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A systematic study on *Gibberifera* Obraztsov, 1946 from China¹ (Lepidoptera: Tortricidae,
Olethreutinae)

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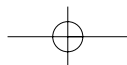
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A systematic study on *Gibberifera* Obraztsov, 1946 from China¹ (Lepidoptera: Tortricidae, Olethreutinae)

A. H. Zhang & H. H. Li

Abstract

This paper deals with eight species of the genus *Gibberifera* Obraztsov from China. One new species, *G. clavata* Zhang & Li, sp. n., is described. The female of *G. monticola* Kuznetsov is described for the first time in science. A key to the Chinese species is given.

KEY WORDS: Lepidoptera, Tortricidae, Olethreutinae, *Gibberifera*, new species, China

Un estudio sistemático sobre *Gibberifera* Obraztsov, 1946 de China (Lepidoptera: Tortricidae, Olethreutinae)

Resumen

Este trabajo trata ocho especies del género *Gibberifera* Obraztsov de China. Se describe una nueva especie *G. clavata* Zhang & Li, sp. n. Se describe por primera vez para la ciencia la hembra de *G. monticola* Kuznetsov. Se da una clave de las especies chinas.

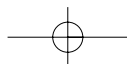
PALABRAS CLAVE: Lepidoptera, Tortricidae, Olethreutinae, *Gibberifera*, nueva especie, China

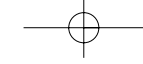
Introduction

The genus *Gibberifera* was erected by Obraztsov in 1946 for *Penthina simplana* Fisher v. Roeslerstamm, which is distributed in the Palearctic and Oriental regions. DIAKONOFF (1964) described one species, *G. obscura*, from Nepal. KUZNETSOV (1971) reported three Chinese species, viz. *G. monticola*, *G. mienshana* and *G. similis*. KAWABE & NASU (1994) revised this genus and described four species, *G. angkhangensis*, *G. nigrovena*, *G. hepaticana*, *G. alba*, and upgraded *G. simplana glacata* to specific status. NASU & LIU (1996) described two Chinese species, *G. qingchengensis* and *G. yadongensis*. KUZNETSOV (2001) transferred *G. similis* to *Gyposoma* Meyrick. Totally eleven species in *Gibberifera* have been described up to date, seven of which were reported to occur in China (KAWABE & NASU, 1994, NASU & LIU, 1996, LIU & LI, 2002).

In the present paper a checklist of the known Chinese species of *Gibberifera* Obraztsov is given. One new species is described and the female of *G. monticola* Kuznetsov is reported for the first time. All the studied specimens, otherwise mentioned, are deposited in the Department of Biology, Nankai University, Tianjin, P. R. China.

¹ The research was supported by the National Natural Science Foundation of China for the Special Program.





Abbreviations: TL (type locality); IZCAS (the Institute of Zoology, Chinese Academy of Sciences); MGAB (Muzeul de Istorie Naturala, "Grigore Antipa", Bucuresti, Romania).

Gibberifera Obraztsov, 1946

Gibberifera Obraztsov, 1946, *Z. wien. Ent. Ges.*, **30**: 26, 35. Type species: *Penthina simplana* Fisher v. Roeslerstamm, 1835.

Gibbifera: RAZOWSKI, 1987, *Monografie Fauny Pol.*, **15**: 143; RAZOWSKI, 1989, *Acta zool. cracov.*, **32**(7): 168. [Missp.]

Generic diagnosis: Venation. Forewing with all veins separated, chorda and M-stem present except in *G. hepaticana* chorda absent (KAWABE & NASU, 1994). Hindwing with M₃ and CuA₁ stalked.

Male genitalia: Uncus clubbed or apically bifurcated, but in *G. alba* uncus absent (KAWABE & NASU, 1994); socius broad, setose, drooping. Valva with large basal opening; neck distinct; sacculus setose; cucullus oblong or oval, setose, with a slender process on ventral angle bearing a stout spine at apex. Aedeagus with many deciduous cornuti and sometimes with several spiny non-deciduous cornuti on top.

Female genitalia: Papilla anales narrow and long. Sterigma developed, short and broad. Ductus bursae sclerotized near ostium bursae. Corpus bursae globular, with two horned signa.

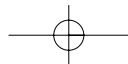
Distribution: Palaearctic and Oriental regions.

Notes: KAWABE & NASU (1994) proposed two autoapomorphies of *Gibberifera*: 1. forewing with a large whitish trapezoidal marking consisting of a wide median fascia and a large round ocellar patch, which occupies apical 4/5; 2. cucullus with a slender process on the ventral angle bearing a short spine apically. We agree with them according to our study. RAZOWSKI (1989) treated two characters, namely the process of cucullus (pollex) and the form of membrane connecting upper parts of basal process of valva, as supposed autoapomorphies. However, we did not recognize the latter character in this study.

