

**Zanclognatha Species in Mt. Changbai, with Description of a  
New Species and Two Unknown Species from China  
(Lepidoptera: Noctuidae)**

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**ABSTRACT**

In the lepidopteran surveys in Mt. Changbai, China, during 2000-2003, 10 species of the genus *Zanclognatha* Lederer of Noctuidae were recognized. Of them, a new species, *Zanclognatha lui* sp. nov. is described, two species (*Zanclognatha umbrosalis* Staudinger and *Z. perfractalis* Bryk) are reported for the first time from China, and four species (*Z. fumosa*, *Z. lilacina*, *Z. violacealis* and *Z. tarsipennalis*) are newly known from Mt. Changbai. Synonymies, distributional ranges, photos of the genitalia, and images of the new and newly recorded species are given.

Key words: taxonomy, Mt. Changbai, Herminiinae, *Zanclognatha*, China

**INTRODUCTION**

The genus *Zanclognatha* Lederer belonging to the subfamily Herminiinae are medium sized moths, and it comprises 96 species in the world (Poole, 1989). The genus is characterized by the male antenna with a large knot, the sickle-shaped and upturned labial palpus, forewing with  $R_{3+4}$ ,  $R_5$  connate from areole, and hindwing with  $M_3$  and  $CuA_1$  connate. Owada (1977) grouped the genus into two species-groups, *yakushimalis*-group and *leechi*-group, according to the different shape of the valva of the male genitalia: *yakushimalis*-group with ramificated valva and *leechi*-

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group unramificated. In China, 29 species of the genus *Zanclognatha* have been known (Wu, 1938; Bryk, 1948; Draudt, 1950; Chen, 1982, 1985, 1991, 1999), however, in Mt. Changbai (China part), three species (*Z. lunalis* (Scopoli), *Z. curvilinea* (Wileman & South), and *Z. helva* Butler) were reported by Wu et al. (1999).

In the recent surveys in Mt. Changbai during 2000-2003 by authors, 10 species of the genus *Zanclognatha* were recognized, including a new species, *Zanclognatha lui* sp. nov. *Zanclognatha umbrosalis* Staudinger and *Z. perfractalis* Bryk are reported for the first time from China. However, the previously known species, *Z. helva* (Butler), was not found in this study.

## MATERIALS AND METHODS

Specimens examined were collected by K. T. Park, L. S. Lu, D. Y. Jin and H. L. Han during expeditions in 2000-2003, and preserved in the Center for Insect Systematics, Kangwon National University, Korea, and a part of them are in the College of Agriculture, Yanbian National University, China. The color standard for the description of adults follows Korerup and Wanscher (1978).

## SYSTEMATIC ACCOUNTS

### Genus *Zanclognatha* Lederer, 1857

Type species: *Pyralis tarsiolumalis* Hübner, 1796 (Europe)

#### \**Zanclognatha lui* Han and Park, sp. nov. (Figs. 1A-D, 3A-B)

**Types.** Holotype: male, Mt. Changbai, Malugou 730 m, Changbai, 6-7 VIII 2002 (Park, Han, Kim), genital slide no. CN-244. Paratypes: 3♂, Mt. Changbai, Erdaobaihe 750 m, 11 VIII 2003 (Han, Jin), 1♂, Mt. Changbai, Weidong 970 m, Fusong, 12 VIII 2003 (Han, Jin), gen. sl. no. CN-243.

**Diagnosis.** The new species is very close to *Z. lunalis* (Scopoli), but it is bigger than the latter in size. Details for their morphological difference are given in Table 1.

**Description.** Male. Wingspan 28-35 mm. Basal shaft of antenna slender (Fig. 1B), median dilated part thinner than that of *Z. lunalis*. Labial palpus gently upturned (Fig. 1C), 3rd segment as long as 2nd, whereas shorter in *Z. lunalis*. Coxa and trochanter of the foreleg (Fig. 1D) similar to those of *Z. lunalis*, but other joints different: femur slender, slightly shorter or as long as coxa, basal part of ventral margin swollen and slightly sclerotized; tibia extremely broad, mellon seed-shaped, 2/3 as long as femur, overlapped 1st tarsus; 1st tarsus about 2/3 as long as tibia, slightly narrower in terminal part; other tarsal segments slender, short, total length almost half length of 1st, and 2nd-5th-3rd-4th by turns in length; hair tufts in pretarsus developed. Forewing with antemedian line convex before middle, slightly serrate; median band darker than ground color; connected to reniform spot; reniform spot dark brown, linear, located at middle above cell, sometimes obscure;

