

Description of a new species of the *Lethe nigrifascia* LEECH, 1890-group

(Lepidoptera, Nymphalidae, Satyrinae)

by

SONG-YUN LANG & CHUN-HAO WANG

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Abstract: In this paper, a new species of the *Lethe nigrifascia* LEECH, 1890-group, viz. *Lethe luojiani* LANG & WANG spec. nov. from S. Shaanxi and S. Gansu Provinces, China, is described and illustrated.

The *Lethe* (*Zophoessa*) *nigrifascia* LEECH, 1890-group was established by LANG (2015) for the following taxa: *L. nigrifascia* LEECH, 1890, *L. nigrifascia ebiana* LANG, 2015 (= *L. nigrifascia* ab. *fasciata* SEITZ, 1907), *L. baoshana* (HUANG, WU & YUAN, 2003) and *L. liyufei* HUANG, 2014. In this paper, an additional new species of the *L. nigrifascia* LEECH-group from S. Shaanxi and S. Gansu Provinces, China is described.

Abbreviations:

CMNH:	Chongqing Museum of Natural History, Chongqing, China.
IZCAS:	Institute of Zoology, Chinese Academy of Sciences, Beijing, China.
NHRS:	Naturhistoriska Riksmuseet, Stockholm, Sweden.
HH:	HAO HUANG's private collection, Qingdao, China.
LSY:	SONG-YUN LANG's private collection, Shuangliu, Chengdu, China.
WCH:	CHUN-HAO WANG's private collection, Beijing, China.

Specimens of the following related taxa are studied: *Lethe nigrifascia* LEECH: 1 ♂, China: Shaanxi, Ningshan, 1300-1700 m, 27.VIII.2011, leg. YU-FEI LI (LSY); 1 ♂, China: Hunan, Guzhang, Gaowangjie, VII.1998, leg. CHUN-HAO WANG (LSY); 1 ♂, ditto (WCH); 1 ♂, China: Guizhou, Jiangkou, Fanjingshan, 1600-1800 m, 22.VII.2012, leg. CHUN-HAO WANG (WCH); *L. nigrifascia ebiana* LANG: 1 ♂, holotype of ebiana, China: Sichuan, Ebian, Heizhugou, 1800-2000 m, 21.VI.2014, leg. SONG-YUN LANG (LSY); 9 ♂♂, paratypes, ditto, 21.VI.2014, 16-18.VII.2014, legs. YI LANG & SONG-YUN LANG (LSY); 1 ♂, ditto, 17.VII.2014, leg. SONG-YUN LANG (CMNH); 2 ♂♂, ditto, 21.VI.2014, 16.VII.2014, leg. SONG-YUN LANG (HH); *L. liyufei* HUANG: 3 ♂♂, China: Sichuan, Ebian, Heizhugou, 1800-2000 m, 16.-18.VII.2014, legs. YI LANG & SONG-YUN LANG (LSY); 4 ♂♂, China: Sichuan, Shimian, Gongyihai, 2150 m, 10.VII.2015, leg. CHUN-HAO WANG (WCH); 1 ♂, paratype, China: Shaanxi, Ningshan, 1300-1700 m, 14.VII.2012, leg. YU-FEI LI (LSY); 10 ♂♂, China: Shaanxi, Foping, 16.VII.2014, leg. WEN-HAO SUN (LSY); 4 ♂♂, 1 ♀, China: Shaanxi, Huxian, Zhuque, 2200 m, 30.VI.2009, leg. CHUN-HAO WANG (WCH); 11 ♂♂, 4 ♀♀, China: Shaanxi, Fengxian, Jialingjiang-yuan, 1650-2200 m, 2.-7.VII.2009, leg. CHUN-HAO WANG (WCH); 1 ♂, China: Gansu, Zhugou, Chagang, Pianpian-gou, 1970 m, 29.VII.2015, leg. GUO-XI XUE (LSY); *L. baoshana* (HUANG, WU & YUAN): 1 ♂, holotype, China: Yunnan, Baoshan, Yiwanshui, 2840 m, 13.VI.1979 (IZCAS).

Photographs of historic specimen studied by NORDSTRÖM (1934: p. 20) kept in NHRS were provided by Dr. TOBIAS MALM (Sweden).

