; Figs. 11–15: Bhutan, Fig. 16: N. Thailand. Fig. 11: L₁ (arrow, partly covered by L₂ larvae) and L₃. Fig. 12: L₁ in moult to L₂. Fig. 13: L₂. Fig. 14: L₃. Fig. 15: L₄ details. Fig. 16: L₅. — Photos and rearing (on Parthenocissus sp., Vitaceae) S.N.
No constant differences in the ♂ genitalia and in general external appearance of Himalayan *L. katinka katinka* from India (and other populations of *L. katinka*) on one side and *L. katinka diversiocellata* from Kachin State on the other side were found. Therefore, we herewith interpret *L. katinka diversiocellata* syn. n. as a junior subjective synonym of its nominotypical subspecies *L. k. katinka*, thereby restricting *L. katinka* to a monotypic species again (for Mell’s so-called Chinese subspecies *L. k. k.*). Therefore this species is described herewith as new:

**Loepa diffundata sp. n.**

**Holotype ♂** (Figs. 1a, 1b): Laos, Ban Hin Ngon, ca. 15 km SW Xam Nua, 1000 m, 11.–20. ix. 2002, leg. T. Ihle, via Sven Löfler, GP 1525/06 Naumann, ex CSNB, will be deposited in MNHU. — A red HT label will be fixed accordingly.

**Paratypes** (in total 82 ♂♂, 10 ♀♀), all from Laos: 1 ♀ (Fig. 2) (allootype), (N), 100 km E Luang Prabang, military camp env. near Central Route, 1400–1600 m, 20. ix.–10. x. 1997, leg. M. Steinken, via S. Steinke/H. Lehm. via U. Brosch, ex CSNB, will be deposited in MNHU. A red AT label will be fixed accordingly.

**Derivatio nominis:** The name *diffundata* is a form of the Latin verb *diffundere* meaning “being [widely] distributed”, and it is grammatically a ♂ adjectival form; however, the name is herewith defined to be a substantive in apposition. The new species is named after its wide distribution across a large portion of continental Indochina (see Map).

**Further material** of the new species examined or cited in literature, but not included into the type series which remains to Laos:

**Nepal:** 1 ♂, Godavari 1550 m, vii. (Allen 1993: 61); 1 ♂, Godavari, 1550 m, 7. v. 1990, leg. M. Allen, CWAN (GP 667/91 Nässig).


Colour plate 3, Figs. 17–19: Antheraea (Antheraeopsis) specimens. Fig. 17: A. castanea, ♂ ST (BMNH, phot. V. Zolotuhin); Fig. 17a: dorsal view; Fig. 17b: ventral view. Fig. 18: A. castanea ♂, Myanmar, Kachin State, toptype of A. mezops (CSNB); Fig. 18a: dorsal view; Fig. 18b: ventral view. Fig. 19: A. castanea ♀, Myanmar, Kachin State (CSNB), dorsal view. — Specimens not to the same scale, scalebar 1 cm. — Figs. 20–24: ♂ genitalia. Fig. 20: L. diffundata HT, GP 1525/06 NAUMANN. Fig. 21: L. katinka diversicellata HT, GP RM 7174 (scale bar not “50 μm” as indicated in error, but approx. 2 mm). Fig. 22: L. katinka, India, Bhimtal, GP 1450/06 NAUMANN. Fig. 23: L. diffundata, Myanmar, Kachin State, GP 1526/06 NAUMANN. Fig. 24: A. castanea, ♂ ST, GP BM-Sat. 706 (phot. V. Zolotuhin). — Figs. not to the same scale, scale bar 1 mm, except in Fig. 21. — All photos S.N., except where indicated otherwise.

