

ORIGINAL ARTICLE

Taxonomic review of the subfamily Schoenobiinae (Lepidoptera: Pyraloidea: Crambidae) from China

Fu-Qiang Chen, Chun-Sheng Wu*

Institute of Zoology, Chinese Academy of Sciences, Beijing 100101; China. E-mail: chenfq@ioz.ac.cn

*Corresponding author, E-mail: wucs@ioz.ac.cn

Abstract The taxonomy of the Chinese Schoenobiinae is revised. In total, 12 genera and 49 species are recognized. This paper presents keys to the genera and species, illustrations of wing venation for each genus, and line drawings of genitalia of most species. Two new species, namely, *Schoenobius scirpus* **sp.nov.** and *Ramila minima* **sp.nov.**, are described. The female of *Scirpophaga adunctella* Chen, Song, and Wu, 2006 is reported for the first time. *Donacaula forficellus* (Thunberg, 1794) reported by Wang (1980) is proven to be a misidentification of *S. scirpus* **sp.nov.** The diagnostic characteristics of Schoenobiinae and the taxonomic status of some genera are discussed. *Acropentias*, *Leechia*, *Brihaspa*, and *Promacrochilo* are suggested to be removed from the subfamily because these genera do not share any synapomorphic characters with Schoenobiinae.

Key words Lepidoptera, Crambidae, Schoenobiinae, taxonomy, new species.

1 Introduction

Schoenobiinae is a relatively small group of Crambidae with cosmopolitan distribution (Heppner, 1991). To date, approximately 201 species in 29 genera have been described (Heppner, 1991; Beccaloni *et al.*, 2003; Nuss *et al.*, 2003–2014; Regier *et al.*, 2012). Among these species, more than 40 are recorded from China (Lu & Guan, 1953; Wang, 1980; Chen *et al.*, 2007).

Schoenobiine moths are commonly found in wetlands, especially in paddy fields (Wang, 1980). Some species, including those from *Scirpophaga* and *Rupela*, are considered important pests of crops (Munroe & Solis, 1999). Most schoenobiine larvae bore in stems of Poaceae and Cyperaceae, such as *Oryza sativa*, *Eleocharis dulcis*, and *Saccharum* spp. Their feeding habits may cause spike topping, dead hearting, or white heading of host plants, thereby leading to great crop loss (Wang, 1980). For example, in China, yellow stem borer, *Scirpophaga incertulas* (Walker, 1863) outbreaks and recurrences were reported in the middle of the last century and end of the last century, respectively, causing 5% to 10% yield loss in rice crops (Wang, 1980; Ye & Lei, 2006).

Schoenobiinae has been investigated for many years. In 1844, Duponchel erected the family Schoenobidae for the genera *Schoenobius* Duponchel, 1836, *Scirpophaga* Treitschke, 1832 and *Chilo* Zincken, 1817. However, this family was not generally accepted (Meyrick, 1885, 1890). Ragonot (1891) downgraded Schoenobidae to the subfamily status of the family Pyralidae, including *Scirpophaga*, *Schoenobius* and *Donacaula*. Hampson (1895–1919) first attempted to classify Schoenobiinae. He separated the group from Crambinae by the absence of proboscis on the head and presence of a cubital pecten on the hindwing. He also attempted to solve classification issues of Schoenobiinae. In his work, 25 genera were listed under Schoenobiinae (only 11 genera were proven to be real schoenobiines by Fletcher and Nye (1984)). Hampson

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(1919) changed the group name from Schoenobiinae to Siginae as *Siga* Hübner [1820] had priority. Caradja (1925, 1932), de Joannis (1927, 1929), and Marumo (1934) followed this treatment. However, Forbes (1926) pointed out that *Siga* is actually a pyraustine, and revalidated the name of Schoenobiinae. He mentioned that the presence of vein 1A (CuP in present work) at the outer margin of the forewing can distinguish Schoenobiinae from other subfamilies. Munroe (1956) supported Forbes' opinion, clarified information on Schoenobiinae, and listed 24 genera under this subfamily. Lewvanich (1981a) studied *Scirpophaga* and summarized the traits of Schoenobiinae. She pointed out that the group is characterized by the presence of CuP and coremata, reduced proboscis, and elongated, lobe-like papillae anales. Munroe and Solis (1999) and Speidel (2005) also discussed the diagnosis of Schoenobiinae. Solis and Maes (Solis & Maes, 2002; Solis, 2007) conducted a cladistic analysis of crambid relationships based on adult morphology only. In their studies, the subfamily Schoenobiinae was treated as monophyletic. Regier *et al.* (2012) agreed with this hypothesis, although molecular phylogenetic work showed an ambiguous Schoenobiinae. They concluded multiple morphological synapomorphies proposed for Schoenobiinae: presence of a prothoracic membranous sac in the larva; deep, pit-like mesothoracic spiracle, and exposed mesothoracic and metathoracic coxae in the pupa; anal tuft encircling abdominal segment VII in the adult female; presence of a scale tuft medially on the apical margin of sternites VII and VIII; and presence of A2 pleural tubercles on S2 sclerite and subteguminal processes. Taxonomic studies on Schoenobiinae are currently underway; new taxa have been reported from China, Japan, Thailand, Australia, Southeast Asia, and so on (Marumo, 1934; Common, 1960; Wang *et al.*, 1978; Wang & Sung, 1979; Lewvanich, 1981b; Inoue, 1982; Wang *et al.*, 1986; Yamanaka & Yoshiyasu, 1992; Ahmad & Kamaluddin, 1994; Robinson *et al.*, 1994; Sasaki, 1994; Inoue, 1995; Maes, 1996; Yamanaka, 1998; Maes, 2002).

In China, study on Schoenobiinae began in the 1920s. Caradja and Meyrick (Caradja, 1925, 1938; Caradja & Meyrick, 1933–1937) reported some species from Fujian, Guangdong, Zhejiang, Yunnan and Gansu Provinces in China based on the collection of A. Caradja. The collection was sold to several European museums, mainly to the “Grigore Antipa” National Museum of Natural History of Romania. Lu and Guan (Luh & Kuan, 1950; Lu & Guan, 1953) revised the catalog of the Pyralidae *sensu lato* of China based on the studies of former entomologists (Wu, 1938); this catalog includes 10 genera and 29 species under the subfamily Schoenobiinae. Wang *et al.* (Wang *et al.*, 1978; Wang & Sung, 1979; Wang, Li & Chen, 1986) continued research on Schoenobiinae. In the book *Economic Insect Fauna of China, Fasc. 21, Lepidoptera: Pyralidae*, Wang (1980) redescribed 7 genera and 14 species under the subfamily Schoenobiinae.

Since 2006, several publications on Schoenobiinae in China have been published (Chen, *et al.*, 2006a, b, 2007a, b). As of this writing, 12 genera have been reported under Schoenobiinae in China, namely: *Scirpophaga* Treitschke, 1832; *Schoenobius* Duponchel, 1836; *Catagela* Walker, 1863; *Niphadoses* Common, 1960; *Donacaula* Meyrick, 1890; *Patissa* Moore, 1886; *Ramila* Moore, 1867; *Archischoenobius* Speidel, 1984; *Promacrochilo* Bleszynski, 1962; *Brihaspa* Moore, 1867; *Leechia* South, 1901 and *Acropentias* Meyrick, 1890. The present work provides a taxonomic revision of the Chinese Schoenobiinae. Redescriptions of the subfamily and genera are provided in this paper. A total of 49 species of Schoenobiinae are reportedly distributed in China. Keys to genera and species, illustrations of the wing venation for the genera, and genitalia illustrations for most species are provided. Photos of adults for most species are also provided. Two species are described as new to science, namely, *Schoenobius scirpus* **sp.nov.** and *Ramila minima* **sp.nov.** The female of *Scirpophaga adunctella* Chen *et al.*, 2006 is reported here for the first time. *Schoenobius forficellus* (Thunberg, 1794) (now in *Donacaula* Meyrick, 1890) in Wang (1980) is reported as a misidentification of *S. scirpus* **sp.nov.**

2 Materials and methods

Over 2000 specimens were rechecked in this study. Materials examined and all type specimens are deposited in the Institute of Zoology, Chinese Academy of Sciences (IZCAS). Specimens were collected by UV-VIS light traps, net-catching, and artificial feeding, or providing by a local plant protection department.

The types of following species were revised by photos from the Natural History Museum, London (BMNH): *Schoenobius micralis* Hampson, 1919; *Patissa virginea* (Zeller, 1852); *P. nigropunctata* Wileman & South, 1918; *Leechia sinuosalis* South, 1901; *Leechia bilinealis* South, 1901; and *Ramila angustifimbrialis* (Swinhoe, 1890).

The images of adults were captured using Canon-EOS-7D equipped with a Canon EF-100 mm macrolens. Illustrations of the venations and genital structures were drawn with the help of a camera lucida, and post-corrected with Adobe Photoshop®. Terms for morphological and genital structures follow Lewvanich (1981a).

3 Taxonomy

Schoenobiinae Duponchel, 1844

Schoenobidae Duponchel, 1844. *Cat. Meth. Lepid. Euro.*, 1844: 311. Type genus: *Schoenobius* Duponchel, 1836. *Hist. Nat. Lepid. Fr.*, 10: 8, 22.

Schoenobiinae: Ragonot, 1891. *Ann. Soc. Ent. Fr.*, 1891: 455.

Diagnosis. The subfamily can be diagnosed by the reduction of proboscis, the presence of vein CuP on the forewing, the scale-tuft on the seventh abdominal sternite and the coremata in male.

Redescription of Schoenobiinae (Common, 1960; Lewvanich, 1981a; Wang, 1980; Chen *et al.*, 2006–2007). Head. Frons usually round. Compound eyes large and round. Two ocelli present at posterior area of antennae. Chaetosema present at posterior area of ocelli. Antennae filiform and ciliated, weakly serrated, thinner in female than that in male. Proboscis always reduced. Labial and maxillary palpi well developed, usually porrect. Length of labial palpi variable between species, about 1–4 times as long as the diameter of compound eyes. Labial palpi with three segments, the second segment the longest. Maxillary palpi with four segments, usually expanded at apex.