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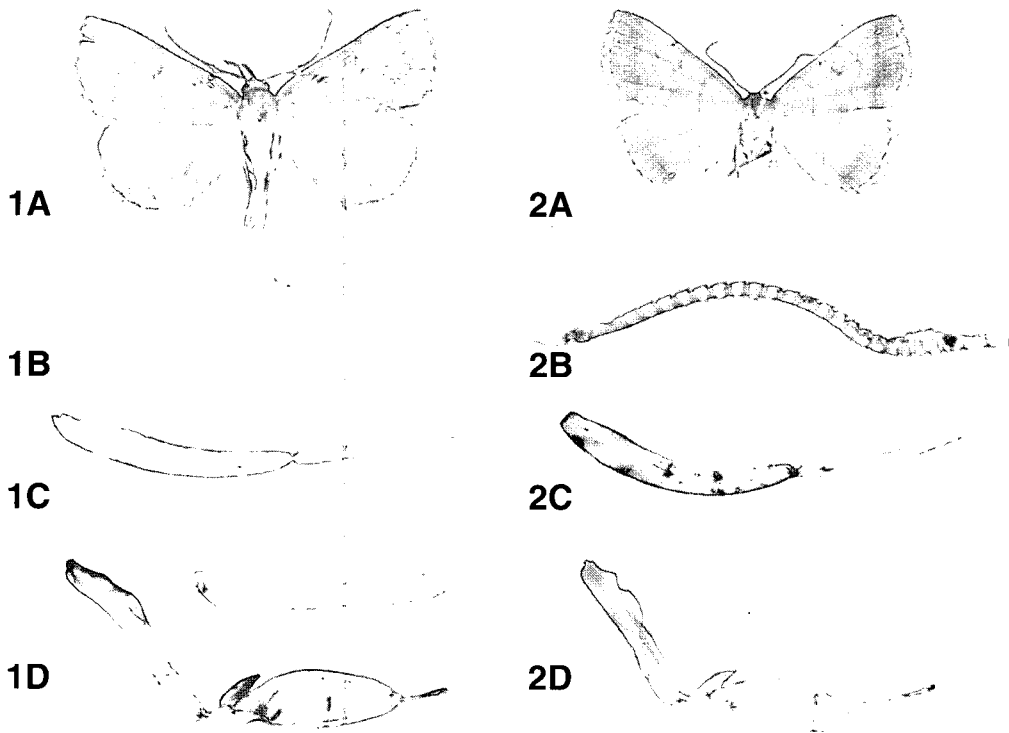
**Table 1.** Comparison of the superficial and male genital characteristics of *Zanclognatha lui* sp. nov. and *Zanclognatha lunalis*.

Characters	Species <i>Z. lui</i> sp. nov.	<i>Z. lunalis</i>
Labial palpus	Gently upturned, 3rd segment as long as 2nd.	Strongly upturned, 3rd segment shorter than 2nd.
Antenna	Basal shaft slender; median dilated part thin.	Basal shaft bulbous; median dilated part thick.
Forewing	Antemedian line strongly convex before middle; median band well-developed; postmedian line less convex medially; subterminal line without creamy white line outwardly.	Antemedian line moderately convex; median band obscure; postmedian line strongly convex medially; subterminal line edged by creamy white line.
Foreleg	Femur as long as tibia + tarsus; slightly bent at basal 1/3, slightly emarginate on basal part ventro-medially; tibia, melon-seed-shaped; 1st tarsus broad, length of other tarsus arranged 2nd-5th-3rd-4th by turn.	Femur shorter than tibia+tarsus, deeply emarginate on basal part ventro-medially; tibia budding leaf-shaped; 1st tarsus slender, length of other tarsus arranged 2nd-3rd-5th-4th by turn.
Male genitalia	Uncus: convex dorsally beyond middle. Valva: costa less convex; 1st and 2nd processes of cucullus short with short, bifurcation; 3rd slender taeniated. Juxta: as long as width of valva with acute apex. Aedeagus: straight; cornuti consist of a row of 5-6 horn-shaped spines laterally, a series of 3-4 long horn-shaped, and 5-6 short conic spines on spiculate surface; vesica terminated into broad tubular.	Uncus: concave dorsally beyond middle. Valva: costa strongly convex; 1st and 2nd processes of cucullus long, with deep bifurcation; 3rd strong with acute apex. Juxta: larger, longer than width of valva with round apex. Aedeagus: curved medially; cornuti consist of a zone of numerous spicules dorsally, with 5-6 long horn-shaped spines, 7-9 short ones laterally, and a zone of spicules ventrally; vesica tapered into slender tubular.