Description

♂ (Figs. 1a, 1b, 10). In general, L. diffundata is a medium to large sized Loepa species. Ground colour bright yellow, antennae ochreous brown, 9.5–11.0 mm long, with around 29 segments, up to the last 3 segments quadripectinate, length of rami 1.4 mm at maximum. Labial palpi yellow, collar, prothorax and proximal half of costa greyish. Tibiae and tarsi pinkish grey, rest of thorax and abdomen in ground colour with a dorsal and lateral row leg. Li & Tu, CSNB; 4 ♂♂, (S), 30 km N Lanchang, Hei Mt., 2400 m, 20.–30. VIII. 1999, leg. Wang & Li, CSNB; 4 ♂♂, (S), Dongling forest area, ca. 20 km W Changyuan, 2500 m, IX. 1999, leg. Wang & Li, CSNB; 1 ♀, (S), central-north Changyuan near border of Dima county, Guokandashan Mts., 2000–2300 m, IX. 1999, leg. Wang & Li, CSNB; 1 ♂, Yunlong county northern border, N Baoshan, Daorenshan Mts., 2800–3200 m, IX. 1999, leg. Wang & Li, CSNB; 1 ♀, Mengla, 21°27’N, 101°34’E, 900 m, 1–23. IV. 2006, leg. local collector, via V. Sinjave, CSNB; 2 ♂♂, (E), Honghe, Wulaofeng, 2500 m, VIII. 2003, leg. Li et al., CSNB. — Guangxi: 3 ♂♂, (W), Laogognshan, Mt. Xiling, 1800 m, VI. 2002, leg. Li, CSLL.
of grey patches. Fwl. 48–62 mm (HT 56 mm, average 55.5 mm, n = 111), hwl. 33–39 mm (HT 37 mm, average 36.0 mm, n = 84, largest specimens from Bhutan and India, smallest specimens from Vietnam and Yunnan. Typical markings of the fw. are the light pink median line which becomes darker to its outer margin and ends bordered with black at its costal part; the almost round or slightly oval fw. ocellus with 7.5–10.0 mm maximum diameter; the black median zigzag band and two bluish postmedian zigzag bands ending in the black and pink apical area; and a dark yellow row of patches with white halfmoon structures on the outer margin, all this on yellow ground colour. Hw. antemedian line is almost black, only the marginal 5–7 mm are of dark to lighter pink diameter. Rest of ornamentation similar to the fw., but the inner postmedian zigzag band ending broad pinkish-violet at the anal angle. The ventral side in inner parts a little lighter yellow, outside postmedian lines the same colour as on dorsal side. Ornamentation is similar, with few differences: The antemedian band of the fw. is only black, and both fw. and hw. ocellus are smaller, the outer dorsal portion less developed.

An aberrant, partly melanistic ♂ specimen was collected in eastern Bhutan by the senior author among a series of normally coloured specimens (Fig. 10). Other melanistic specimens are known in the genus *Loepa* only from some part of the Himalayan specimens of *L. sikkima* (a regularly appearing form only in some part of the Himalayan distribution range of *L. sikkima*, where it can sometimes reach more than 50% of the population, not found elsewhere), and regularly in all specimens of *L. obscuromarginata* Näumann, 1998 (a member of the distantly related miranda-species-group of the genus *Loepa*, see Yen et al. 2000).

♀ (Fig. 2). Similar to the ♂♂, but ♀♀ show typical sexual dimorphism, such as larger size (fwl. 56–75 mm, AT 75 mm, average 61.0 mm, n = 8; hwl. 36–45 mm, AT 45 mm, average 41.5 mm, n = 8), more rounded wing shape and details of antennae (length 10.5–11.0 mm, bipectinate).

♂ genitalia (Figs. 20, 23). Just like the moths themselves, also their genitalia are always larger than in *L. katinka*; the ♂ genitalia of *L. katinka* have only about ¼ of the overall size of *L. diffundata*, expressed in all dimensions: length of uncus, saccus and phallus, basal width of saccus, length and width of valves, etc. This difference in size is one of the main and most important differences between the species; the differences in morphology (shapes and size relations between parts) are to some degree variable, and not every single specimen exhibits all of them clearly (for example, the HT of *L. katinka diversiocellata* does not clearly express all characters of *L. katinka*, but, in contrast, in some rather resembles *L. diffundata*, see Fig. 21). So a safe determination always requires either a direct comparison of ♂ genitalia of both species or exact measurements of the sizes and good scales in the illustrations.

In the size and in some of the morphological characters of the ♂ genitalia, *L. diffundata* resembles the parapatric southern (Sundanian) species *L. megacore* (northern Sundaland) and *L. cynopis* (Java, Bali), and these 3 species (and some more of the SE Asian insular *Loepa* species) appear to form a small, possibly monophyletic species-group of large species.