Key to genera of Schoenobiinae in China

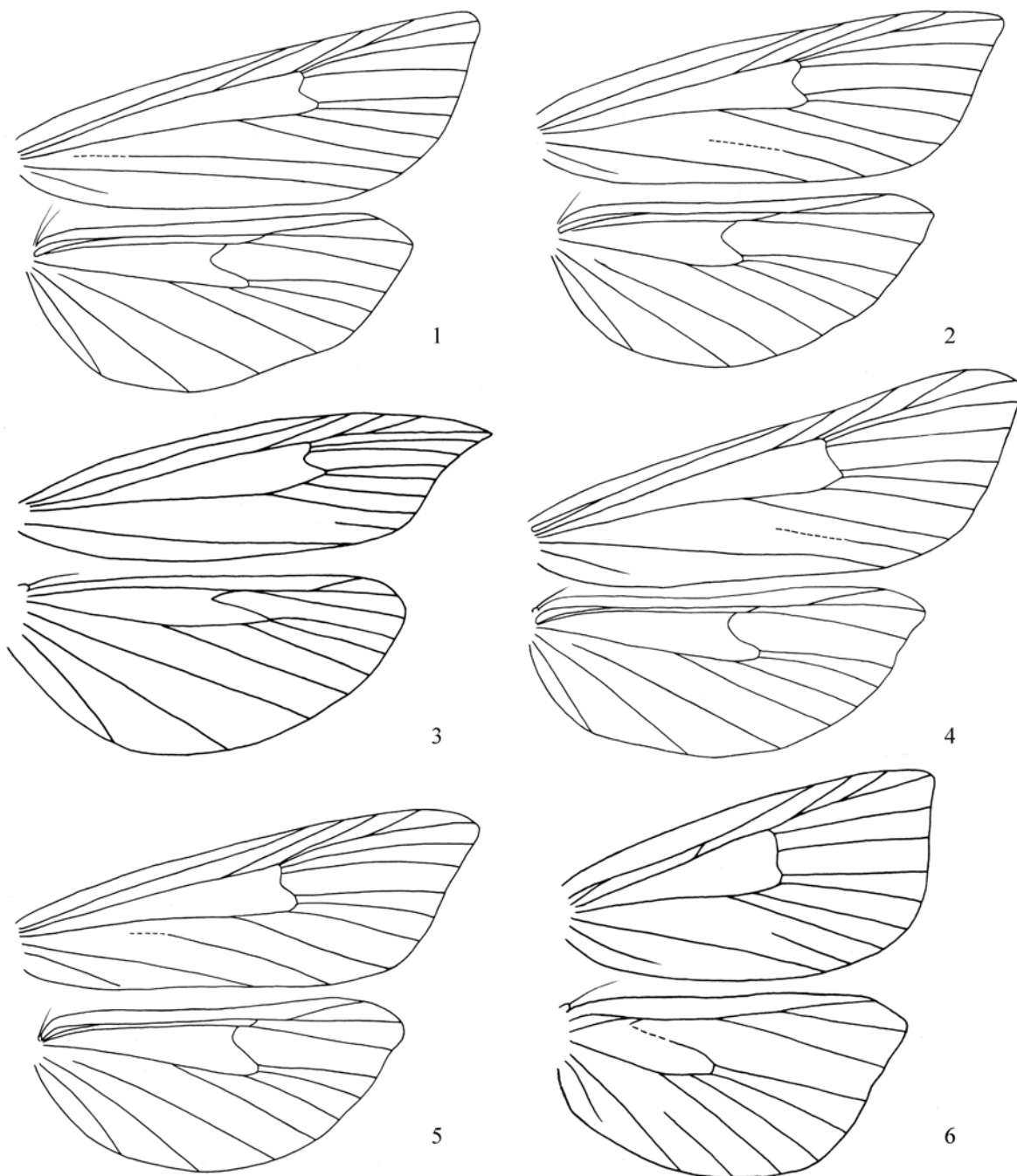
1. Forewing with vein R_1 separate from other radial veins. Male genitalia with gnathos present 2
Forewing with vein R_1 stalked with other radial veins. Male genitalia with gnathos absent 11
2. Gnathos of male genitalia similar to uncus in shape, usually beaked 3
Gnathos of male genitalia semicircular, uncus beaked 10
3. Both wings usually without fascia; forewing sometimes with an oblique line from apex to inner margin 4
Both wings with distinct fasciae; forewing not as above 8
4. Forewing with R_2 stalked with R_{3+4} , female with apex strongly pointed *Donacaula* 5
Forewing with R_2 not stalked with R_{3+4} , female with apex relatively blunt 5
5. Juxta of male genitalia extremely elongated apically, the elongated part much longer than the basal part *Catagela* 6
Juxta of male genitalia plate-like or pyriform 6
6. Juxta of male genitalia pyriform, the apex raised *Schoenobius* 7
Juxta of male genitalia plate-like, the apex flat or curved 7
7. Forewing usually white. In male genitalia, valva not constricted apically, or valva constricted apically but tegumen with triangular dorsal ridge *Scirpophaga* 8
Forewing white to fuscous. In male genitalia, valva constricted apically and tegumen with X-shaped dorsal ridge *Niphadoses* 8
8. Vein Sc and R_1 of forewing not anastomosed, radial vein and M_1 of hindwing not stalked. Both wings with complex fasciae, hindwing with a series of black metallic spots on outer margin *Archischoenobius* 9
Vein Sc and R_1 of forewing anastomosed, radial vein and M_1 of hindwing stalked. Both wings with simple fasciae, hindwing without black metallic spots on outer margin 9
9. Frons of head not porrect and peltate. Forewing with apex blunt, R_2 stalked with R_{3+4} , R_5 from the upper angle of cell *Patissa* 10
Frons of head porrect, peltate. Forewing with apex pointed, R_2 stalked with R_{3+4+5} , R_{3+4} stalked with R_5 *Ramila* 10
10. Forewing with Sc and R_1 anastomosed, but separated apically, R_{2+3+4} and R_5 not stalked *Brihaspa* 11
Forewing with Sc and R_1 not anastomosed, R_{2+3+4} and R_5 shortly stalked *Promacrochilo* 11
11. Forewing with all radial veins stalked, M_2 and M_3 long stalked; hindwing with M_2 and M_3 stalked *Leechia* 12
Forewing with R_1 to R_4 stalked, R_5 from the upper angle of cell, M_2 and M_3 shortly stalked; hindwing with M_2 and M_3 not stalked ..
..... *Acropentias* 12

Thorax. Patagia thin, lobe-like. Mesoscutum and mesoscutellum large and prominent, with a tegula at base of forewing. Metascutum and postnotum small. Legs relatively long. Forelegs with an epiphysis at middle of tibiae. Midlegs with a pair of spurs at apex of tibiae, the inner spur shorter. Hindlegs with two pair of spurs at middle and apex of tibiae. Tarsi with five segments, apical segment with a pair of claws.

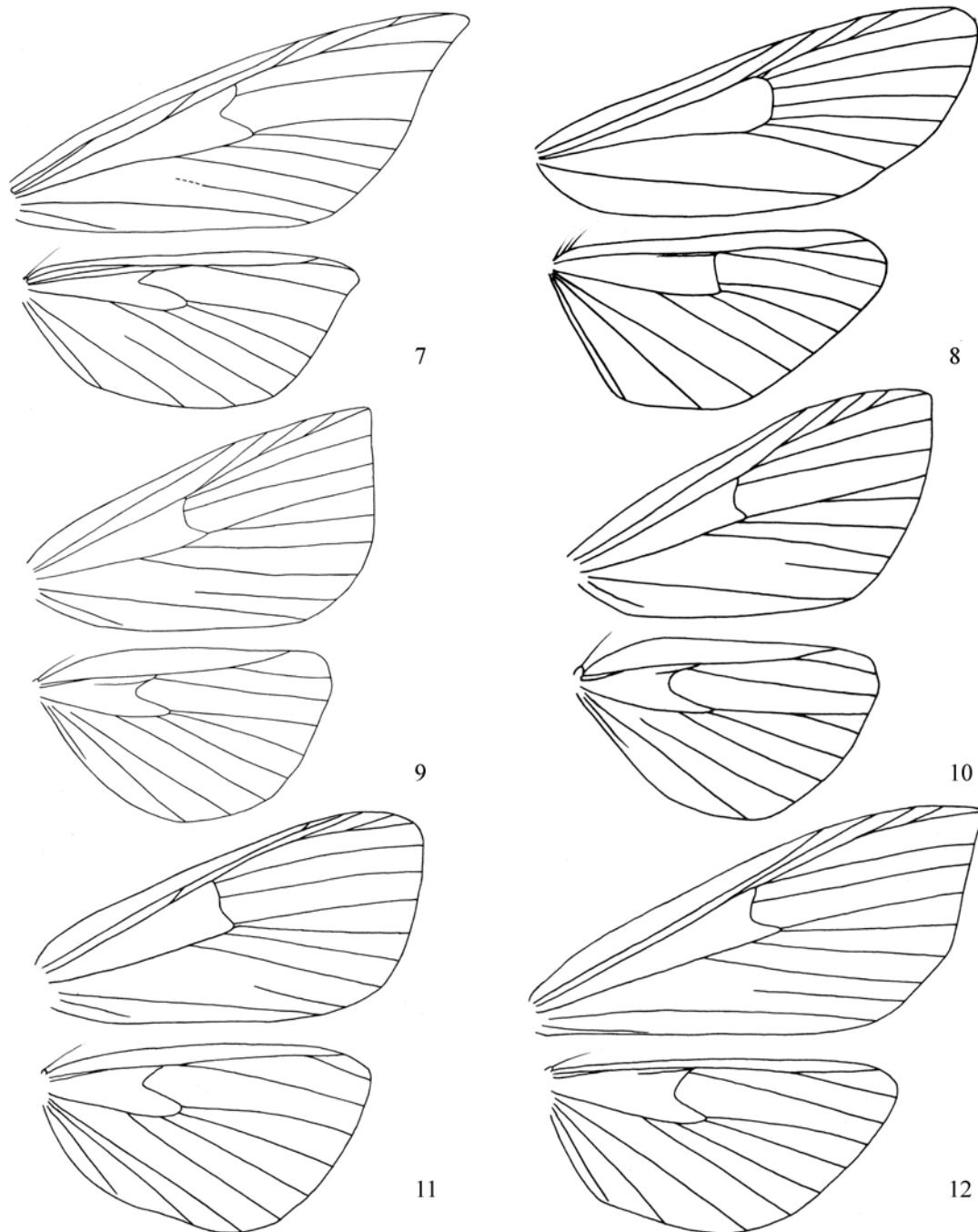
Abdomen. Slender. Tympanal organ present at base of abdomen. Male usually with a scale-tuft on posterior area of the seventh sternite, extending over the eighth sternite. Female of some genera with anal tuft on the seventh segment used for covering eggs during oviposition.

Wing patterns. Forewing slender, with ground color from white to fuscous, without fascia or only with simple fasciae except in genus *Archischoenobius*.

Venation (Figs 1–12). On forewing, Sc and R₁ close or anastomosed; R₂ and R₅ usually from upper angle of cell, sometimes stalked with R₃₊₄; M₁ close to R₅; M₂ and M₃ usually from lower angle of cell; Cu₁ and Cu₂ before lower angle of cell; CuP present at distal area. On hindwing, upper margin of cell usually strong; Sc+R₁ and Rs stalked, diverging from upper angle of cell as M₁ or stalked with M₁; M₂, M₃, Cu₁ and Cu₂ the same as forewing. Hindwing with one frenulum in male, while 1–2 in female.



Figs 1–6. Venations. 1. *Scirpophaga*. 2. *Schoenobius*. 3. *Donacaula*. 4. *Catagela*. 5. *Niphadoses*. 6. *Patissa*.



Figs 7–12. Venations. 7. *Ramila*. 8. *Archischoenobius*. 9. *Acropentias*. 10. *Leechia*. 11. *Brihaspa*. 12. *Promacrochilo*.

Male genitalia. Uncus simple and tapering; gnathos usually simple and slender, sometimes with dorsal teeth at apex; tegumen often with various subteguminal process and sclerotized dorsal ridge; valva simple, seldom with appendant process; juxta plate-like or elongated, various in different species; aedeagus usually with one or more cornuti; coremata specialized, taking a form of plate-like structure, with long thread-like scales at the base. The coremata seems operate together with the scale-tuft at the posterior area of the seventh sternite for some unknown function.

Female genitalia. Anal papillae elongated, lobe-like, with strong setae; apophyses anterioris and posterioris well

developed, long and slender; ostium bursae and ductus bursae various due to different species; corpus bursae membranous or lined with minute spines; signa usually absent, sometimes present.

Remarks. Three genera, *Scirpophaga*, *Patissa* and *Archischoenobius*, which were reported in former works (Chen *et al.*, 2006b, 2007a, b), are simply described here.

3.1 *Scirpophaga* Treitschke, 1832 (Figs 1, 2–49, 51–60)

Scirpophaga Treitschke, 1832. *Die Schmetterlinge von Europa*, 9(1): 55; Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 195; Chen, Song & Wu, 2006. *Zootaxa*, 1236: 2. Type species: *Tinea phantasmata* Hübner, 1796, by monotypy (misspelled *Tinea phantasmella* by Treitschke; junior synonym of *Phalaena praelata* Scopoli, 1763).

Apurima Walker, 1863. *List Specimens Lipid. Insects Colln Br. Mus.*, 28: 194; Hampson, 1895. *Proc. Zool. Soc. Lond.*, 1895: 912. Type species: *Apurima xanthogastrella* Walker, 1863, by monotypy.

Tryporyza Common, 1960. *Aust. J. Zool.*, 8: 339; Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 196. Type species: *Tipanaea innotata* Walker, 1863, by original designation.

Keys to species of *Scirpophaga* in China

Based on male genitalia

1. Tegumen with sclerotized dorsal ridge rectangular; subteguminal process flattened, plate-like (*praelata* group) 2
Tegumen with sclerotized dorsal ridge triangular or more or less X-shaped; subteguminal process lobe-like or spine-like 6
2. Subteguminal process with smooth margin; aedeagus with four cornuti, one slender and three stout *S. parvalis*
Subteguminal process with sinuous margin; aedeagus with two or three cornuti 3
3. Aedeagus with two cornuti, the larger one with a bifid tip *S. humilis*
Aedeagus with three cornuti, two larger, the other smaller 4
4. Aedeagus strongly swollen in apical 1/3, one slender and two stout cornuti present *S. praelata*
Aedeagus slightly swollen in apical 1/3, one slender and two long-based cornuti present 5
5. Largest cornutus with bifid tip *S. xanthopygata*
Largest cornutus without bifid tip *S. nivella*
6. Tegumen with sclerotized dorsal ridge triangular 7
Tegumen with sclerotized dorsal ridge X-shaped or near X-shaped 10
7. Aedeagus with two or more cornuti 8
Aedeagus without cornutus (*lineata* group) 9
8. Subteguminal process a bifid spine; aedeagus with two adjacent curved cornuti (*incertulas* group) *S. incertulas*
Subteguminal process lobe-like; aedeagus with a group of curved cornuti (*whalleyi* group) *S. whalleyi*
9. Subteguminal process with posterior margin produced to form a spine *S. auristrigella*
Subteguminal process rectangular *S. lineata*
10. Subteguminal process more or less spine-like or tubercle-like (*excerptalis* group) 11
Subteguminal process lobe-like 18
11. Manica with minute spinules apically *S. xanthogastrella*
Manica with two groups of strong spines 12
12. Aedeagus strongly swollen apically, cornuti present 13
Aedeagus not swollen, cornutus absent 14
13. Subteguminal process tuberculate, aedeagus with one cornutus *S. flavidorsalis*
Subteguminal process lobe-like and weakly hooked, aedeagus with three cornuti *S. linguatella*
14. Subteguminal process spine-like, strongly sclerotized 15
Subteguminal process tuberculate or weakly sclerotized hooked 17
15. Uncus broad, tegumen with sclerotized dorsal ridge in two lines with tendency to join *S. tongyaii*
Uncus slender, tegumen with sclerotized dorsal ridge X-shaped 16
16. Subteguminal process with a long spine *S. excerptalis*
Subteguminal process with a short spine *S. magnella*
17. Subteguminal process tuberculate *S. khasis*
Subteguminal process lobe-like, hooked *S. aduncella*
18. Juxta without spines (*gotoi* group) *S. gotoi*
Juxta with two dense, strongly sclerotized spines (*occidentella* group) 19
19. Subteguminal process round *S. virginia*
Subteguminal process bilobed *S. fusciflua*