Androconia (figs. 8a-f) are used currently as a morphological indicator of taxonomic status, and they appear to be relatively consistent in overall size and shape within species (WAKEHAM-DAWSON & KUDRNA, 2000). In this paper, androconia were prepared and measured using the methods described in WAKEHAM-DAWSON & KUDRNA, (2000) & WAKEHAM-DAWSON et al. (2007). The androconia from the specimens of the species group were measured, and lengths (AL = Androconium Length), breadths (AB = Androconium Breadth) and shape ratios (RLB = Ratio of AL/AB) are shown in Table 1.

Table 1. Measurement of Androconia of *Lethe nigrifascia* LEECH-group. AL = Androconium Length (means ± standard deviation, SD); AB = Androconium Breadth (means ± SD); Shape ratios RLB = Ratio of AL/AB (means ± SD); N = Number of androconia measured for each taxon.

Taxa	AL (um)	AB (um)	RLB	N
<i>L. luojiani</i> spec. nov.	163.60 ± 5.55	14.50 ± 1.91	11.50 ± 1.67	10
<i>L. nigrifascia nigrifascia</i> LEECH	154.90 ± 7.26	20.85 ± 1.40	7.46 ± 0.55	10
<i>L. nigrifascia ebiana</i> LANG	149.00 ± 6.91	30.30 ± 4.82	5.02 ± 0.68	10
<i>L. liyufei</i> HUANG	204.35 ± 16.46	21.00 ± 2.84	9.92 ± 1.64	10
<i>L. baoshana</i> HUANG, WU & YUAN	148.80 ± 6.31	26.60 ± 3.44	5.66 ± 0.57	5

***Lethe luojiani* spec. nov.** (figs. 1-3, 7, 8f, 9, 13a)

Lethe nigrifascia subsp. *fasciata*: NORDSTRÖM (nec SEITZ), 1934. Arkiv för Zoologi 27 A 7: 20.

Holotype ♂, China: Shaanxi, Fengxian, Jialingjiang-yuan, road to the Mt. top, 2200 m, 3.VII.2009, leg. CHUN-HAO WANG, Ex. JIAN LUO Coll. (LSY). Paratypes: 1 ♂, China: Shaanxi, Huxian, Xihe, 29.VI.2009, leg. CHUN-HAO WANG (WCH); 1 ♂, /NHRS-TOBI 000001023/Kina S. Kansu/SVEN HEDINS Exp. Ctr. Asien Dr HUMMEL/27/6/*L. nigrifascia* v. *fasciata* (NHRS).

Diagnosis: The new species can be distinguished from other related taxa of the *Lethe nigrifascia* LEECH-group by the combination of the following characters:

1. The new species is smaller (forewing length, FWL = 25-26 mm) than *L. nigrifascia nigrifascia* LEECH (FWL = 29-32 mm) and *L. liyufei* HUANG (FWL = 30.5-33 mm).
2. The forewing apex of the new species is round and less protruding, whereas it is elongated in *L. liyufei* HUANG.
3. The ♂ brand of the new species on forewing upperside is narrow, whereas it is broad in *L. nigrifascia nigrifascia* LEECH.
4. In lateral view, the dorsal ridge of the aedoeagus of the new species is flat near its caudal end, whereas it is concaved just before the caudal end in *L. liyufei* HUANG.
5. In dorsal view, the inner margin of the tip of the valva (fig. 13) of the new species is clearly toothed, whereas they are smooth or weakly toothed in *L. nigrifascia nigrifascia* LEECH and *L. nigrifascia ebiana* LANG.
6. Androconia of the new species are moderate in length and constantly narrow in width, with the RLB is the highest in the species group (see table 1).

Etymology: The specific name *luojiani* is named after Mr. JIAN LUO, a retired Major General of the PLA from Beijing, who has collected butterflies in China for dozens of years.

Notes: Based upon 1 ♂ collected by HUMMEL in Schwedisch-chinesische wissenschaftliche Expedition from S. Gansu (no exact locality can be found from the labels of the single specimen, but on 27/6 [1930], the team members were at Min-chow [nowaday Minxian County]), this new species had been misidentified by NORDSTRÖM (1934) as *Lethe nigrifascia* subsp. *fasciata* SEITZ. The photographs of the specimen (fig. 7), studied by NORDSTRÖM, which is kept in NHRS were provided by MALM, and it is designated here as a paratype of *L. luojiani* spec. nov.