Some species in *Gibberifera* have non-deciduous cornuti in the male genitalia, which are also found in the genera *Notocelia* Hübner and *Biuncaria* Kuznetsov. But there is no evidence that these similarities are due to synapomorphy.

Key to the Chinese species of *Gibberifera* based on male genitalia

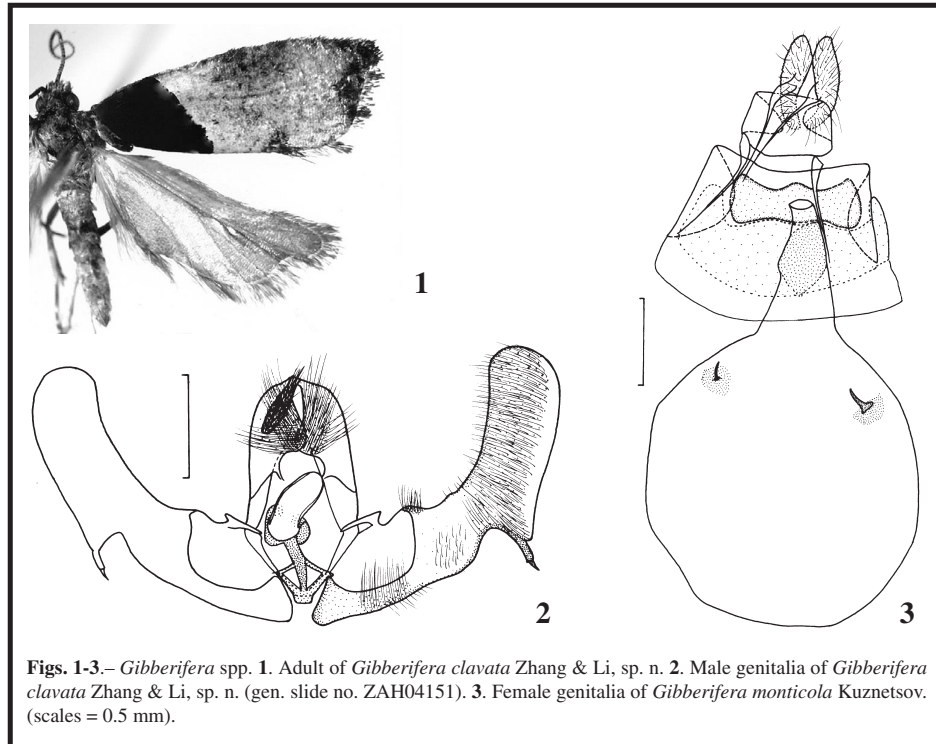
- | | |
|--|---|
| 1.- Cucullus oblong | 2 |
| Cucullus oval | 6 |
| 2.- Uncus bifurcated apically | 3 |
| Uncus not bifurcated apically | 4 |
| 3.- Aedeagus with one or two non-deciduous cornuti | <i>glaciata</i> (Meyrick) |
| Aedeagus without such cornuti | 5 |
| 4.- Aedeagus with two or more non-deciduous cornuti | <i>monticola</i> Kuznetsov |
| Aedeagus without non-deciduous cornuti | <i>clavata</i> Zhang & Li, sp. n. |
| 5.- Uncus bifurcated deeply, two arms in U-shape | <i>simplana</i> (Fischer v. Roeslerstamm) |
| Uncus bifurcated shallowly, two arms not in U-shape | <i>qingchengensis</i> Nasu & Liu |
| 6.- Aedeagus with non-deciduous cornuti | 7 |
| Aedeagus without non-deciduous cornuti | <i>yadongensis</i> Nasu & Liu |
| 7.- Aedeagus with two or three non-deciduous cornuti | <i>hepaticana</i> Kawabe & Nasu |
| Aedeagus with seven non-deciduous cornuti | <i>mienshana</i> Kuznetsov |



***Gibberifera clavata* Zhang & Li, sp. n. (Figs. 1-2)**

Holotype ♂, China: Motuo County (Medog) (29.13° N, 95.18° E), Xizang Autonomous Region (Tibet), alt. 3300 m, 8-VIII-2003, leg. Wang Xinpu and Xue Huaijun, genitalia slide no. ZAH04151. Paratypes: 2 ♂♂, same data as holotype.