postmedian line thin, arising from costa, convex before middle and incurved to CuA<sub>1</sub>, then slightly curved outwardly, reaching to inner margin; subterminal line dark brown, arising from costa near apex and reaching to before tornus, almost straight; fringes grayish, with a pale ochreous basal line. Hindwing fuscous, as wide as forewing; discal spot indistinct, small; median line obscure; subterminal line distinct, darker; fringes concolorous. Female is unknown.

**Male genitalia** (Fig. 3). Uncus convex beyond middle dorsally, shorter than that of *lunalis*. Valva trifurcate, asymmetrical; costa almost straight before middle; 1st process of distal part short and acute; 2nd digitate with round apex; 3rd slender, taeniated. Juxta conic, as long as width of valva, with acute apex. Saccus short, triangular. Aedeagus almost straight; cornuti consist of 2 series of horn-shaped spines: one row of 5-6 horn-shaped spines and the other mixed with 3-4 long and 5-6 short horn-shaped spines on spiculate surface.

**Distribution.** China (Mt. Changbai).



**Fig. 1A-D.** *Zanclognatha lui* sp. nov. **Fig. 2A-D.** *Z. lunalis*. 1A-2A, adults; 1B-2B, antennae; 1C-2C, labial palpi; 1D-2D, forelegs.

### Newly reported species from China

#### \**Zanclognatha umbrosalis* Staudinger, 1892 (Figs. 5, 13A-C)

*Zanclognatha umbrosalis* Staudinger, 1892. p. 613, pl. 14, fig. 8; Herz, 1904, p. 324; Owada, 1992, p. 189; Kononenko et al., 1998, p. 34.

*Zanclignatha triplex koreognatha* Bryk, 1948, p. 147.

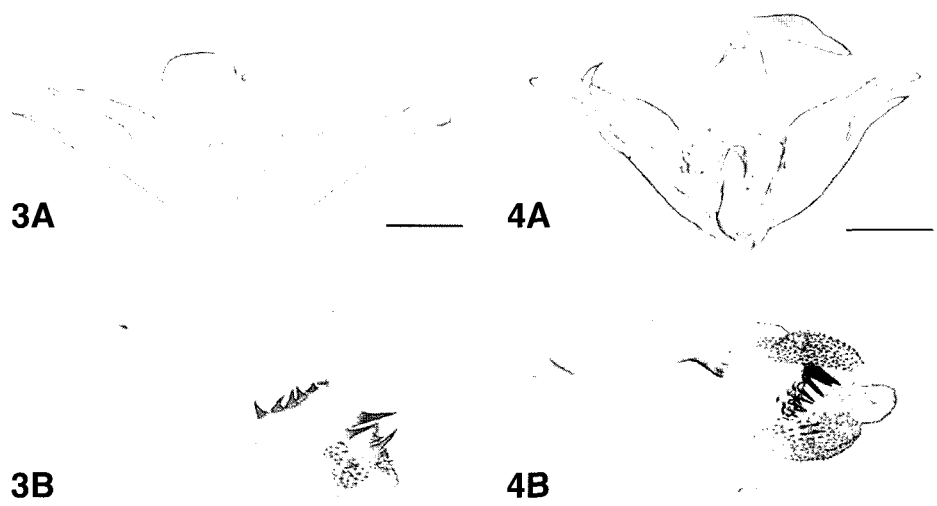
*Zanclignatha leechi* South, 1905, p. 74; Owada, 1982a, p. 929; 1982b, p. 407; 1987, p. 114.

**Diagnosis.** Wingspan 24-25 mm. Forewing ground color is dark fuscous; with antemedian line broad, dark, wavy; median line blurred, almost straight; reniform spot small, often inconspicuous; postmedian line broad, curved outwardly from costa to  $M_3$ , then incurved, slightly wavy; marginal line weak paler than ground color. Hind wing is fuscous, with median line often distinct; postmedian line blurred, darker than ground color at anal angle.