Distribution: China (S. Shaanxi, S. Gansu).

Discussion: It is possible that *L. nigrifascia ebiana* LANG is not conspecific with the typical *L. nigrifascia* LEECH, because both, their superficial appearance and morphology of androconia are different from each other. However, the validity of the name *ebiana* LANG is still negotiable. When described *ebiana* LANG, the name *fasciata* SEITZ was considered as an infrasubspecific name (HUANG, 2014; LANG, 2015), but according to LAMAS (pers. comm.): „The name *fasciata* SEITZ appeared first on SEITZ's pl. 31, which was published in part (Lieferung) 17 of vol. 1 of Die Gross-Schmetterlinge der Erde. This part 17 was published on 14 October 1907 (received at the BMNH on 29 October 1907), and consisted of pp. 77-84 and pl. 31. However, the text referring to the butterfly illustrated as „*Lethe fasciata*“ on pl. 31 was only published later, in part 18, on 5 November 1907 (received at the BMNH on 26 November 1907). Part 18 consisted of pp. 85-92 and pls. 36 & 45. Therefore, the name „*Lethe fasciata*“ became available on publication of pl. 31, that was on 14 October 1907, but without any indication about its taxonomic status, which only became explicit when p. 86 of the text was published (on 5 November), and where SEITZ regarded it as a „smaller form“ [kleinere Form] of *L[ethe] nigrifascia* LEECH, calling it „ab. *fasciata*“ and referring to the illustration on pl. 31, row d. Given that situation, it could be argued that the name „*fasciata*“ was first established by SEITZ as a specific name, and was later (actually, 3 weeks later) „downgraded“ by him to an infrasubspecific name. If this argument were to be accepted, *Lethe nigrifascia ebiana* LANG would be a junior subjective synonym of *fasciata* SEITZ, 1907.“

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Addresses of the authors

SONG-YUN LANG
Chongqing Museum of Natural History
Wenxing-Wan No. 42,
Beibei, Chongqing, 400700, China