Based on female genitalia

1. Antrum present and strongly sclerotized (*praelata* group)..... 2
Antrum absent..... 6
2. Antrum with a separate sclerotized tip..... *S. nivella*
Antrum not as above..... 3
3. Antrum with constricted middle..... *S. parvalis*
Antrum with middle not constricted..... 4
4. Ductus bursae long and slender, about two times the diameter of corpus bursae..... *S. xanthopygata*
Ductus bursae short and broad, little longer than the diameter of corpus bursae..... 5
5. Frenulum single-bristled, anal tuft yellow..... *S. humilis*
Frenulum double-bristled, anal tuft grayish white..... *S. praelata*
6. Corpus bursae all or partly with dense spines..... 7
Corpus bursae membranous, without minute spines..... 15
7. Ostium bursae wrinkled or sclerotized..... 8
Ostium bursae membranous, not wrinkled or sclerotized..... 14
8. Corpus bursae usually lined with dense spines in the basal 3/4 (*incertulas* group)..... *S. incertulas*
Corpus bursae all lined with dense spines (*excerptalis* group)..... 9
9. Ostium bursae strongly wrinkled or sclerotized; ductus bursae between ostium bursae and ductus seminalis not constricted..... 10
Ostium bursae weakly wrinkled; ductus bursae between ostium bursae and ductus seminalis strongly constricted.....
..... *S. xanthogastrella*
10. Ductus bursae between ostium bursae and ductus seminalis lined with annulated sclerotized plates..... *S. tongyaii*
Ductus bursae between ostium bursae and ductus seminalis lined with sclerotized plates not annulated..... 11
11. Ostium bursae with the length longer than the width..... 12
Ostium bursae with the width longer than the length..... 13
12. Ostium bursae strongly sclerotized nearby ductus bursae; ductus bursae slender..... *S. adunctella*
Ostium bursae weakly sclerotized nearby the ductus bursae; ductus bursae broad..... *S. flavidorsalis*
13. Ostium bursae strongly wrinkled and sclerotized..... *S. excerptalis*
Ostium bursae strongly wrinkled but not sclerotized..... *S. magnella*
14. Ductus bursae with sclerotized plate throughout (*gotoi* group)..... *S. gotoi*
Ductus bursae membranous, the section between ostium bursae and ductus seminalis with sclerotized plates (*lineata* group).....
..... *S. lineata*
15. Ductus seminalis arising from ostium bursae (*occidentella* group)..... *S. virginia* & *S. fusciflua*
Ductus seminalis arising from ductus bursae (*whalleyi* group)..... *S. whalleyi*

Diagnosis. The genus is distinguishable from other genera by the forewing having the fascia absent or only an oblique line present from apex to inner margin. It is different from *Schoenobius* by the juxta of male plate-like and the apex not elongated, and from *Niphadoses* by the valva not constricted apically. More information can be seen in the discussion under the genera closely related to *Scirpophaga*.

Distribution. Oriental, Palearctic, Australian and African Regions.

Remarks. The genus has about 40 species reported. Lewvanich (1981a) revised the genus from the Old World. Chen *et al.* (2006b) revised the Chinese species, in which 20 species were reported from China. The differences among the species groups and allied genera see Table 1 and 2 (Discussion part)

3.1.1 praelata group***Scirpophaga praelata* (Scopoli, 1763)** (Figs 13, 21, 29)

Phalaena praelata Scopoli, 1763. *Ent. Carniolica, Exhibens Ins. Carnioliae Indigena*: 198. Type locality: Slovenia, Carniola.

Tinea dubia Rossi, 1790. *Fauna Etrusca, Sistens Ins., Quae provinciae Florentinae Pisanae Praesertim Collegit*, 2: 208.

Phalaena Alucita latidactyla Hübner, 1790. *Beitr. Geschichte Schmetterlinge*, 2: 27.

Tinea phantasmatella Hübner, 1796. *Sammlung Europäischer Schmetterlinge*, 8: 23.

Bombyx alba Hübner, 1828. *Sammlung Europäischer Schmetterlinge*, 3: 74.

Scirpophaga phantasmella Treitschke, 1832. *Die Schmetterlinge Europa*, 9(1): 56.

Scirpophaga phantasmella var. *grisea* Guenée, 1845. *Annls Soc. Ent. Fr.*, (2)3: 334.

Scirpophaga cinerea Zeller, 1863. *Chilonidarum et Crambidarum Genera et Species*: 1.

Scirpophaga limnochares Common, 1960. *Aust. J. Zool.*, 8:318.

Scirpophaga praelata: Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 205; Wang, 1980. *Economic Insect Fauna of China*, 21: 56.

Description. Body ochreous white. Length of labial palpi about 1.2 times the diameter of compound eyes. Both wings ochreous white, without fascia. Female with anal tuft grayish white. In male genitalia, subteguminal process with sinuous margin; aedeagus strongly swollen in apical 1/3, one slender and two stout cornuti present. In female genitalia, antrum a completely irregular plate; ductus bursae relatively short, slightly longer than the diameter of corpus bursae.

Distribution. China (Heilongjiang, Neimenggu, Beijing, Hebei, Henan, Jiangsu, Anhui, Hunan, Fujian, Taiwan, Yunnan); Russia, Japan, Iran, Syria, Lebanon, Turkey, Greece, Bulgaria, Rumania, Czech, Slovakia, Hungary, Slovenia, Austria, Italy, France, Spain, Morocco, Algeria, Australia.

***Scirpophaga xanthopygata* Schawerda, 1922** (Figs 14, 22, 30)

Scirpophaga praelata var. *xanthopygata* Schawerda, 1922. *Z. Öst. EntVer.*, 7: 11. Type locality: Russia.

Scirpophaga xanthopygata: Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 209.

Description. Body ochreous white. Length of labial palpi about 1.2 times the diameter of compound eyes. Both wings ochreous white, without fascia. Female with anal tuft pale ochreous yellow. In male genitalia, subteguminal process with sinuous margin; aedeagus slightly swollen in apical 1/3, one slender and two stout long-based cornuti present, the largest one with bifid tip. In female genitalia, antrum a whole plate, pyriform; ductus bursae relatively long, about 2 times the diameter of corpus bursae.

Distribution. China (Heilongjiang, Neimenggu, Beijing, Gansu, Shanghai, Jiangsu, Anhui, Zhejiang, Jiangxi, Hunan, Fujian, Taiwan, Guangdong, Hainan, Guangxi, Yunnan); Russia, Japan, Korea, Vietnam.

***Scirpophaga nivella* (Fabricius, 1794)** (Figs 15, 23, 31)

Tinea nivella Fabricius, 1794. *Ent. Syst. Emendata Aucta*. 3(2): 296. Type locality: India.

Scirpophaga chrysorrhoea Zeller, 1863. *Chilonidarum Crambidarum Genera Species*: 1.

Scirpophaga auriflua Zeller, 1863. *Chilonidarum Crambidarum Genera Species*: 2.

Scirpophaga brunnescens Moore, 1888. In: Hewitson & Moore, *Descr. New Indian Lepid. Insects Colln late Mr W.S. Atkinson*, 3: 225.

Schoenobius celidias Meyrick, 1894. *Trans. Ent. Soc. Lond.*, 1894: 475.

Scirpophaga euclastalis Strand, 1918. *Stettin. Ent. Ztg.*, 79: 262.

Tryporyza nivella: Wang, 1980. *Economic Insect Fauna of China*, 21: 63.

Scirpophaga nivella: Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 211.

Description. Body ochreous. Length of labial palpi about 1.2 times the diameter of compound eyes. Male with forewing ochreous white, sometimes a fuscous spot present at the lower angle of cell; hindwing white. Female with both wings ochreous white and anal tuft ochreous yellow. In male genitalia, subteguminal process with sinuous margin; aedeagus slightly swollen in apical 1/4, one slender and two long-based cornuti present. In female genitalia, antrum with a separated sclerotized tip; ductus bursae with the section between corpus bursae and ductus seminalis annulated and broader in diameter than the section between ostium bursae and ductus seminalis.

Distribution. China (Henan, Shanghai, Jiangsu, Zhejiang, Jiangxi, Fujian, Taiwan, Guangdong, Hainan, Hong Kong, Guangxi, Yunnan); India, Nepal, Bangladesh, Sri Lanka, Andaman Islands, Myanmar, Thailand, Vietnam, West Malaysia, Singapore, Philippines, Sumatra, Java, Borneo, Timor, Aru Island, New Guinea, Australia, New Caledonia, Fiji.

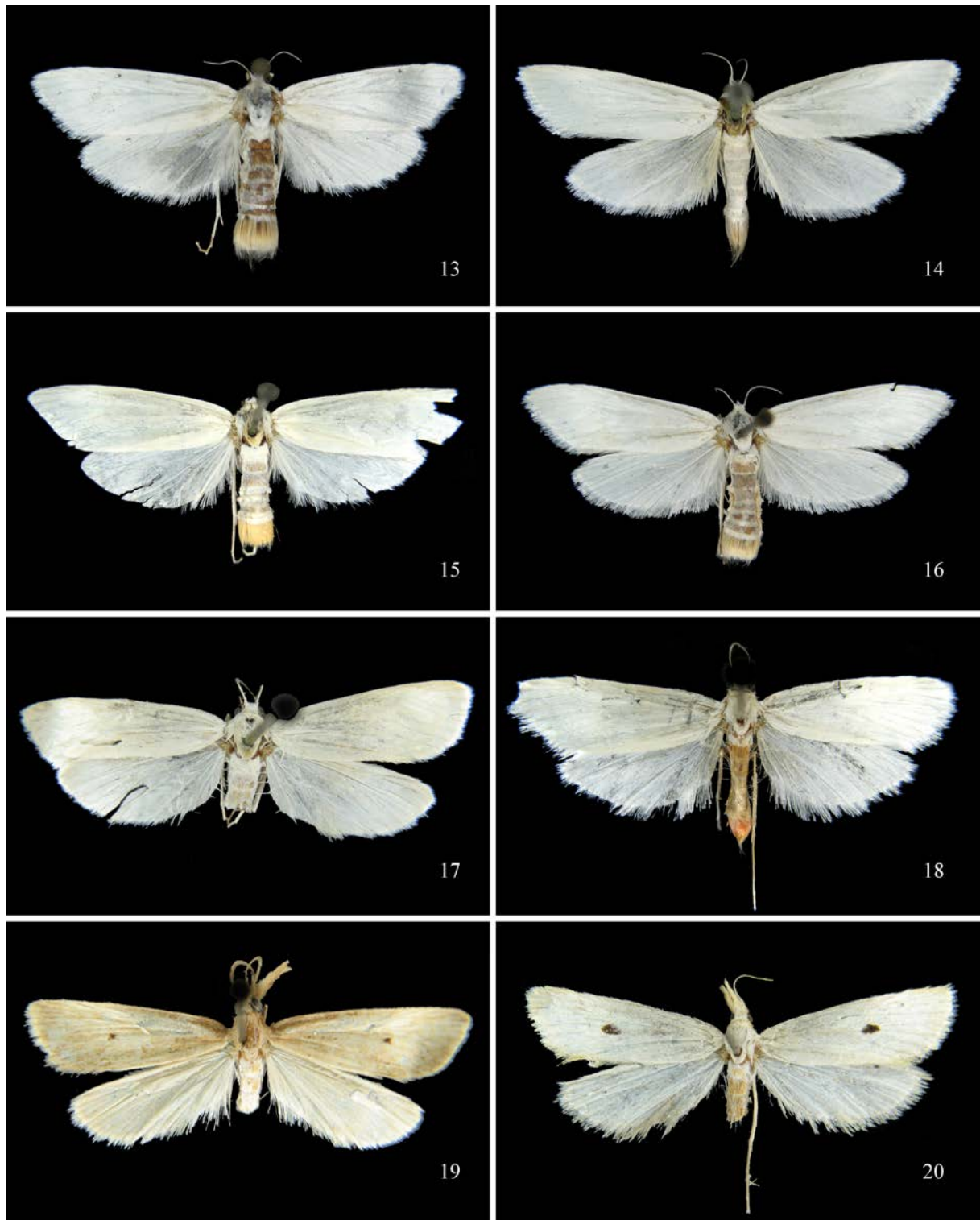
***Scirpophaga parvalis* (Wileman, 1911)** (Figs 16, 24, 32)

Schoenobius costalis var. *parvalis* Wileman, 1911. *Trans. Ent. Soc. Lond.*, 1911: 355. Type locality: Japan.