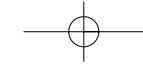
Male (Fig. 1): Wing expanse 15.0-17.0 mm. Vertex with greyish brown scales. Antenna brown. Labial palpus greyish brown, terminal segment slender. Thorax and tegula greyish brown. Forewing with ground colour light brown, termen brown; costa with seven pairs of strigulae from apex to basal 1/4; basal patch brown, extending from costal 1/4 to 2/5 of dorsum; median fascia light grey, originating from the sixth and seventh pairs of costal strigulae, reaching 3/4 of dorsum, its inner edge straight; ocellar patch large, oval; between median fascia and ocellar patch resting a small triangular dark spot on dorsum; cilia brown. Hindwing and cilia grey. Foreleg brown, midleg and hindleg grey, with brown scales on tarsi.



Male genitalia (Fig. 2): Uncus clubbed, unbifurcated apically, slightly dilated in median part; valva with neck about 2/3 width of its base; saccus angle blunt; cucullus oblong, bending inward; aedeagus narrow and long, with numerous deciduous cornuti (lost), but without non-deciduous cornuti.

Female: Unknown.

Diagnosis: This species is similar to *G. monticola* Kuznetsov, but can be distinguished by the male genitalia with saccus angle blunt and aedeagus without non-deciduous cornuti, while in the latter species saccus angle protruded and aedeagus with two or more non-deciduous cornuti.



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Etymology: The specific name is derived from the Latin *clavatus* = clubbed, in reference to uncus clubbed and unbifurcated apically in the male genitalia.

Gibberifera glaciata (Meyrick, 1907)

Cydia glaciata Meyrick, 1907, *J. Bombay nat. Hist. Soc.*, **18**: 143.

Eucosma glaciata (Meyrick, 1907), CLARKE, 1958, *Catalogue of the Type Specimens of Microlepidoptera in the British Museum (N. H.) described by Edward Meyrick*, **3**: 364.

Gibberifera simplana glaciata, DIAKONOFF, 1964, *Veröf. Zool. StSamml. Münch.*, **8**: 24.

Gibberifera glaciata (Meyrick, 1907), KAWABE & NASU, 1994, *Tyô to Ga*, **45**(2): 85; RAZOWSKI, 1999, *SHILAP Revta. lepid.*, **27**(108): 448; KUZNETSOV, 2001, in LER (ed.), *Key to the insects of Russian Far East*, **5**(3): 347; LIU & LI, 2002, *Fauna Sinica, Insecta*, **27**: 320.

Wing expanse 15.0-20.0 mm.

Specimens examined: 1 ♂, 3 ♀, Lijiang, Yunnan Province, alt. 2650 m, 17-VII-2001, leg. Li Houhun and Wang Xinpu 1 ♀, Weishan County, Yunnan Province, alt. 2200 m, 20-VII-2001, leg. Li Houhun and Wang Xinpu; 2 ♂ ♂, Sangzhi County, Hunan Province, alt. 1250 m, 13-VIII-2001, leg. Li Houhun and Wang Xinpu; 1 ♂, 1 ♀, Zhangjiajie, Hunan Province, alt. 650 m, 7-VIII-2001, leg. Li Houhun and Wang Xinpu; 5 ♂ ♂, 2 ♀ ♀, Bomi County, Xizang Autonomous Region, alt. 2800 m, 19-VIII-2003, leg. Wang Xinpu and Xue Huaijun; 1 ♂, 1 ♀, Neixiang County, Henan Province, alt. 1350 m, 14-VII-1998, leg. Li Houhun; 1 ♂, 1 ♀, Songxian, Henan Province, alt. 1580 m, 19-25-VII-2002, leg. Wang Xinpu; 6 ♂ ♂, 1 ♀, Yadong County, Xizang Autonomous Region, alt. 2950 m, 26-28-VIII-2003, leg. Wang Xinpu and Xue Huaijun; 16 ♂ ♂, 6 ♀ ♀, Linzhi County, Xizang Autonomous Region, 22-VI~31-VII-1983, leg. Li Houhun; 8 ♂ ♂, 3 ♀ ♀, Linzhi, Xizang Autonomous Region, alt. 2900 m, 6-VIII-2003, leg. Wang Xinpu and Xue Huaijun; 4 ♂ ♂, 1 ♀, Mt. Fanjing, Guizhou Province, alt. 1300 m, 2~3-VII-2001, leg. Li Houhun.

Food plant: *Salix* sp. (Salicaceae).

Distribution: China (Henan, Hunan, Sichuan, Guizhou, Yunnan, Xizang, Taiwan), Thailand, India, Nepal, Pakistan.