**Male genitalia** (Figs. 13A-B). Uncus sickle-shaped. Valva broad at basal half, then suddenly narrowed from middle to apex; costa slightly expanded at basal 1/3. Aedeagus slender, slightly curved; cornutus horn-shaped, strong, longer, bifurcated basally.

**Female genitalia** (Fig. 13C). Ductus bursae heavily sclerotized at distal half, with bilateral

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**Fig. 3A-B.** *Zanclognatha lui* sp. nov. **Fig. 4A-B.** *Z. lunalis*. 3A-4A, male genitalia; 3B-4B, aedeagi. Scales = 1 mm.

processes anteriorly; cervix bursae small, slightly shrank; corpus bursae round, with strong spines forming a semicircle.

**Material examined.** 1 ♀, Chongshan 600 m, Helong, 31 VII 2000 (Park, Lee, Han); 1 ♂, Longjing 280 m, 12 VII 2001 (Park, Sohn, Han); 1 ♂, Weidong 1,250 m, Fusong, 16 VII 2001 (Park, Sohn, Han); 2 ♀, Malugou 730 m, Changbai, 6-7 VIII 2002 (Park, Han, Kim).

**Distribution.** China (new record), Korea (North, South), Japan, Russia (RFE-Primorye, Khabarovsk).

**\**Zanclognatha perfractalis* Bryk, 1948 (Figs. 6, 12A-B)**

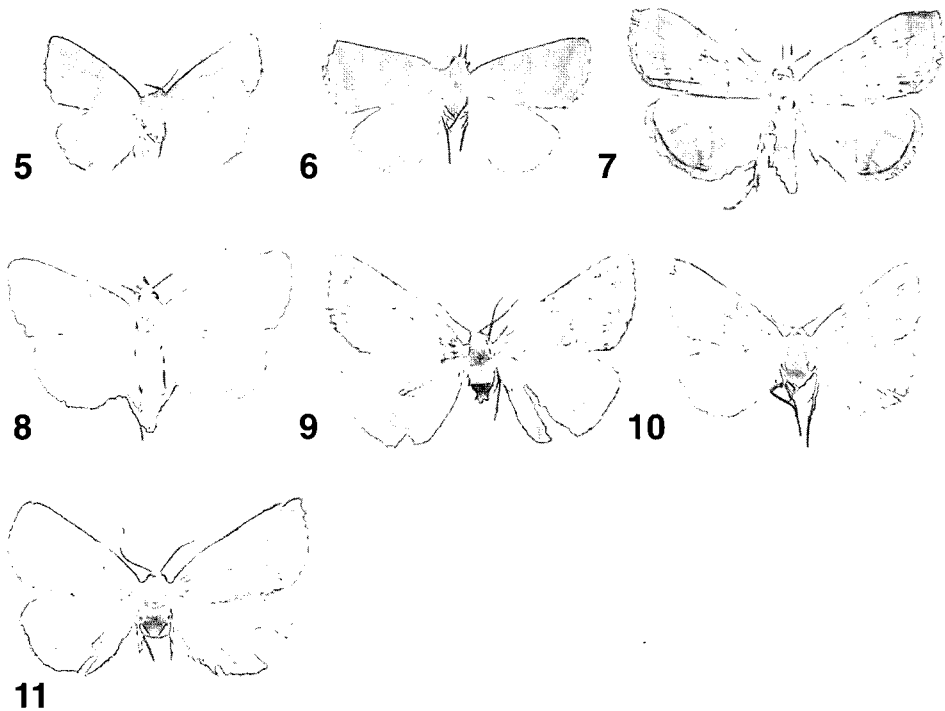
*Zanclognatha perfractalis* Bryk, 1948, p. 147, pl. 6, fig. 7; Owada, 1992, p. 189.

*Zanclognatha southi* Owada, 1982, p. 929; 1987, p. 115; Kononenko et al., 1998, p. 34.

**Diagnosis.** Wingspan 21-23 mm. Forewing ground color is dark fuscons. Wing Coloration is similar to that of *Z. lunalis*, with antemedian line broad, waved; median line broad, dark; reniform spot dark; very small, or sometimes absent; postmedian line thin, waved; subterminal line broad, dark, curved at middle. Hindwing is paler than forewing, with median line indistinct and postmedian line broad blurred, darker at near anal angle.