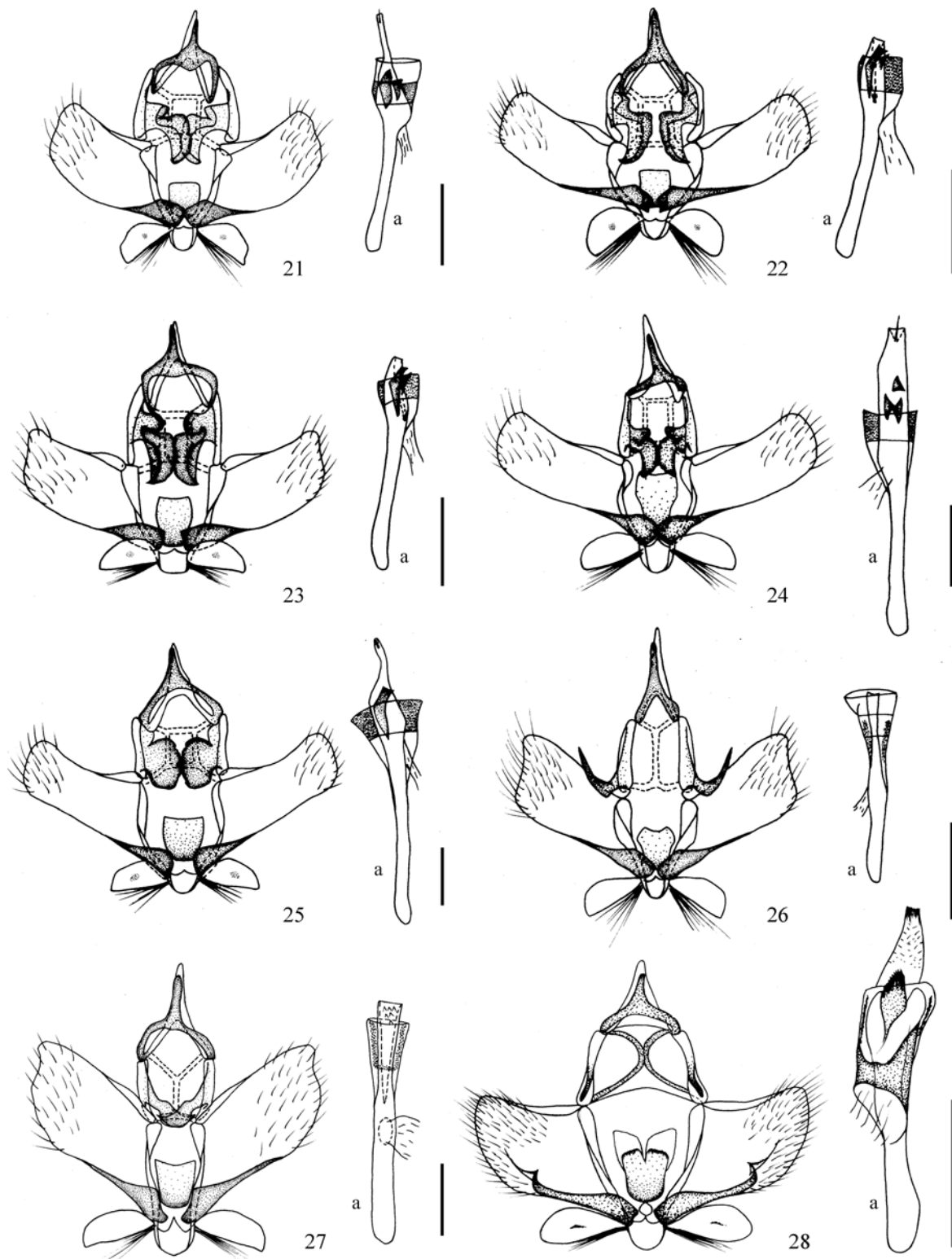
Scirpophaga parvalis: Shibuya, 1931. *Insect World*, 35: 368; Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 214.

Description. Body pale ochreous white. Length of labial palpi about 1.2 times the diameter of compound eyes. Both wings white, without fascia. Female with anal tuft white. In male genitalia, subteguminal process with smooth margin; aedeagus swollen in apical 1/3, one slender and three stout cornuti present. In female genitalia, antrum broad, constricted in middle; ductus bursae relatively short, a little longer than the diameter of corpus bursae.

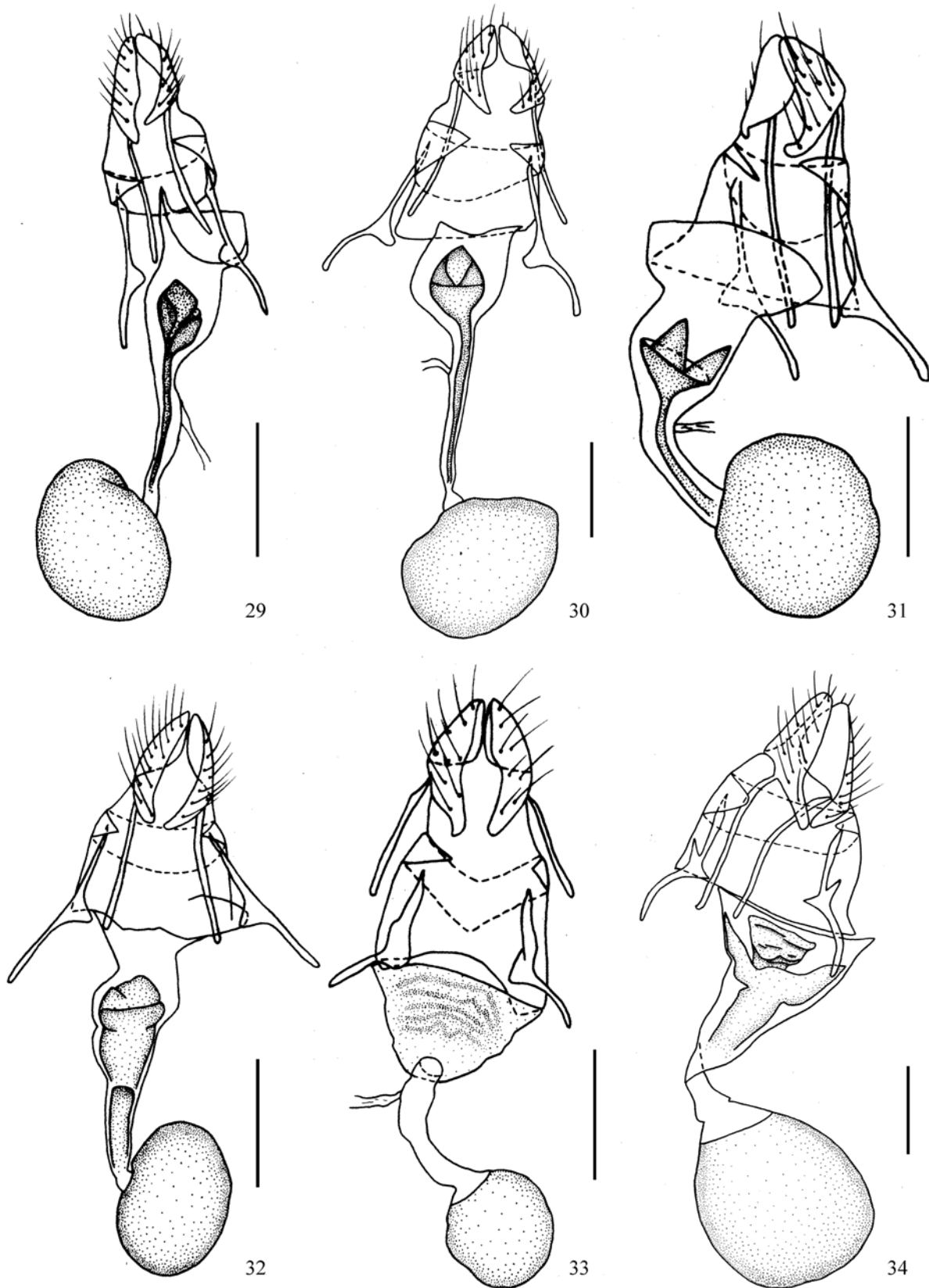
Distribution. China (Heilongjiang, Beijing, Hebei, Shandong, Henan, Shaanxi, Gansu, Jiangsu, Anhui, Hubei, Fujian); Japan, Korea.



Figs 13–20. Adults. 13. *Scirpophaga praelata*. 14. *S. xanthopygata*. 15. *S. nivella*. 16. *S. parvalis*. 17. *S. humilis*. 18. *S. excerptalis*. 19. *S. flavidorsalis*, male. 20. *S. flavidorsalis*, female.



Figs 21–28. Male genitalia. a. Aedeagus. 21. *Scirpophaga praelata*. 22. *S. xanthopygata*. 23. *S. nivella*. 24. *S. parvalis*. 25. *S. humilis*. 26. *S. excerptalis*. 27. *S. magnella*. 28. *S. flavidorsalis*. Scale bars=1 mm.



Figs 29–34. Female genitalia. 29. *Scirpophaga praelata*. 30. *S. xanthopygata*. 31. *S. nivella*. 32. *S. parvalis*. 33. *S. excerptalis*. 34. *S. magnella*. Scale bars = 1 mm.

***Scirpophaga humilis* Wang, Li & Chen, 1986** (Figs 17, 25)

Scirpophaga humilis Wang, Li & Chen, 1986. *Acta Ent. Sinica*, 29 (2): 208. Type locality: China, Anhui.

Description. Body ochreous white. Length of labial palpi about the diameter of compound eyes. Forewing pale yellow, without fascia. Female with anal tuft yellow. In male genitalia, subteguminal process with sinuous margin; aedeagus slightly swollen in apical, one slender and one stout long-based cornuti present, the larger one with bifid tip. In female genitalia, antrum broad, strongly sclerotized; ductus bursae relatively short, a little longer than the diameter of corpus bursae.

Distribution. China (Jiangsu, Anhui).

3.1.2 *excerptalis* group***Scirpophaga excerptalis* (Walker, 1863)** (Figs 18, 26, 33)

Chilo excerptalis Walker, 1863. *List Specimens Lipid. Insects Colln Br. Mus.*, 27: 142. Type locality: India.

Scirpophaga monostigma Zeller, 1863. *Chilonidarum Crambidarum Genera Species*: 3.

Scirpophaga butyrota Meyrick, 1889. *Trans. Ent. Soc. Lond.*, 1889: 520.

Scirpophaga intacta Snellen, 1890. *Meded. Proefstn Suik Riet W. Java 'Kagok'*: 94.

Topeutis(Thopeutis) rhodoproctalis Hampson, 1919. *Ann. Mag. Nat. Hist.*, (9) 4: 319.

Tryporyza intacta: Wang, 1980. *Economic Insect Fauna of China*, 21: 63.

Scirpophaga excerptalis: Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 223.

Description. Body white. Length of labial palpi about 1.5 times the diameter of compound eyes. Both wings white, without fascia; forewing sometimes with a dark fuscous spot at the lower angle of cell. Female with anal tuft orange-red. In male genitalia, subteguminal process a long spine; manica with two groups of strong spines. In female genitalia, ostium bursae broad, wrinkled and strongly sclerotized; section between ostium bursae and ductus seminalis sclerotized.

Distribution. China (Jiangxi, Hunan, Taiwan, Guangdong, Hainan, Guangxi, Sichuan, Guizhou, Yunnan); Japan, Pakistan, India, Nepal, Bangladesh, Thailand, Vietnam, Singapore, West Malaysia, Java, Sumba Island, Timor, Buru Island, Adonara Island, Ambon Island, Philippines, New Guinea, New Hannover, New Britain, New Ireland, Australia, Solomon Islands.

***Scirpophaga magnella* de Joannis, 1929** (Figs 27, 34, 35)

Scirpophaga magnella de Joannis, 1929. *Annls Soc. Ent. Fr.*, 98: 608; Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 226. Type locality: Vietnam.

Description. Body white. Length of labial palpi about 1.5 times the diameter of compound eyes. Both wings white, without fascia; forewing sometimes with a dark fuscous spot at lower angle of cell. Female with anal tuft ochreous yellow. In male genitalia, subteguminal process a short spine; manica with two groups of especially strong spines. In female genitalia, ostium broad, wrinkled; section between ostium bursae and ductus seminalis with a strong sclerotized plate.

Distribution. China (Zhejiang, Hunan, Guangdong, Hainan, Hong Kong, Guangxi, Sichuan, Yunnan, Xizang); Iran, Afghanistan, Pakistan, India, Nepal, Bangladesh, Myanmar, Thailand, Vietnam.