Remarks: DIAKONOFF (1964) treated it as a subspecies of *G. simplana* according to the resemblances of wing patterns and the genitalia. KAWABE & NASU (1994) upgraded it to a specific status based on the fact that it has bifurcated uncus and aedeagus has a non-deciduous cornutus. The male genitalia of this species is typically represented by uncus bifurcated shallowly or deeply and aedeagus with one or two non-deciduous cornuti. We also found in our study that the apophysis posterioris is slightly longer than apophysis anterioris in some females while in others the condition is just opposite.

Gibberifera hepaticana Kawabe & Nasu, 1994

Gibberifera simplana: KAWABE, 1982, in INOUE *et al.* (eds.), *Moths of Japan*, **1**: 122, **2**: 174. [Misid.]

Gibberifera hepaticana Kawabe & Nasu, 1994, *Tyô to Ga*, **45**(2): 89; RAZOWSKI, 1999, *SHILAP Revta. lepid.*, **27**(108): 448; KUZNETSOV, 2001, in LER (ed.), *Key to the insects of Russian Far East*, **5**(3): 347; LIU & LI, 2002, *Fauna Sinica, Insecta*, **27**: 321.

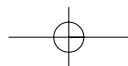
Wing expanse 12.0-18.0 mm.

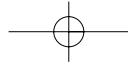
Specimens examined: 2 ♂ ♂, 2 ♀ ♀, Mt. Fanjing, Guizhou Province, alt. 2100 m, 30~31-VII-2001, leg. Li Houhun and Wang Xinpu; 5 ♂ ♂, 1 ♀, Jiangkou County, Guizhou Province, alt. 1700 m, 29-VIII-2001, leg. Li Houhun and Wang Xinpu.

Food plant: Unknown.

Distribution: China (Sichuan, Guizhou), Japan.

Remarks: KAWABE (1982) misidentified this species as *G. simplana* (Fischer v. Roeslertramm). It can be distinguished from *G. simplana* by uncus bifurcated shallowly, cucullus oval and aedeagus with two or three non-deciduous cornuti in the male genitalia; sterigma small, with acute latero-caudal angles in the female genitalia.



A SYSTEMATIC STUDY ON *GIBBERIFERA* OBRAZTSOV, 1946 FROM CHINA*Gibberifera mienshana* Kuznetsov, 1971

Gibberifera mienshana Kuznetsov, 1971, *Entomol. Obozr.*, **50**: 430; KUZNETSOV, 1976, *Trudy Zool. Inst. Leningr.*, **62**: 83; KAWABE & NASU, 1994, *Tyô to Ga*, **45**(2): 91; RAZOWSKI, 1999, *SHILAP Revta. lepid.*, **27**(108): 448; KUZNETSOV, 2001, in LER (ed.), *Key to the insects of Russian Far East*, **5**(3): 347.

Type material: Holotype ♂, deposited in MGAB (not examined). TL: Mianshan (Mien Shan), Shanxi Province (Shansi), China.

Food plant: Unknown.

Distribution: China (Shanxi), Russia (Far East).

Gibberifera monticola Kuznetsov, 1971 (Fig. 3)

Gibberifera monticola Kuznetsov, 1971, *Entomol. Obozr.*, **50**: 428; KAWABE & NASU, 1994, *Tyô to Ga*, **45**(2): 86; KUZNETSOV, 2001, in LER (ed.), *Key to the insects of Russian Far East*, **5**(3): 347.

Wing expanse 15.0-17.0 mm.

Female genitalia (Fig. 3): Apophysis posterioris as long as apophysis anterioris. Sterigma developed, its median part and two posterior angles protuberant. Ductus bursae broad and short, antrum about half of ductus bursae. Corpus bursae large, globular; two signa small, different in size.

Specimens examined: 4 ♂♂, 4 ♀♀, Jiuzhaigou, Sichuan Province, alt. 2250-2700 m, 13-19-VIII-2002, leg. Hao Shulian.

Food plant: Unknown.

Distribution: China (Sichuan, Yunnan).

Remarks: This species is similar to *G. simplana*, but differs in uncus unfurcated and aedeagus with two or more non-deciduous cornuti. While in *G. simplana* uncus bifurcated apically and aedeagus without non-deciduous cornuti. This is the first description of the female.

Gibberifera qingchengensis Nasu & Liu, 1996

Gibberifera qingchengensis Nasu & Liu, 1996, *Tinea*, **15**(1): 69; LIU & LI, 2002, *Fauna Sinica, Insecta*, **27**: 322.

Wing expanse 17.0 mm.

Specimens examined: Holotype (♂), paratypes (1 ♂, 3 ♀♀), deposited in IZCAS.