CHUN-HAO WANG
Anzhen-li, 3-22-701
Chaoyang District
Beijing, 100029, China

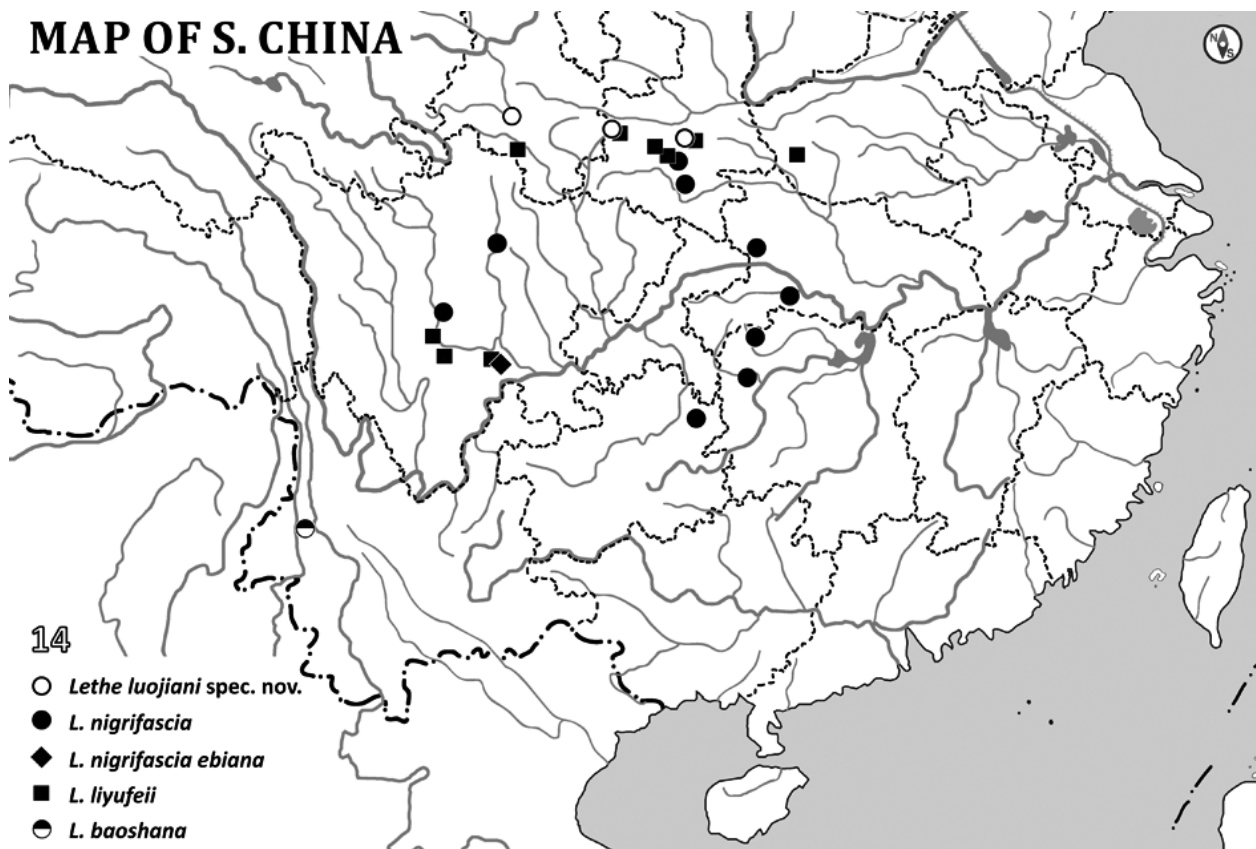


Fig. 14: Map of S. China with distribution records of the *Lethe nigrifascia* LEECH-group (Sources of data: LEECH, 1890; NORDSTRÖM, 1934; BOZANO, 1999; HUANG, 2014; LANG, 2015; Specimens examined in this study).