Remarks. In China, all materials from Xizang have a dark fuscous spot at the lower angle of cell on forewing, while such a spot is absent in other materials.

***Scirpophaga flavidorsalis* (Hampson, 1919)** (Figs 19, 20, 28, 51)

Topeutis flavidorsalis Hampson, 1919. *Ann. Mag. Nat. Hist.*, (9) 4: 319. Type locality: Bhutan.

Schoenobius melanostigmus Turner, 1922. *Proc. R. Soc. Vict.*, 35: 47; Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 231; Chen, Song & Wu, 2006. *Zootaxa*, 1236: 12.

Scirpophaga flavidorsalis: Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 230; Chen, Song & Wu, 2006. *Zootaxa*, 1236: 12.

Description. Body ochreous white. Length of labial palpi about 3–4 times the diameter of compound eyes. Forewing ochreous white, a dark fuscous spot at the lower angle of cell; hindwing pale ochreous. Female with anal tuft pale ochreous white. In male genitalia, subteguminal process tubercle-like; aedeagus slender, swollen in apical 1/3, a flat plate-like cornutus present, with serrate margin, manica with two groups of spines. In female genitalia, ostium bursae

broad, weakly sclerotized, section between ostium bursae and ductus seminalis weakly sclerotized.

Distribution. China (Yunnan); India, Bhutan, Bangladesh, Thailand, West Malaysia, Java, Philippines, New Guinea, Australia.

***Scirphaga tongyaii* Lewvanich, 1981** (Figs 36, 43, 52)

Scirphaga tongyaii Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 232; Chen, Song & Wu, 2006. *Zootaxa*, 1236: 14. Type locality: Thailand.

Description. Body pale ochreous white. Length of labial palpi about 2.5 times the diameter of compound eyes. Both wings white, without fascia. Female with anal tuft ochreous yellow. In male genitalia, valva broad; tegumen with sclerotized dorsal ridge two lines, with a tendency to join; subteguminal process spine-like; manica with two groups of spines. In female genitalia, ostium broad, wrinkled, section between ostium bursae and ductus seminalis sclerotized and annulated.

Distribution. China (Hainan, Yunnan); India, Myanmar, Thailand.

***Scirphaga xanthogastrella* (Walker, 1863)**

Apurima xanthogastrella Walker, 1863. *List Specimens Lipid. Insects Colln Br. Mus.*, 27: 194. Type locality: India.

Apurima costalis Moore, 1886. *Lepid. Ceylon*, 3: 388.

Scirphaga xanthogastrella: Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 227.

Description. Body white. Length of labial palpi about 2.5 times the diameter of compound eyes. Both wings white, without fascia. Female with anal tuft ochreous yellow. In male genitalia, subteguminal process small spine-like; manica with uniformly arranged minute spines. In female genitalia, ostium bursae broad, slightly wrinkled; ductus bursae membranous, section between ostium bursae and ductus seminalis sclerotized and constricted, section between ductus seminalis and corpus bursae broad.

Distribution. China (Taiwan); India, Nepal, Sri Lanka, Philippines.

***Scirphaga linguatella* Chen, Song & Wu, 2006** (Figs 37, 44)

Scirphaga linguatella Chen, Song & Wu, 2006. *Zootaxa*, 1236: 15. Type locality: China, Yunnan.

Description. Body white. Length of labial palpi about 3 times the diameter of compound eyes. Both wings white; without fascia. In male genitalia, subteguminal process lobe-like and linguiform; aedeagus swollen in apical 1/3, three flat plate-like cornuti present, with serrate margin, manica with two groups of spines.

Distribution. China (Yunnan).

***Scirphaga adunctella* Chen, Song & Wu, 2006** (Figs 38, 45, 53)

Scirphaga adunctella Chen, Song & Wu, 2006. *Zootaxa*, 1236: 15. Type locality: China, Yunnan.

Description. Wing span ♀ 30–38 mm. Female white, anal tuft pale ochreous; others same to male. Both male and female sometimes have a dark fuscous spot present at the lower angle of cell on forewing.

Female genitalia. Anal papillae broad, covered with long setae; apophyses anterioris and posterioris well developed and with the same length; ostium bursae broad and long, strongly wrinkled, sclerotized towards ductus bursae, different with other species; ductus bursae membranous; corpus bursae round, lined with dense spines.

Material examined. IZCAS: Holotype ♂, Yunnan, Wanding, 820 m, 29 May 1979. Others. Xizang, Mêdog, 1 ♂, 1080 m, 23 August 2006, Fu-Qiang Chen; Xizang, Mêdog, Ma'niweng, 1 ♀, 930 m, 25 August 1974, Fu-Sheng Huang; Xizang, Mêdog, Ma'niweng, 895 m, 1 ♀, 14 August 2006, Fu-Qiang Chen; Xizang, Mêdog, Hanmi, 2120 m, 1 ♀, 10 August 2006, Fu-Qiang Chen; Xizang, Mêdog, Didong, 840 m, 3 ♀, 16 August 2006, Fu-Qiang Chen.

Distribution. China (Yunnan, Xizang).

Remarks. The female of this species is firstly reported here. Chen *et al.* (2006) reported the species according to a single male specimen. At that time, we could not match the right female with the male, although some possible materials were checked. Later, more materials of the species were gotten from Xizang. The materials from Xizang sometimes have a dark fuscous spot present at the lower angle of cell on forewing, which is common in *excerptalis* group.

***Scirpophaga khasis* Lewvanich, 1981** (Figs 39, 46)

Scirpophaga khasis Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 230; Chen, Song & Wu, 2006. *Zootaxa*, 1236: 16. Type locality: India, Khasia.

Description. Body ochreous white. Length of labial palpi about 2 times the diameter of compound eyes. Forewing white, a dark fuscous spot at the lower angle of cell. In male genitalia, subteguminal process tubercle-like; manica with two groups of strong spines.

Distribution. China (Yunnan); India.

3.1.3 *occidentella* group***Scirpophaga virginia* Schultze, 1908** (Figs 40, 47, 54)

Scirpophaga virginia Schultze, 1908. *Philipp. J. Sci.*, (A) 3: 34; Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 236. Type locality: Philippines.

Niphadoses gilviberbis Wang, 1978, *Acta Ent. Sinica*, 21 (2): 171; Wang, 1980. *Economic Insect Fauna of China*, 21: 66; Wang, 1981. *Iconographia Heterocerorum Sinicorum* I: 61 (*nec* Zeller, 1863).

Description. Smaller than other species in the genus. Body pale ochreous white. Length of labial palpi about the diameter of compound eyes. Both wings white, without fascia. Female with anal tuft grayish white. In male genitalia, subteguminal process round; juxta with dense spines at apex, two groups of strong sclerotized spines present.

Distribution. China (Heilongjiang, Beijing, Shandong, Henan, Shaanxi, Shanghai, Jiangsu, Anhui, Hubei, Jiangxi, Hunan, Fujian, Taiwan, Guangxi, Yunnan); Japan, Bangladesh, Vietnam, Thailand, Sri Lanka, West Malaysia, Singapore, Borneo, Sumatra, Philippines.

***Scirpophaga fusciflua* Hampson, 1893**

Scirpophaga fusciflua Hampson, 1893. *Ill. Typical Specimens Lepid. Het. Colln Br. Mus.*, 9: 167; Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 234. Type locality: Sri Lanka.

Description. Small sized. Body pale ochreous white. Length of labial palpi about the diameter of compound eyes. Both wings white, without fascia. Female with anal tuft grayish white or ochreous yellow. In male genitalia, subteguminal process bilobed; juxta with dense spines at apex, two groups of strong sclerotized spines present.

Distribution. China (Taiwan); Afghanistan, India, Nepal, Thailand, Sri Lanka.

3.1.4 *lineata* group***Scirpophaga lineata* (Butler, 1879)** (Fig. 41)

Apurima lineata Butler, 1879. *Ann. Mag. Nat. Hist.*, (5) 4: 457. Type locality: Japan.

Schoenobius lineata: Wang, 1980. *Economic Insect Fauna of China*, 21: 57.

Scirpophaga lineata: Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 240; Chen, Song & Wu, 2006. *Zootaxa*, 1236: 19.

Description. White body. Length of labial palpi about 3–4 times the diameter of compound eyes. Forewing with a dark fuscous spot at the lower angle of cell, an oblique brown fascia from apex to middle of inner margin. Female with anal tuft white. In male genitalia, subteguminal process rectangular, constricted at base. In female genitalia, ostium bursae and ductus bursae membranous, section between ostium bursae and ductus seminalis constricted, lined with sclerotized plates.

Distribution. China (Jiangxi, Hainan, Yunnan); Japan, India, Malaysia, Indonesia.

***Scirpophaga auristrigella* (Hampson, 1895)** (Figs 42, 48)

Schoenobius auristrigella Hampson, 1895. *Proc. Zool. Soc. Lond.*, 1895: 916. Type locality: Bhutan.

Scirpophaga auristrigella: Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 242; Chen, Song & Wu, 2006. *Zootaxa*, 1236: 19.

Description. Body pale yellow. Length of labial palpi about 3 times the diameter of compound eyes. Forewing with a dark fuscous spot at the lower angle of cell, an oblique yellow fascia from apex to middle of inner margin. In male genitalia, subteguminal process with posterior margin produced to form a spine.

Distribution. China (Guangxi); India, Bhutan.

3.1.5 *incertulas* group

Scirpophaga incertulas (Walker, 1863) (Figs 49, 55, 57, 58)

Chilo incertulas Walker, 1863. *List Specimens Lipid. Insects Colln Br. Mus.*, 27: 143. Type locality: Borneo.

Catagela ?admotella Walker, 1863. *List Specimens Lipid. Insects Colln Br. Mus.*, 27: 192.

Schoenobius minutellus Zeller, 1863. *Chilonidarum Crambidarum Genera Species*: 5.

Tipanaea bipunctifera Walker, 1863. *List Specimens Lipid. Insects Colln Br. Mus.*, 28: 523.

Chilo gratosellus Walker, 1864. *List Specimens Lipid. Insects Colln Br. Mus.*, 30: 967.

Schoenobius bipunctifer ab. *quadripunctellifera* Strand, 1918. *Stettin. Ent. Ztg.*, 79: 263.

Tryporyza incertulas: Wang, 1980. *Economic Insect Fauna of China*, 21: 60.

Scirpophaga incertulas: Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 243.

Description. Length of labial palpi about 3 times the diameter of compound eyes. Male body ochreous; forewing ochreous, a dark fuscous spot at the lower angle of cell, an oblique fuscous fascia from apex to the lower angle of cell. Female body yellow, anal tuft ochreous yellow; forewing yellow, a dark fuscous spot at the lower angle of cell. In male genitalia, subteguminal process a bifid spine; aedeagus slender, two adjacent unequal curved spine-like cornuti present. In female genitalia, corpus bursae usually lined with dense spines in the basal 3/4.

Distribution. China (Beijing, Henan, Shaanxi, Jiangsu, Anhui, Zhejiang, Hubei, Jiangxi, Hunan, Fujian, Taiwan, Guangdong, Hainan, Hong Kong, Guangxi, Sichuan, Guizhou, Yunnan). Japan, Afghanistan, India, Nepal, Bangladesh, Myanmar, Vietnam, Thailand, Sri Lanka, West Malaysia, Singapore, Sumatra, Java, Borneo, Sumbo, Sulawesi, Philippines.

3.1.6 *whalleyi* group

Scirpophaga whalleyi Lewvanich, 1981 (Figs 56, 59)

Scirpophaga whalleyi Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 251; Chen, Song & Wu, 2006. *Zootaxa*, 1236: 21. Type locality: Sri Lanka.

Description. Body ochreous yellow. Length of labial palpi about 2 times the diameter of compound eyes. Both wings without fascia. Female with anal tuft yellowish white. In male genitalia, subteguminal process membranous, lobe-like; aedeagus with a group of curved spine-like cornuti. In female genitalia, ductus bursae and ductus seminalis strongly sclerotized near ostium bursae.

Distribution. China (Yunnan); India, Sri Lanka.