**Male genitalia** (Figs. 12A-B). Very similar to those of *Z. umbrosalis*. Distal part of valva not sharply pointed. Saccus "V"-shape. Juxta weakly sclerotized, with very small pellet, or tiny spines. Aedeagus slender, slightly curved beyond middle; cornutus shorter and broader than that of *Z. umbrosalis*.

**Material examined.** 1 ♂, 1 ♀, Malugou 730 m, Changbai, 7 VIII 2002 (Park, Sohn, Han); 1 ♂, Jiashan 510 m, Helong, 14 VIII 2003 (Han, Jin).



**Figs. 5-11.** Adults. 5, *Zanclognatha umbrosalis*; 6, *Z. perfractalis*; 7, *Z. fumosa*; 8, *Z. tarsipennalis*; 9, *Z. lilacina*; 10, *Z. violacealis*; 11, *Z. curvilinea*.

**Distribution.** China (new record), Korea (North, Central), Japan, Russia (RFE-Primorye territory).

### Newly reported species from Mt. Changbai

#### \**Zanclognatha fumosa* Butler, 1879 (Fig. 7)

*Herminia fumosa* Butler, 1879, p. 62, pl. 56, fig. 8.

**Material examined.** 2 ♀, Jiashan 600 m, Helong, 1-2 VIII 2000 (Park, Lee, Han).

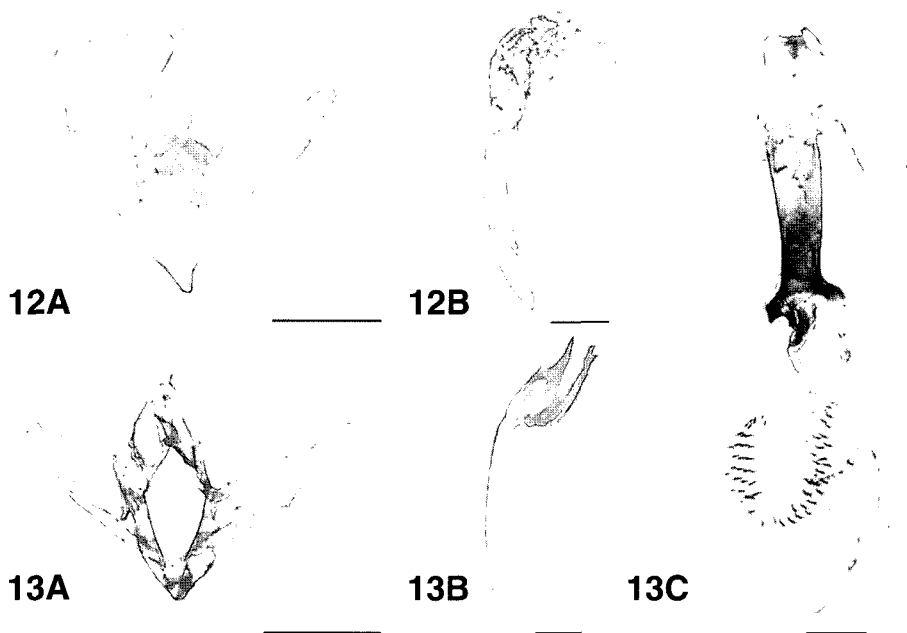
**Distribution.** China (Jilin, Heilongjiang), Korea (North, South), Japan, Russia (RFE-Primorye territory).

#### \*\**Zanclognatha tarsipennalis* (Treitschke, 1835) (Fig. 8)

*Herminia tarsipennalis* Treitschke, 1835. p. 5.

**Material examined.** 1 ♀, Erdao power plant 760 m, Antu, 30 VII 2000 (Park, Lee, Han); 1 ♂, Jiashan 680 m, Helong, 13 VII 2001 (Park, Sohn, Han); 1 ♀, Malugou 730 m, Changbai, 6-7 VIII 2002 (Park, Han, Kim).

**Distribution.** China (Jilin, Hubei, Taiwan), Korea (North, South), Japan, Russia (European part, S Siberia, RFE), Caucasus, Turkey, N. Africa.



**Fig. 12A-B.** *Zanclognatha perfractalis*. **Fig. 13A-C.** *Z. umbrosalis*. 12A-13A and 12B-13B, male genitalia; 13C, female genitalia. Scales = 1 mm.