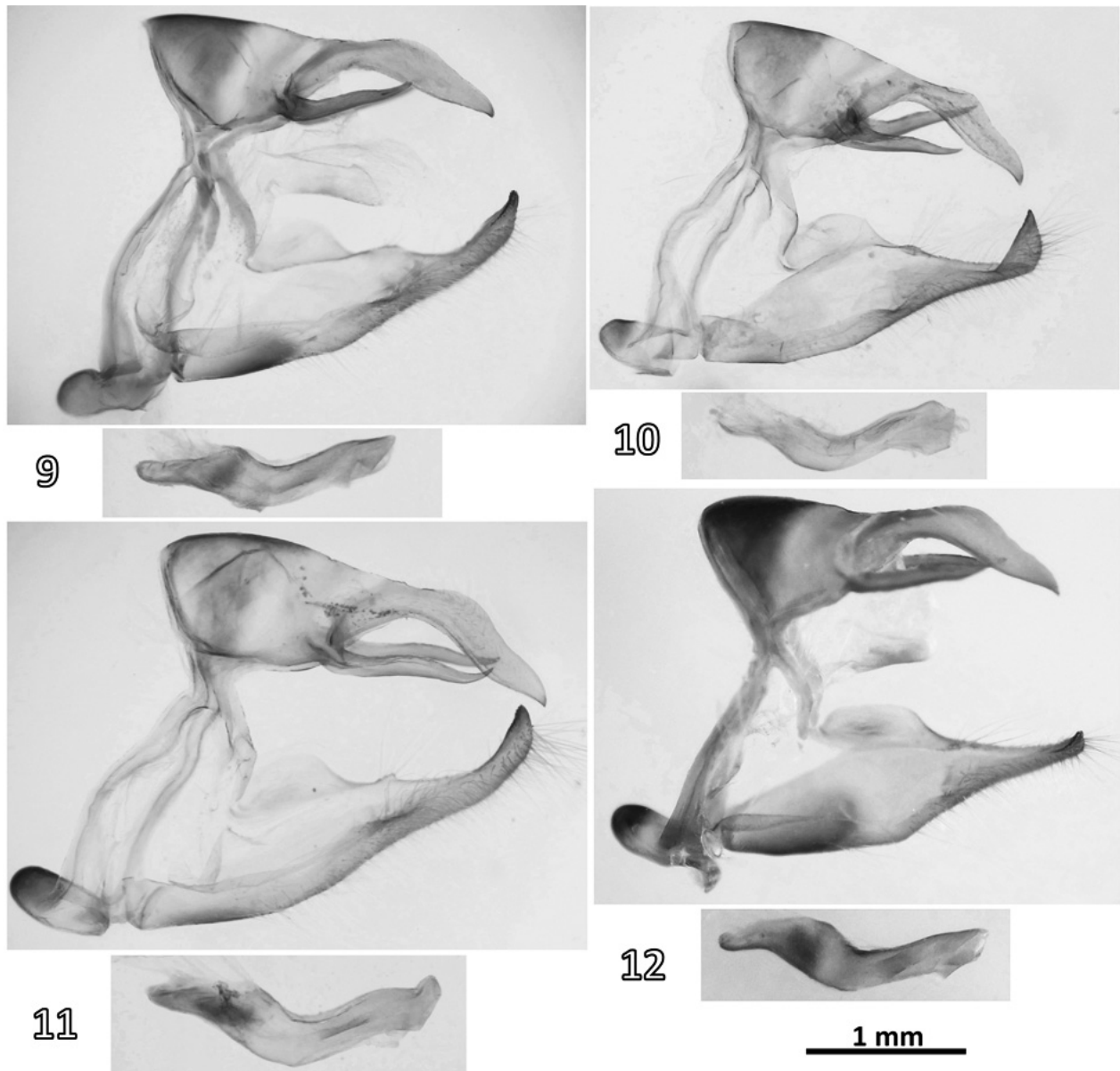


Fig. 9: ♂ genitalia of *Lethe luojiani* **spec. nov.** in lateral view with left valva removed, holotype, China, Shaanxi, Fengxian, LSY.
 Fig. 10: ♂ genitalia of *Lethe nigrifascia ebiana* LANG, 2015 in lateral view with left valva removed, holotype, China, Sichuan, Ebian, LSY.
 Fig. 11: ♂ genitalia of valva of *Lethe liyufei* HUANG, 2014 in lateral view with left valva removed, China, Sichuan, Ebian, LSY.
 Fig. 12: ♂ genitalia of *Lethe nigrifascia* LEECH, 1890 in lateral view with left valva removed, China, Shaanxi, Ningshan, LSY, photographed by Mr. HAO HUANG.

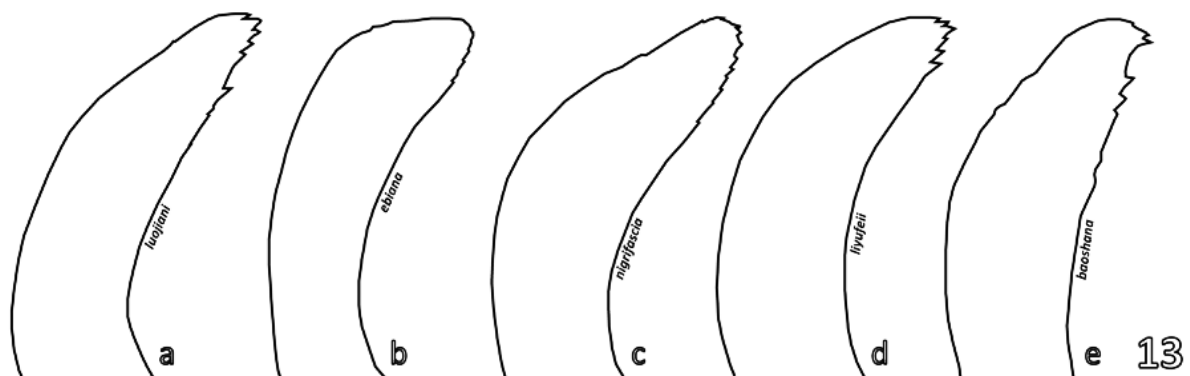


Fig. 13: Tip of the ♂ valva in dorsal view. (a) *Lethe luojiani* **spec. nov.**, holotype, China, Shaanxi, Fengxian, LSY; (b) *Lethe nigrifascia ebiana* LANG, 2015, holotype, China, Sichuan, Ebian, LSY; (c) *Lethe nigrifascia* LEECH, 1890, China, Shaanxi, Ningshan, LSY; (d) *Lethe liyufei* HUANG, 2014, China, Sichuan, Ebian, LSY; (e) *Lethe baoshana* (HUANG, WU & YUAN, 2003), holotype, China, Yunnan, Baoshan, Yiwanshui, IZCAS.