3.1.7 *gatoi* group

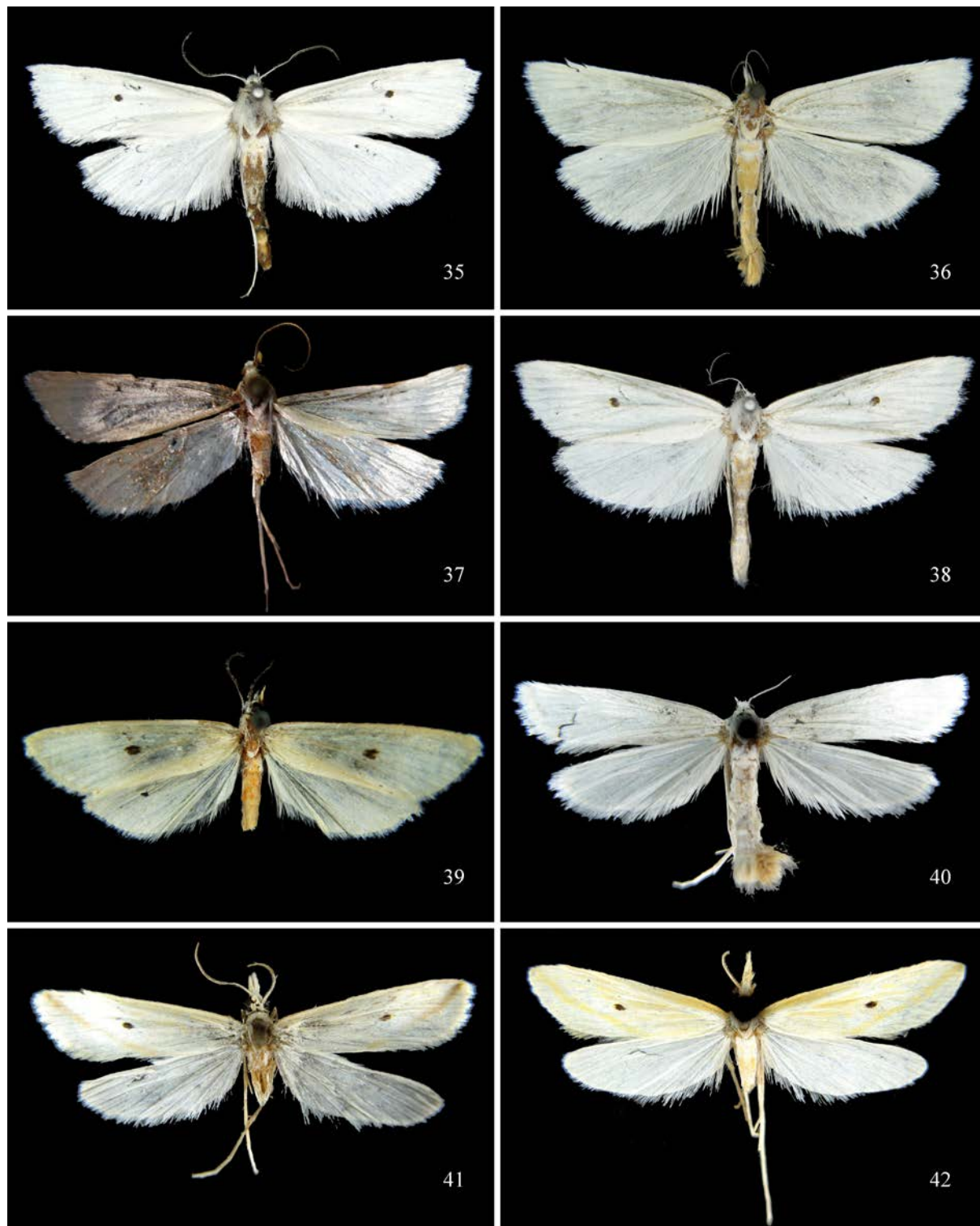
Scirpophaga gatoi Lewvanich, 1981 (Fig. 60)

Scirpophaga gatoi Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 249. Type locality: Japan.

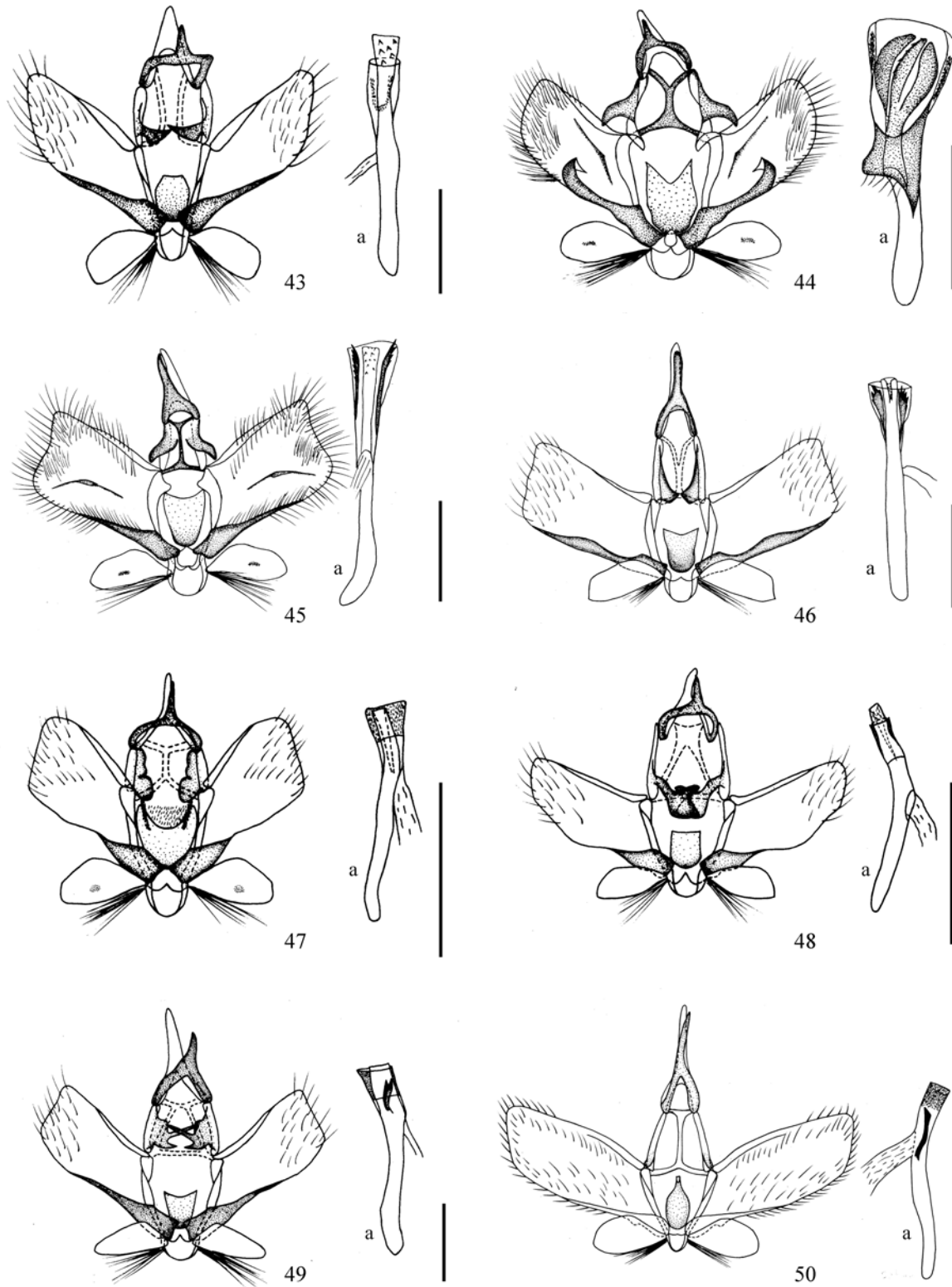
Description. Body ochreous yellow. Length of labial palpi about 3 times the diameter of compound eyes. Both wings shining ochreous yellow, sometimes a dark fuscous spot present at forewing. In male genitalia, subteguminal process lobe like. In female genitalia, ductus bursae sclerotized wholly, section between ostium bursae and ductus seminalis constricted.

Distribution. China (Jiangsu, Guangdong); Japan.

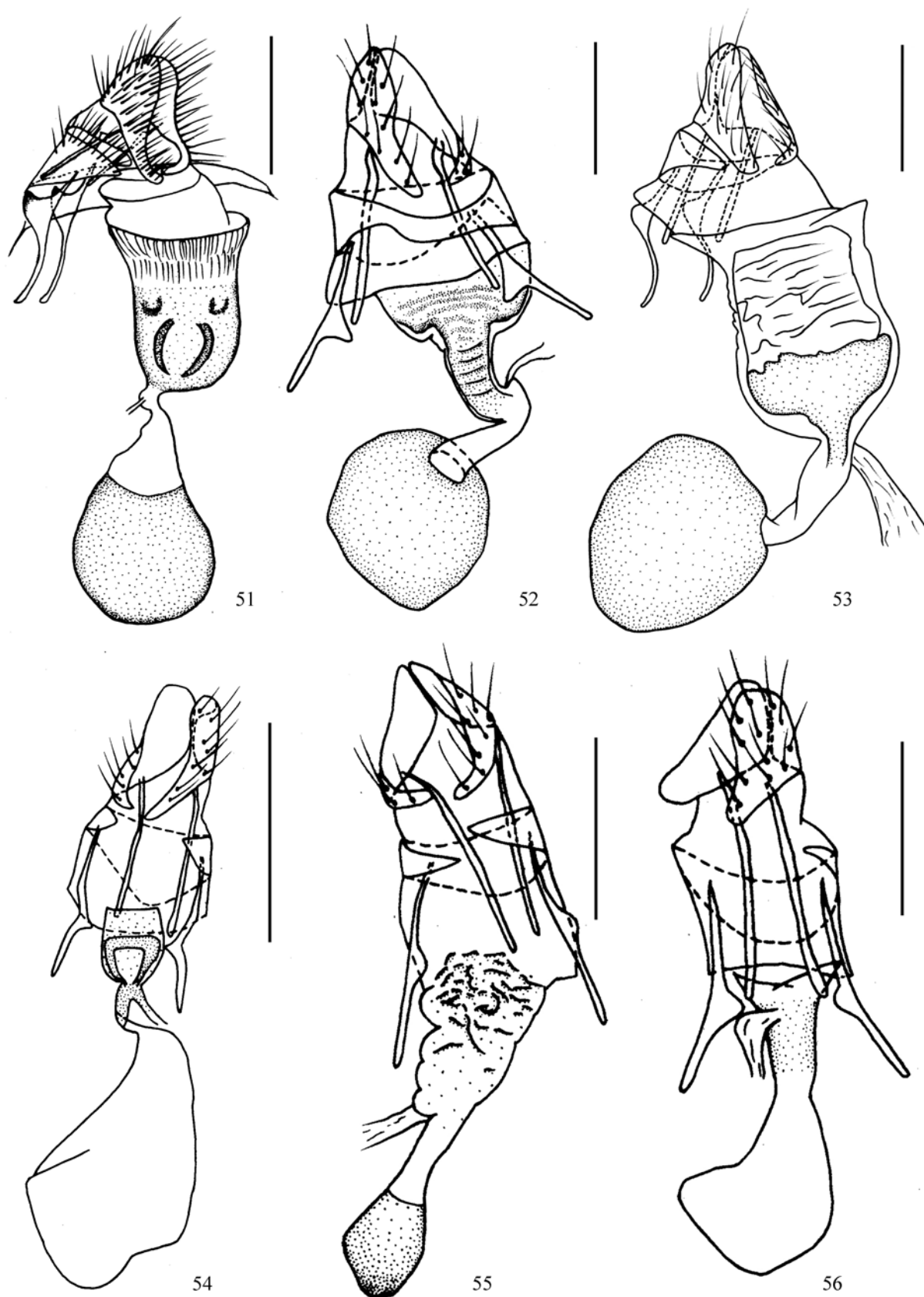
Remarks. According to the original description of the species, the forewing has a dark fuscous spot present at the lower angle of cell. In our examination, this spot is absent in the materials from Guangdong. So the character may be various in different populations as in the *excerptalis* group.



Figs 35–42. Adults. 35. *Scirpophaga magnella*. 36. *S. tongyaii*. 37. *S. linguatella*. 38. *S. adunctella*. 39. *S. khasis*. 40. *S. virginia*. 41. *S. lineata*. 42. *S. auristrigella*.



Figs 43–50. Male genitalia. a. Aedeagus. 43. *Scirpophaga tongyaii*. 44. *S. linguatella*. 45. *S. adunctella*. 46. *S. khasis*. 47. *S. virginia*. 48. *S. auristrigella*. 49. *S. incertulas*. 50. *Schoenobius gigantellus*. Scale bars = 1 mm.



Figs 51–56. Female genitalia. 51. *Scirpophaga flavidorsalis*. 52. *S. tongyaii*. 53. *S. adunctella*. 54. *S. virginia*. 55. *S. incertulas*. 56. *S. whalleyi*. Scale bars = 1 mm.

3.2 *Schoenobius Duponchel*, 1836 (Figs 2, 50, 61–67, 73–74, 81–84)

Schoenobius Duponchel, 1836. *Hist. Nat. Lepid. Fr.*, 10: 8, 22. Type species: *Tinea gigantella* Denis & Schiffermüller, 1775, by original designation (cited as *gigantellus*, a mandatory emendation).

Diagnosis. The genus is different from other genera by long labial palpi in adults and juxta with raised apex in male genitalia.

Description. Head with frons round; antennae weakly serrated in male and filiform in female; labial palpi porrect, longer than 3 times of the diameter of compound eyes, the second segment longer than other two; maxillary palpi expanded apically. Female with anal tuft on the seventh abdominal segment.