Uncus of the new species bifid for the most distal part of its length, on average over a slightly shorter proportion than in *L. katinka*. Valves in the typical form of the genus, with the saccus prolonged into a long finger-like pollex, above which there is a large, more or less U-shaped indentation before thedistoapical part of the valves (the costal part) begins. (In contrast to *L. sikkima*, where this indentation is reduced in width by a slightly sclerotised prolongation of the saccus above the much shorter finger-like pollex which reduces the opening between pollex and apical lobe to a nearly ¾–closed circle, and in contrast to *L. katinka*, where the pollex is shorter.) The costal lobe of the valves in *L. diffundata* is soft, often covered with some hairs, and shows a shape which is tapering slowly to the round tip (in contrast to Himalayan *L. katinka*, where the apical costal lobe usually is rounded in a more quadrangular shape); this shape of the costal lobe of *L. diffundata* somehow recalls similar shapes in *L. megacore* and *L. cynopis* and a few other southern insular species. Saccus long and basally often relatively broad, juxta with 2 short lateral sclerotisations.

Phallus of *L. diffundata* long (ca. 7–8 mm long) and broader, always longer than in e.g. *L. katinka* or *L. sikkima* (ca. 4–5.5 mm long and narrower in *L. katinka*, maybe even slightly smaller in *L. sikkima*). The cornuti are quite variable in the species, but in *L. diffundata* the vesica shows on the dorsal side slightly to the right only 1 basally weakly sclerotised, but usually broad cornutus, laterally on the right and left side of the distal end of the sclerotised tube of the phallus a variable small field of little sclerites. In *L. katinka*: usually 2 variable, usually small sclerotised areas (not always real cornuti, sometimes just humps) to the right and left side (often just patchy or short partial ring-like on the vesica). The shape of the distal end of the sclerotised tube of the phallus is also somehow different between the species, but very variable.

Preimaginal instars (Figs. 11–16). The new species was reared several times, unfortunately not from Laos so far, but, e.g., by the senior author from Northern Thailand and Bhutan. Eggs are of chestnut brown colour and have a regular ovoid shape. The larvae show the typical *Loepa* pattern with dead leaf mimesis from 3rd instar on (see Nässig & Treadaway 1988: 171–172, Nässig et al. 1996b). Foodplants used in captivity were members of Vitaceae, as generally known for the genus; leaves of *Parthenocissus* sp. were easily accepted. We figure all 5 instars of the larvae from Bhutan reared in 2007, and a fullgrown L. larva from Doi Pha Hom Pok, northern Thailand, reared in late 2006.
Discussion

Confusion about the identity of *L. katinka* on one side and other species (including *L. diffundata*) on the other side in literature started already with the original description of the genus in which Horsfield & Moore (1860 [“1858–1859”]) included Javanese specimens, although *L. katinka* was described from Himalayan regions only. At that time all authors evidently regarded all *Loepa* specimens to belong to a single, variable species; genitalia were not checked then. The same happened in the valid generic description by Moore (1859), which was even based on taxa of different genera (see Nässig 2007: 176). As we know today, *L. katinka* is a typical Himalayan faunal element which occurs only at medium to high altitudes; it easily can be separated from the only similar sympatric Himalayan species, *L. sikkima*, by the smaller ocelli, more intensive markings (in wild collected specimens), differences in genitalia, especially the different valve structure of the $\delta \delta$ (see above), and by its behaviour: $\delta \delta$ showed a flight activity at artificial lights from around 19.30 to 22.30 h, while those of *L. sikkima* arrived at lights in early morning hours; and *L. sikkima* in general is a representative of lower altitudes.

*L. diffundata* was correctly identified as a species different from *L. katinka* by Pinratana & Lampe (1990), but the authors unfortunately used the wrong name for it. Several authors followed that misidentification (e.g., Allen 1993: 61, Nässig 1994b: 349, Naumann 1995: 82, Nässig et al. 1996a: 68, 1996b: 137 ff., d’Abrera 1998: 48, 49, Nässig & Treadaway 1998: 395, Brosch et al. 1999: 46, Smith 2001: 40). *L. diffundata* easily can be separated from *L. katinka* by its larger size, smaller ocelli, more reduced dark ornamentation, and larger $\delta$ genitalia. It generally flies at lower altitudes than *L. katinka*, and $\delta \delta$ were found to have an activity peak in the wild at light from around 1:30–4:00 h in the morning (at least when these data were reported at all); however, specimens of *L. katinka* and *L. diffundata* may sometimes be collected at the same place in the same night at light (see material lists). Differences to *L. katinka* were already well described by Pinratana & Lampe (1990). *L. diffundata* externally resembles (caused by its larger size and less colourful wing markings) much more the big Sundanian species *L. megacore* or especially *L. cynopsis* and other insular taxa rather than *L. katinka*. In contrast, *L. sumatrana* from the mountains of Sumatra externally appears to be much more a “nearly identical twin” of *L. katinka*, although its genitalia are distinct.