<sup>1</sup>***Zanclognatha lilacina* Butler, 1879 (Fig. 9)**

*Mesoplectra lilacina* Butler, 1879, p. 65, pl. 57, fig. 3; Leech, 1889, p. 566; 1900, p. 618.

**Material examined.** 1 ♀, Chongshan 600 m, Helong, 14 VII 2001 (Park, Sohn, Han).

**Distribution.** China (Jilin, Zhejiang, Jiangxi, Fujian), Korea (North, Central), Japan, Russia (RFE-Primorye territory).

<sup>2</sup>***Zanclognatha violacealis* Staudinger, 1892 (Fig. 10)**

*Zanclognatha violacealis* Staudinger. 1892, p. 612, pl. 14, fig. 6.

**Material examined.** 1 ♀, Malugou 730 m, Changbai, 6-7 VIII 2002 (Park, Han, Kim).

**Distribution.** China (Jilin, Heilongjiang), Korea (North), Japan, Russia (RFE-Primorye territory, S Khabarovsk terr., Amur region, S Sakhalin).

**New collecting data for the previously reported species from Mt. Changbai**

<sup>3</sup>***Zanclognatha lunalis* (Scopoli, 1763) (Figs. 2A-D, 4A-B)**

*Phalaena lunalis* Scopoli, 1763, p. 241, fig. 612.

**Material examined.** 3 ♀, Chongshan 600 m, Helong, 31 VII 2000 (Park, Lee, Han); 1 ♂, 4 ♀, Jiashan 600 m, Helong, 1-2 VIII 2003 (HL Han, DY Jin); 2 ♂, 1 ♀, Chongshan 600 m, Helong, 14 VII 2001 (Park, Sohn, Han); 3 ♂, 5 ♀, Yadong 760 m, Helong, 19 VII 2001 (Park, Sohn,

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Han); 1♂, 1♀, Jiashan 600 m, Helong, 20 VII 2001 (Park, Sohn, Han); 2♂, 2♀, Malugou 730 m, Changbai, 6-7 VIII 2002 (Park, Han, Kim); 1♂, Weidong 970 m, Fusong, 12 VIII 2003 (HL Han, DY Jin); 4♂, 6♀, Jiashan 510 m, Helong, 14 VIII 2003 (HL Han, DY Jin); 2♂, 1♀, Renchuan 370 m, Longjing, 15 VIII 2003 (HL Han, DY Jin); 1♂, 1♀, Yongxin 570 m, Longjing, 16 VIII 2003 (HL Han, DY Jin).

**Remark.** The species was reported from Mt. Changbai by Wu et al. (1999), and the first reported from Korea was as a subspecies *chosensis* Bryk, 1948.

**\**Zanclognatha curvilinea* (Wileman & South, 1917) (Fig. 11)**

*Paracolax curvilinea* Wileman & South, 1917, p. 27.

**Material examined.** 1♀, Malugou 730 m, Changbai, 6-7 VIII 2002 (Park, Han, Kim).

**Remark.** The species was reported from Mt. Changbai by Wu et al. (1999).

**\*\**Zanclognatha helva* (Butler, 1879)**

*Herminia helva* Butler, 1879, p. 477; Leech, 1989, p. 563.

**Remark.** The species was reported from Mt. Changbai by Wu et al. (1999), but it was not found during the expeditions in 2000-2003. However, there is no doubt for its distribution in Mt. Changbai, because its distributional range covers from Primorye territory to China and Japan, including the Korean peninsula.

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장백산의 *Zanclognatha*속 1신종 기재 (나비목: 밤나방科) 및  
중국 미기록 2종의 보고

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요 약

2000-2003년에 걸쳐 수행된 장백산의 나방류 조사결과로 *Zanclognatha*속 10종이 확인 되었다. 그들 중 한 종을 신종(*Zanclognatha lui* sp. nov.)으로 기재하고, *Zanclognatha umbrosalis* Staudinger, *Z. perfractalis* Bryk 등 2종을 중국 미기록으로 보고 한다. *Z. fumosa*, *Z. lilacina*, *Z. violacealis*, *Z. tarsipennalis* 등 4종은 장백산에서 처음 보고 되는 종들이다. 새로이 밝혀진 신종, 중국미기록 2종에 대해 성충의 외부특징과 암수생식기의 특징에 대해 간략히 기술하고, 성충의 사진과 함께 암수생식기를 도해하였다.