Wings (Fig. 2). Wing patterns simple, some groups polymorphic. Forewing with R_1 close to Sc; R_2 , R_{3+4} and R_5 from upper angle of cell; R_3 and R_4 stalked; M_1 below upper angle of cell; M_2 and M_3 from lower angle of cell; Cu_1 and Cu_2 before lower angle of cell; CuP present at distal area. Hindwing with Sc+ R_1 and Rs shortly stalked, more or less stalked with M_1 at base; M_2 , M_3 and Cu_1 close basally; Cu_2 before lower angle of cell.

Male genitalia. Uncus and gnathos simple, beak-like, without any armature; tegumen with sclerotized dorsal ridge usually X-shaped; subteguminal process various, papilliform, fingerlike or hook-like; valva simple, approximately rectangular, distal truncated; juxta with apex raised; saccus usually round; coremata present; aedeagus elongate, vesica with coarse spinules, a slender irregular spine present, manica with minute spinules; ductus ejaculatorius from little above the middle of aedeagus.

Female genitalia. Anal papillae broad, with long setae; apophyses anterioris and posterioris well developed; ostium bursae broad, usually wrinkled; ductus bursae membranous, no longer than corpus bursae; corpus bursae round, membranous.

Distribution. Oriental, Palearctic and Australia Regions.

Remarks. The genus has 35 species reported. Five species are reported in China here, including one species as new to science and one species unnamed.

Key to species of *Schoenobius* in China

1. Male and female similarly sized, wing span usually 16–23 mm; both wings without obvious fasciae..... 2
Male and female quite differently sized, wing span 16–27 mm in male, 23–42 mm in female; both wings with obvious fasciae or spots 3
2. Forewing white, suffused with brownish ochreous; hindwing white, with a slight ochreous tinge..... *S. micralis*
Forewing pale yellow; hindwing pure white, without other tinge *S. sp.*
3. Forewing brown to fuscous, polymorphic. In male genitalia, uncus and gnathos relatively slender, juxta pyriform, the apex short and pointed..... *S. gigantellus*
Forewing reddish brown or ochreous, not polymorphic. In male genitalia, uncus and gnathos relatively strong and short, juxta pyriform, the apex elongated (genitalia only known in *S. scirpus* **sp.nov.**)..... 4
4. Forewing reddish brown. In female genitalia, the length of ductus bursae about the same as the diameter of corpus bursae..... *S. scirpus* **sp. nov.**
Forewing ochreous, thickly streaked with coppery red. In female genitalia, the length of ductus bursae obvious longer than the diameter of corpus bursae *S. dodatellus*

Schoenobius gigantellus (Denis & Schiffermüller, 1775) (Figs 50, 61–62, 81)

Tinea gigantellus Denis & Schiffermüller, 1775. *Syst. Verz.*: 135; Hampson, 1895. *Proc. Zool. Soc. Lond.*, 1895: 916. Type locality: Austria, Vienna.

Chilo spurcatellus Walker, 1863. *List Specimens Lipid. Insects Colln Br. Mus.*, 27: 142.

Schoenobius gigantellus: Wang, 1980. *Economic Insect Fauna of China*, 21: 57.

Description. Length of labial palpi about 4 times as long as the diameter of compound eyes. Female with anal tuft yellow brown. Both sexes with two varieties (Figs 61–62). In one variety, a dark fuscous longitudinal fascia from base to outer margin; in another variety, fuscous fasciae absent. Hindwing with a fuscous fascia at postmedial area in male, while wholly white in female. In male genitalia, subteguminal process papilliform; juxta pyriform, apex raised, with a longitudinal process; aedeagus slender, a slender irregular spine-like cornutus present.

Material examined. IZCAS: Heilongjiang, Yichun, 1♂, 19 June 1964; Heilongjiang, Yichun, 1♂, 10 July 1969;

Heilongjiang, Dailing, 390m, 1♂, 1♀, 18 July 1958, Zhou Shixiu; Neimenggu, Yimeng, 3♀, 9–12 June 1980, Lai-Ming Jin; Neimenggu, Humeng, 1♂, 2 July 1986, Wei Xiao; Beijing, 1♀, 19 July 1948; Beijing, 1♀, 6 May 1950; Beijing, Xijiao Park, 1♂, 9 June 1952, Yi-Ran Zhang; Beijing, Xijiao Park, 1♀, 9 July 1952; Beijing, Xijiao Park, 4♀, 4–11 August 1952; Beijing, Xishan, 1♂, 25 August 1958; Beijing, Xishan, 1♀, 28 May 1962; Beijing, Zhongguancun, 1♂, 25 May 1961; Beijing, Sanpu, 1♀, 23 June 1972, Bao-Lin Zhang; Tianjin, 1♀, 8 May 1951; Tianjin, 3♀, 18 May–7 June 1956; Tianjin, August 1956; Tianjin, 1♀, 15 May 1957; Tianjin, 1♀, 28 May 1962; Tianjin, 1♂, 1♀, 24 May 1963; Tianjin, 14 June 1963; Tianjin, 1♂, 1♀, 12–16 July 1963; Tianjin, 22 June 1965; Tianjin, Jinghai, Liangwangzhuang, 7♂, 6♀, 25 July–2 August 1959; Hebei, 1♀, 8 May 1981; Hebei, Tanghai, 1♀, 22 June 1989, Su-Bai Liao; Hebei, Baoding, 5♀, 12 April 1974; Shandong, Qihe, 1♀, July 1969; Shandong, Qihe, 10♀, 13 August–29 September 1969, Yong-Lin Chen; Shanxi, Taigu, 1♀, 26 July 1958, Jian-Rui Xu; Henan, Xinxiang, 3♂, 3♀, 1–25 May 1973; Xinjiang, Kumishi, 1♀, 15 August 1955, Shi-Jun Ma; Xinjiang, Qinghe, 1♀, 2 August 1956, Wei-Yi Yang; Xinjiang, Kashi, 2♀, 1–8 August 1980; Xinjiang, Kashi, 1♂, 1♀, 23–28 April 1982; Xinjiang, Aqi, 1♀, 10 July 1971; Jiangsu, Wuxi, 1♀, 6 June 1964, Zheng-Wen Du; Hunan, Mt. Heng, 1♀, 29 May 1974, Bao-Lin Zhang.

Distribution. China (Heilongjiang, Neimenggu, Beijing, Tianjin, Hebei, Shanxi, Shandong, Henan, Xinjiang, Jiangsu, Hunan, Guangdong); Europe.

***Schoenobius scirpus* sp. nov.** (Figs 63–64, 73, 82)

Schoenobius forficellus Wang, 1980. *Economic Insect Fauna of China*, 21: 57. (nec Thunberg, 1794) (part misidentification)

Diagnosis. This species is similar to *S. gigantellus*, but the forewing has an oblique fascia, which is absent in *S. gigantellus*; in male genitalia, the uncus and the gnathos of this species are obviously shorter than those of *S. gigantellus*, and the subteguminal processes of these two species are obviously differently shaped.

Description. Wing span ♂ 25–29mm, ♀ 30–38mm. Head rufous; labial palpi porrect, rufous, 3 times as long as the diameter of compound eyes; maxillary palpi porrect, rufous, as long as the diameter of the compound eyes. Thorax and abdomen rufous, female with anal tuft yellow brown. Male with forewing rufous, two dark fuscous spots at both upper and lower angle of cell, a dark fuscous fascia from the nearby of apex to lower angle of cell, a blurry longitudinal rufous band from base to distal of cell; hindwing pale fuscous, without any fasciae. Female little paler than male in color.

Male genitalia. Uncus and gnathos strong, beak-like, apex pointed; gnathos as long as uncus; tegumen broad, with sclerotized dorsal ridge X-shaped; subteguminal process hook-like, weakly sclerotized; valva the same width from base to apex; juxta with apex elongated, little shorter than basal part; saccus round; coremata present; aedeagus slender, a slender irregular spine-like cornutus present.

Female genitalia. Anal papillae broad, covered with long setae; apophyses anterioris and posterioris well developed, about 1.5 times as long as anal papillae; ostium bursae broad, wrinkled; ductus bursae as long as corpus bursae; ductus seminalis below ostium bursae; corpus bursae round, membranous.

Biology. The species takes 6 generations per year in Guangxi Province. Larvae bore the stem of sedge, especially adlittoral sedge. Larvae live in single plant all their lives, and seldom transfer to another plant. Mature larvae pupate at the base of stem. Female lays eggs after mating, usually in mass. A female can lay 3–807 eggs. The eggs are usually laid on the stem near water. It also can be laid on rice, water bamboo, and hyacinth besides sedge. The species usually hibernates by mature larvae in stem of sedge (Wang, 1980).

Host plant. *Scirpus grossus*.

Holotype ♂, Guangxi, Yulin, 7 October 1973, deposited in IZCAS.

Paratypes. Guangxi, Yulin, 4♂, 12♀, 7 October 1973; Guangxi, Yulin, 6♀, 12 January 1974; Guangxi, Yulin, 10♂, 2♀, May 1974; Guangxi, Yulin, 1♂, July 1974; Guangxi, Rongxian, 1♂, 1♀, January 1975; all specimens deposited in IZCAS.

Distribution. China (Guangxi).

Remarks. Wang (1980) wrongly recognized this species as *Schoenobius forficellus* (Thunberg) (now in *Donacaulea* Meyrick, 1890). In his works, he treated the species as a variety of the real *S. forficellus*. The literal description from Wang should be *S. scirpus* and the color figure is the real *S. forficellus*. We recognized this species as new here since the female of this species has apex of forewing not sharply pointed as in *S. forficellus*.

Etymology. The name is corresponding to the genus name of the host plant.



Figs 57–64. Adults. 57. *Scirpophaga incertulas*, male. 58. *S. incertulas*, female. 59. *S. whalleyi*. 60. *S. gotoi*. 61–62. *Schoenobius gigantellus*. 63. *Sc. scirpus* **sp.nov.**, male. 64. *Sc. scirpus* **sp.nov.**, female.

***Schoenobius dodatellus* (Walker, 1864)** (Figs 67, 83)

Chilo dodatellus Walker, 1864. *List Specimens Lipid. Insects Colln Br. Mus.*, 30: 966; Hampson, 1896, *Fauna Brit. Ind. Moths*, 4: 48.

Type locality: Sri Lanka.

Chilo aditellus Walker, 1864. *List Specimens Lipid. Insects Colln Br. Mus.*, 30: 967.

Description. Body ochreous suffused with coppery red. Male with forewing ochreous, thickly streaked with coppery red; a diffused fuscous streak along lower margin of cell and vein M_2 , then bent up to apex; two black spots on discocellulares; a speck at base of vein Cu_2 , and three specks on vein 1A. Female with forewing less prominently streaked with red.

Material examined. IZCAS: Yunnan, Xishuangbanna, Damenglong, 650 m, 2♀, 2 July 1959, Yi-Ran Zhang; Yunnan, Xishuangbanna, Mengyang, 850 m, 1♀, 24 August 1957, Ling-Chao Zang.

Distribution. China (Yunnan); Japan, India, Myanmar, Sri Lanka.

***Schoenobius micralis* Hampson, 1919**

Schoenobius micralis Hampson, 1919. *Ann. Mag. Nat. Hist.*, (9) 4: 321. Type locality: China, Fujian.

Description. Body ochreous brown. Forewing brownish ochreous. Hindwing ochreous.

Material examined. None.

Distribution. China (Fujian).

Remarks. Type materials of the species were collected from Fujian Province in China (Fokien, Ting-hai). We only checked two adult figures of the type materials from BMNH so far, the genital information is unknown.

***Schoenobius* sp.** (Figs 65–66, 74, 84)

Description. Wing span ♂ 19–23 mm, ♀ 19–23 mm. Head pale yellow; labial palpi porrect, pale fuscous, 3 times as long as the diameter of compound eyes; maxillary palpi porrect, pale fuscous. Thorax and abdomen pale yellow. Wings without any fasciae. Male with forewing pale yellow, costa little darker; hindwing white. Female with forewing paler than male; hindwing white.

Male genitalia. Uncus short, with base broad and apex pointed; gnathos similar with uncus, apex pointed; tegumen broad, with sclerotized dorsal ridge X-shaped; subteguminal process fingerlike, weakly sclerotized; valva with the same width from base to distal, distal truncated; juxta plate-like, apex raised, with a longitudinal process centrally; saccus round; coremata present; aedeagus slender, a slender irregular spine-like cornutus present.

Female genitalia. Anal papillae broad, with long setae; apophyses anterioris and posterioris well developed, 1.5 times as long as anal papillae; ostium bursae broad, wrinkled; ductus bursae little shorter than the diameter of corpus bursae; ductus seminalis below the ostium bursae; corpus bursae round, membranous.