3) On *Antheraea* (*Antheraeopsis*) *mezops*

Interest turned to *A. mezops* Bryk more than a decade ago when lots of material from Mt. Fan Si Pan of Northern Vietnam came into the hands of German entomologists. Because most of the types of taxa associated with the subgenus *Antheraeopsis* Wood-Mason, 1886 were unknown to those dealing with the material at that time, Vietnamese specimens were first believed to represent an unnamed taxon (Paukstadt & Paukstadt 1998: 7, cited again with the same status in U. Paukstadt et al. 1998: 319). Later, however, when photos of Bryk’s type specimens became available, they were referred to *A. mezops* (U. Paukstadt et al. 1999: 451), and the taxon *mezops* was raised to species rank due to genitalia differences to other species.

During the last about 20 years several *Antheraea* taxa were combined and synonymized in different ways, obviously always without proper studies of type specimens before. Holloway (1987: 101) synonymized several taxa including *A. assamensis mezops* with *A. assamensis*. Similar was the handling of another taxon, *A. castanea* Jordan, 1910: Although known that it was described from N.E. India, populations of the subgenus *Antheraeopsis* mentioned as *A. assamensis* by Pinratana & Lampe (1990) for Thailand (following Holloway) as well as those from Sundaland were referred to *A. castanea* by Nässig et al. (1996a & b), for the Sundanian part as subspecies youngi Watson, 1915. Also for the Laotian fauna specimens were tentatively listed under *A. castanea* by Brosch et al. (1999: 44), always noting that the type material was not checked and a final determination would follow in a then planned revision; in fact, today we would prefer to place them with *A. assamensis* or a near relative. *Antheraea* (*Antheraeopsis*) youngi Watson, 1915 was interpreted as a separate Sundanian species already by Nässig & Treadaway (1998: 288), U. Paukstadt et al. (2000: 23) as well as most recently by Beck & Nässig (2008). As already mentioned by Paukstadt & Paukstadt (2008: 160 ff.), both *A. castanea* and *A. mezops* are representatives which occur at higher altitudes only; in Kachin State specimens were collected at altitudes from 1640–2800 m (Figs. 18a, 18b, 19).

With the kind help of V. Zolotuhin, photos of a $\delta$ ST of *A. castanea* deposited in BMNH (Figs. 17a, 17b) including its genitalia (Fig. 24) could be studied. It completely agrees in all details with the known type specimens of *A. mezops* in NRMS, with recently collected material from N.E. Myanmar in the senior author’s collection, with specimens from Yunnan, P.R. China, and from northern Vietnam. Typical features of the $\delta$ are the prolonged fw. apex which is bent backward a little at its acute tip, and the $\delta$ genitalia structures which show almost no differences in material from India, Myanmar, and Vietnam, and both in $\delta$ and $\varphi$ specimens the typical colouration of the ventral wing side with lots of white scales combined with dark, partly almost black areas. The note by Paukstadt & Paukstadt (2008: 159) that there occur differences in $\varphi$ genitalia structures in both species cannot be confirmed when referring to type material of both taxa involved; both $\varphi$ genitalia are almost identical, with some variation in the form of the dorsal process of the valves which is within the specific variability, judging from longer dissection series of the species from different localities.

As a result, *Antheraea* (*Antheraeopsis*) *mezops* Bryk, 1944 is here understood as a new junior subjective synonym of
**Antheraea (Antheraeopsis) castanea** Jordan, 1910 *syn. n.*, and the *♂* lectotype of the latter with data: *Antheraea castanea* Jord., Nov. Zool., 1910; Khasia Hills, Assam; ROTHCHILD Bequest B.M.1939-1; Type [typical red-ringed BMNH label], is herewith designated (Figs. 17a, 17b) from a ST series of 4 ♂♂ and 3 ♀♀ to fix the identity of the taxon to stabilize nomenclature in accordance with the ICZN (1999).

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