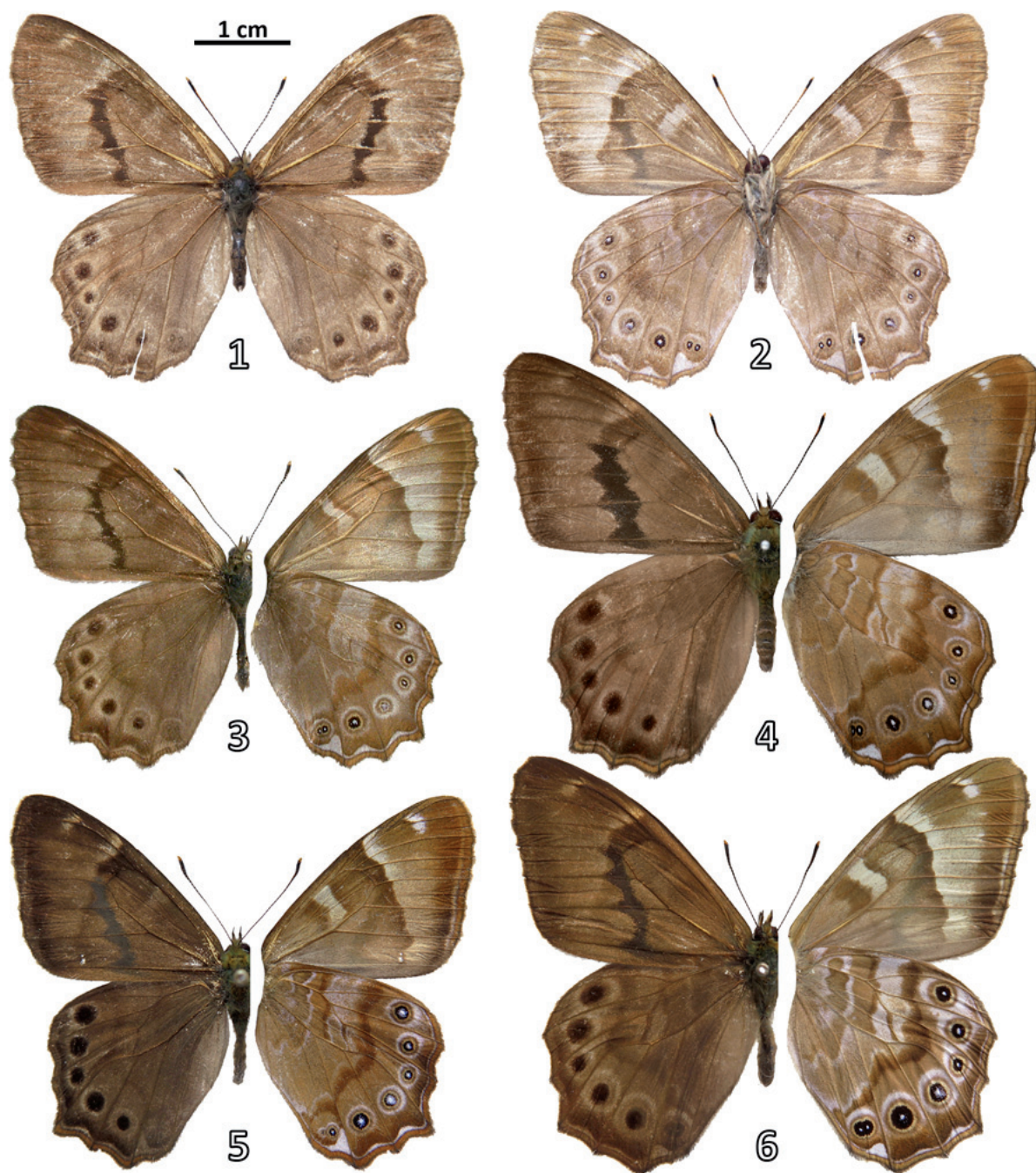
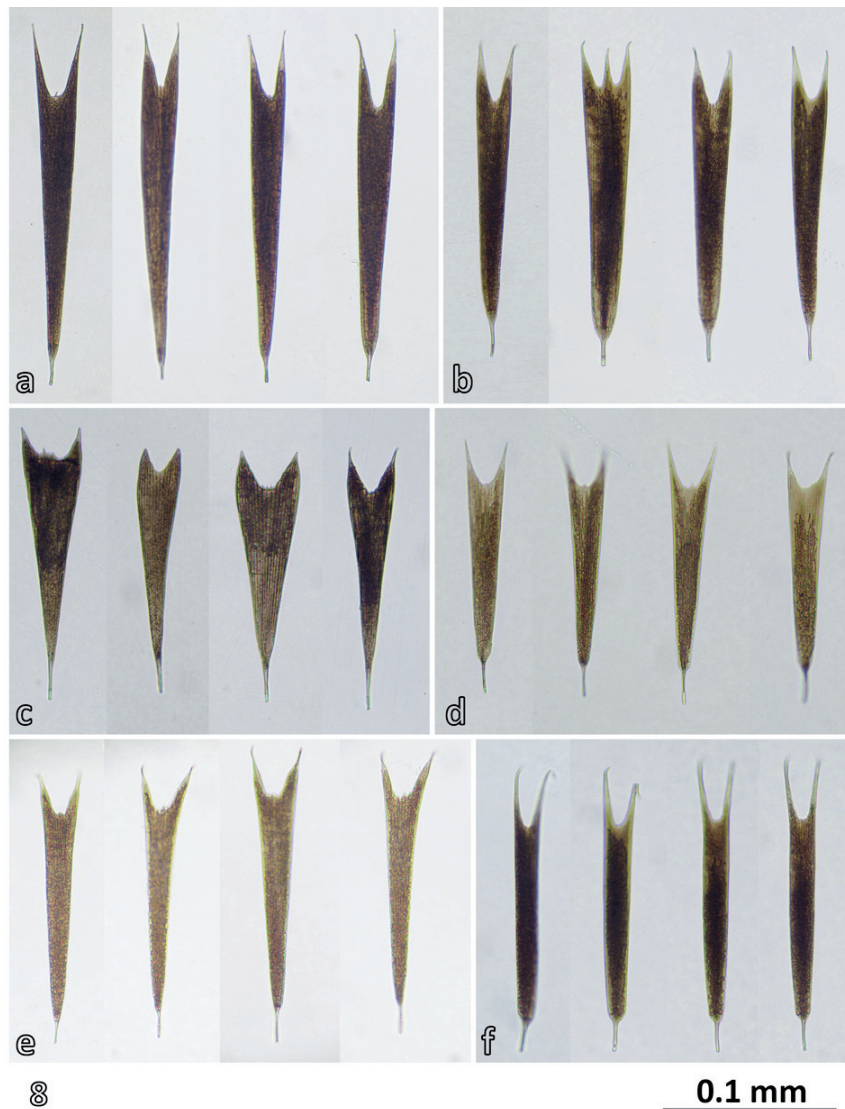