Additional specimens examined: 1 ♂, Chuishui, Guizhou Province, alt. 500 m, 3-VI-2000, leg. Du Yanli; 1 ♂, Jixian, Tianjin, alt. 550 m, 25-VI-2001, leg. Li Houhun *et al.*

Food plant: Unknown.

Distribution: China (Tianjin, Sichuan, Guizhou).

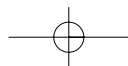
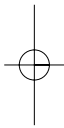
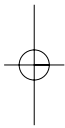
Remarks: This species is allied to *G. angkhangensis* (Kawabe & Nasu), but differs by sacculus without a setose lobe on the posterior edge of basal opening and aedeagus without non-deciduous cornuti, while the latter species possesses these two characters.

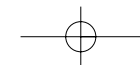
Gibberifera simplana (Fischer v. Roeslerstamm, 1835)

Penthina simplana Fischer v. Roeslerstamm, 1835, *Abbild. Ber. Schmett.-Kunde*: 38.

Semasia simplana: KENNEL, 1916, *Zoologica*, **21**: 489.

Gibberifera simplana (Fischer v. Roeslerstamm, 1835), OBRAZTSOV, 1946, *Z. wien. ent. Ges.*, **30**: 26; SWATSCHEK, 1958, *Abh. Larvalsyst. Insekten*: 155; KUZNETSOV, 1978, in G. S. MEDVDEV (ed.), *Keys to identification of the insects of the European part of USSR*, **4**(1): 478; BRADLEY *et al.*, 1979, *British Tortricid moths, Tortricidae: Olethreutinae*: 155; KAWABE, 1982, in H. INOUE *et al.* (eds), *Moths of Japan*, **1**: 122, **2**: 174; KAWABE & NASU, 1994, *Tyô to Ga*, **45**(2): 83; RAZOWSKI, 1987, *Monogr. Fauny Polski*, **15**: 143; BYUN *et al.*, 1998, *Illustrated Catalogue of Tortricidae in Korea (Lepidoptera)*, 165; RASOWSKI, 1999, *SHILAP Revta. lepid.*, **27**(108): 448; RAZOWSKI, 2001, *Die Tortriciden Mitteleuropas*, 73; KUZNETSOV,





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2001, in LER (ed.), *Key to the insects of Russian Far East*, 5(3): 347; LI & LI, 2002, *Fauna Sinica, Insecta*, 27: 322.

Wing expanse 12.0 mm.

Specimens examined: 1 ♂, Ningshan County, Shaanxi Province, alt. 880 m, 19-VI-1987, leg. Li Houhun; 1 ♂, Zhouzhi County, Shaanxi Province, alt. 1750 m, 20-VII-1987, leg. Li Houhun; 1 ♂ Fengxian, Shaanxi Province, alt. 1600 m, 9-VII-1988, leg. Li Houhun; 1 ♂, Tianshui, Gansu Province, 13-VIII-1988, leg. Wu Xingyu; 8 ♂ ♂, 7 ♀ ♀, Wufeng County, Hubei Province, alt. 1000-1100 m, 10-12-VII-1999, leg. Li Houhun *et al.*; 1 ♀, Hefeng County, Hubei Province, alt. 1260 m, 16-VII-1999, leg. Li Houhun *et al.*; 2 ♂ ♂, Tianshui, Gansu Province, 11-VII-1988, leg. Wu Xingyu; 1 ♂, 1 ♀, Songxian, Henan Province, alt. 1580 m, 19-25-VII-2002, leg. Wang Xinpu.

Food plants: *Populus tremula*, *Salix* sp. (Salicaceae).

Distribution: China (Hebei, Henan, Hubei, Hunan, Shaanxi, Gansu, Taiwan), Korea, Japan, Russia (Far East), Europe.

Remarks: This species is the type species of *Gibberifera* and the distinguished characters are noted in the remarks of other species.

Gibberifera yadongensis Nasu & Liu, 1996

Gibberifera yadongensis Nasu & Liu, 1996, *Tinea*, 15(1): 71; LIU & LI, 2002, *Fauna Sinica, Insecta*, 27: 323.

Specimens examined: Holotype (♂), paratype (1 ♀), deposited in IZCAS. TL: Yadong County, Xizang Autonomous Region (Tibet), China (examined).

Food plant: Unknown.

Distribution: China (Xizang).

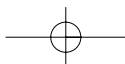
Remarks: This species is characterized by uncus slightly bifurcated at apex, cucullus oval and aedeagus without non-deciduous cornuti in the male genitalia.

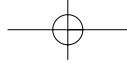
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