Fig. 1, 2: *Lethe luojiani* **spec. nov.**, holotype ♂, China, Shaanxi, Fengxian, LSY, dorsal- and ventral side.
 Fig. 3: *Lethe luojiani* **spec. nov.**, paratype ♂, China, Shaanxi, Huxian, WCH, dorsal- and ventral side.
 Fig. 4: *Lethe nigrifascia* LEECH, 1890, ♂, China, Guizhou, Jiangkou, WCH, dorsal- and ventral side.
 Fig. 5: *Lethe nigrifascia ebiana* LANG, 2015, paratype ♂, China, Sichuan, Ebian, LSY, dorsal- and ventral side.
 Fig. 6: *Lethe liyufei* HUANG, 2014, ♂, China, Shaanxi, Foping, LSY, dorsal- and ventral side.



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Fig. 7: *Lethe luojiani* spec. nov., paratype ♂, China, S. Kansu, NHRS-TOBI 000001023, NHRS, dorsal-, ventral side & label, photographed by Dr. TOBIAS MALM © Naturhistoriska Riksmuseet.



8

0.1 mm

Fig. 8: Androconia. (a) *Lethe liyufei* HUANG, 2014, China, Sichuan, Ebian, LSY; (b) *Lethe liyufei* HUANG, 2014, paratype, China, Shaanxi, Ningshan, LSY; (c) *Lethe nigrofascia ebiana* LANG, 2015, paratype, China, Sichuan, Ebian, LSY; (d) *Lethe nigrofascia* LEECH, 1890, CHINA, Shaanxi, Ningshan, LSY; (e) *Lethe nigrofascia* LEECH, 1890, China, Hunan, Guzhang, LSY; (f) *Lethe luojiani* spec. nov., holotype, China, Shaanxi, Fengxian, LSY.

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