Material examined. IZCAS: Tianjin, 1♂, 28 May 1952; Tianjin, 1♀, 11 July 1959; Tianjin, 1♂, 4 June 1963; Tianjin, 1♂, 1982, Lian-Sheng Zhang; Tianjin, Jinghai, Liangwangzhuang, 1♂, 1♀, 25 July–3 August 1959; Hebei, Tanghai, 1♂, 22 June 1989, Su-Bai Liao.

Distribution. China (Tianjin, Hebei).

Remarks. The species looks similar to *S. micralis*, by the absence of the fascia on wings. By contrasting with the figures of *S. micralis* from BMNH, *S. sp.* has the hindwing white, while *S. micralis* has the hindwing ochreous. As the difference is minute, it is not suitable to report the species as a new species. As a result, the species is unnamed here.

3.3 *Donacaula* Meyrick, 1890 (Figs 3, 68, 116)

Donacaula Meyrick, 1890. *Trans. Ent. Soc. Lond.*, 1890: 466. Type species: *Tinea mucronella* Denis & Schiffermüller, 1775, by monotypy.

Diagnosis. The genus is distinguished from other genera by vein R_2 stalked with R_{3+4} on forewing and uncus and gnathos strongly shortened in male genitalia (Speidel, 2005).

Description. Head with frons round; antennae weakly serrated; labial palpi porrect and long, the second segment usually suffused with loose scales; maxillary palpi expanded apically. Female usually with anal tuft on the seventh abdominal segment.



Figs 65–72. Adults. 65. *Schoenobius* sp., male. 66. *Sc.* sp., female. 67. *Sc. dodatellus*. 68. *Donacaula forficellus*. 69. *Catagela adjurella*, male. 70. *C. adjurella*, female. 71. *C. rubelineola*, male. 72. *C. rubelineola*, female.

Wings (Fig. 3). Forewing with Sc and R₁ anastomosed or separated; R₂ and R₃₊₄ stalked or separated; R₅ from upper angle of cell; M₁ below upper angle of cell; M₂ and M₃ from lower angle of cell; Cu₁ and Cu₂ before lower angle of cell. Hindwing with Sc+R₁ and Rs long stalked, more or less stalked with M₁ at base; M₂ and M₃ point-touched basally, from lower angle of cell; Cu₁ and Cu₂ before lower angle of cell.

Male genitalia. Uncus and gnathos relatively short, beak-like; tegumen with sclerotized dorsal ridge usually X-shaped; subteguminal process narrow, protruding ventrally, various in different species; valva simple, without any armature; juxta somewhat pyriform, with apex raised but various in different species; saccus usually round; coremata present, weakly sclerotized; aedeagus elongate, usually with cornutus, manica with minute spinules; ductus ejaculatorius from little above the middle of aedeagus.

Female genitalia. Anal papillae broad, with long setae; apophyses anterioris and posterioris well developed; ostium bursae narrow; ductus bursae membranous, no longer than corpus bursae; corpus bursae round or elongate, membranous.

Distribution. Holarctic, Oriental and Neotropical Regions.

Remarks. The genus has about 15 species reported, including two species from China.

Key to species of *Donacula* in China

1. Female with apex of forewing relatively blunt, a white spot present at the lower angle of cell. Male with valva truncated apically; female with ductus seminalis from just below ostium bursae *D. niloticus*
 Female with apex of forewing sharply pointed, a black spot present at the lower angle of cell. Male with valva round apically; female with ductus seminalis nearby the middle of ductus bursae *D. forficellus*

Donacula niloticus (Zeller, 1867)

Schoenobius niloticus Zeller, 1867. *Trans. Ent. Soc. Lond.*, (3)5: 462, pl. 24, fig. 2. Type locality: Egypt.

Schoenobius alpherakii Strand, 1874. *Stett. Ent. Zeit.*, 97; Caradja, 1925. *Mem. Sect. Stiint. Acad. Rom.*, (3) 3: 301. Type locality: Russia.

Schoenobius vescerellus Chrétien, 1910. *Bull. Soc. Ent. Fr.*, 1910: 368.

Schoenobius argophthalmus Meyrick, 1933. *Exot. Microlepid.*, 4 (12): 377.

Donacula niloticus: Speidel, 2005. *Pyraloidea I, Microlepidoptera of Europe*, 4: 119.

Description. Forewing pale ochreous in both sexes; male with a dark brown line from costal margin to centre of wing, running parallel to outer margin; female with a white discocellulares spot and a relatively blunt apex. In male genitalia, subteguminal process reduced; juxta pyriform, apex raised and slightly elongated.

Material examined. None.

Distribution. China (Gansu); Russia, Europe, Egypt.

Remarks. This species was recorded in Gansu Province (Kan-su) by Caradja (1925) (reported as *Schoenobius alpherakii*). There is no further information until now. We did not find the species in our collection. Our description is mainly based on Speidel (2005).

Donacula forficellus (Thunberg, 1794) (Figs 68, 116)

Tinea forficellus Thunberg, 1794. *Diss. Ent.*, 7: 85, fig. 4. Type locality: Sweden.

Tinea consortella Hübner, 1796. *Sammlung Europäischer Schmetterlinge*, 8: 23, pl. 32, fig. 220.

Tinea lanceolella Hübner, 1810. *Sammlung Europäischer Schmetterlinge*, 8: pl.43, fig. 296.

Palparia hirta Haworth, 1811. *Lepidoptera Britannica*, 3: 483.

Donacula forficellus: Speidel, 2005. *Pyraloidea I, Microlepidoptera of Europe*, 4: 120.

Description. Forewing yellow, a fuscous band along the upper margin of cell, from the base to apex; a fuscous spot at lower angle of cell; apex blunt in male and sharply pointed in female. In male genitalia, subteguminal process lobe-like; juxta nearly pyriform, with apex raised.

Material examined. IZCAS: Heilongjiang, Yichun, Dailing, 1♀, 12 November 1963.

Distribution. China (Heilongjiang); Europe.

Remarks. The species is similar to *D. mucronella*, which mainly distributes from north Europe to Northern Asia. *D. forficellus* has a black spot at lower angle of cell and R₂ free from R₃₊₄ on forewing, while *D. mucronella* has spot absent

and R₂, R₃ and R₄ stalked. In female genitalia, ductus bursae of *D. forficellus* is little longer than that in *D. mucronella* (Speidel, 2005).

Additionally, Wang (1980) wrongly identified *Schoenobius scirpus* **sp.nov.** as *D. forficellus* (see *Schoenobius scirpus*).

3.4 *Catagela* Walker, 1863 (Figs 4, 69–72, 75–76, 85–86)

Catagela Walker, 1863. *List Specimens Lipid. Insects Colln Br. Mus.*, 27: 191. Type species: *Catagela adjurella* Walker, 1863, by monotypy.

Diagnosis. The genus is different from other genera by the extremely elongated juxta.

Description. Head with frons round; proboscis reduced; antennae weakly serrated; labial palpi porrect, long, the third segment about half length of the second, with apex pointed; maxillary palpi porrect, about 1/3 as long as labial palpi. Female with anal tuft on the seventh abdominal segment.

Wings (Fig. 4). Wing patterns simple, forewing usually with an oblique line from apex to inner margin. Forewing slender, R₁ before upper angle of cell, not closed to Sc; vein R₂ to R₅ arising from upper angle of cell, R₃ and R₄ stalked; M₁ just below upper angle of cell; M₂ and M₃ closed but well separated, M₃ from lower angle of cell; Cu₁ and Cu₂ before lower angle of cell. Hindwing with Sc+R₁ and Rs long stalked, more or less stalked with M₁ at base; M₂ and M₃ separated, M₃ from lower angle of cell; Cu₁ and Cu₂ before lower angle of cell.

Male genitalia. Uncus and gnathos beak-like, apex pointed; tegumen broad, with sclerotized dorsal ridge X-shaped; base of subteguminal process broader than other genus of the Schoenobiinae; valva with the same width from base to apex, apex truncated or oblique; vinculum broad; juxta with apex extremely elongated; saccus usually round; coremata present, weakly sclerotized; aedeagus usually with a cornutus, various in different species; ductus ejaculatorius arising from middle of aedeagus.

Female genitalia. Anal papillae broad, covered with long setae; apophyses anterioris and posterioris well developed; ostium bursae broad, wrinkled, dense minute spines present inside; ductus bursae membranous, relatively short, no longer than corpus bursae; ductus seminalis arising below ostium bursae; corpus bursae elongated, membranous.

Distribution. Oriental Region.

Remarks. The genus comprises four species, including two species from China.

Key to species of *Catagela* in China

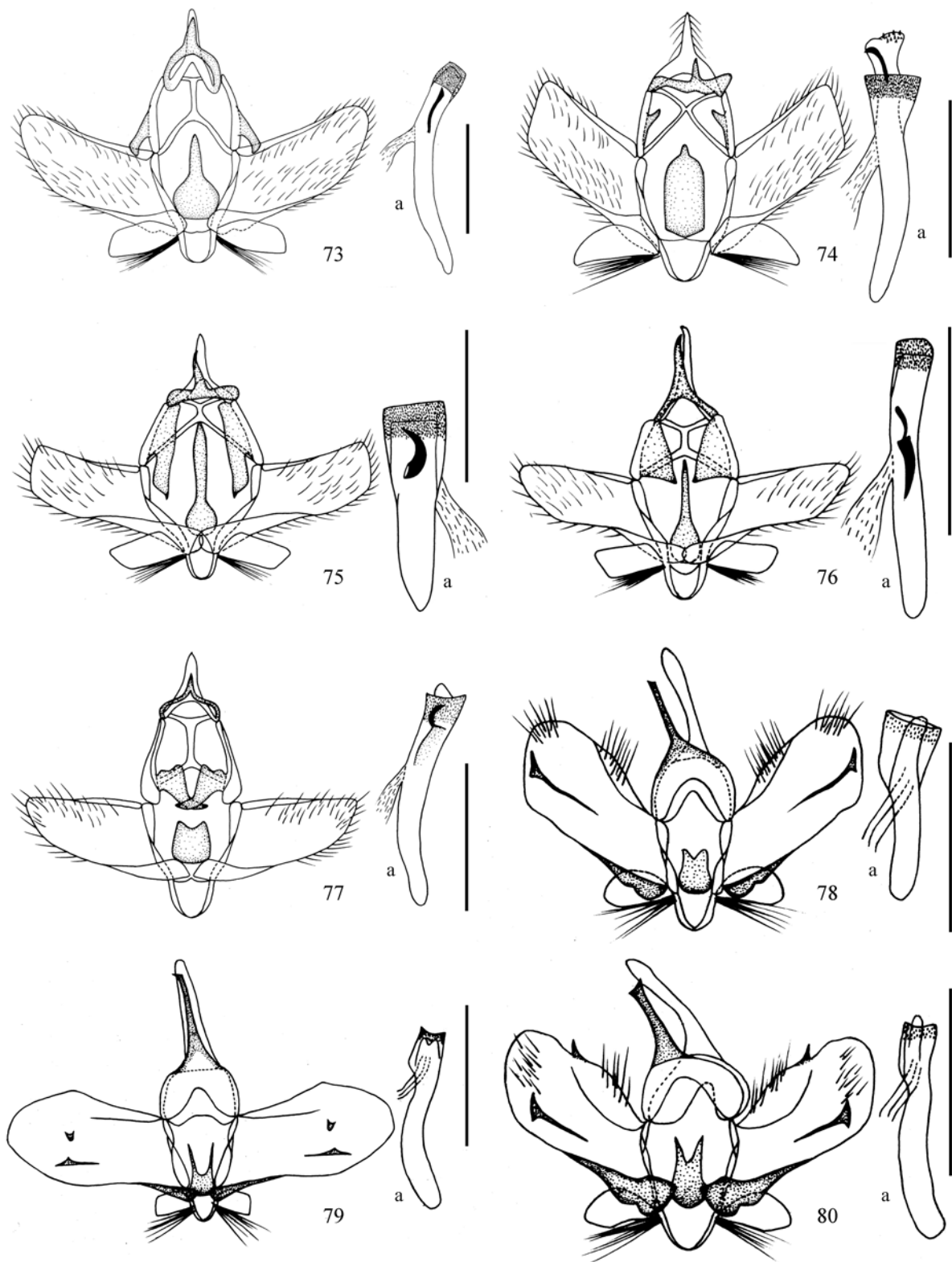
1. Forewing with fuscous fasciae; apex of valva truncated; subteguminal process relatively narrow; aedeagus strong, cornutus spine-like, curved.....*C. adjurella*
Forewing with pink fasciae; apex of valva oblique; subteguminal process relatively broad; aedeagus slender, cornutus irregular.....*C. rubelineola*

Catagela adjurella Walker, 1863 (Figs 69–70, 75, 85)

Catagela adjurella Walker, 1863. *List Specimens Lipid. Insects Colln Br. Mus.*, 27: 191; Wang, 1980. *Economic Insect Fauna of China*, 21: 64. Type locality: Sri Lanka.

Description. Forewing with fuscous fasciae; small spots present at upper angle, lower angle and middle of cell; an oblique line from apex to middle of inner margin. Hindwing with a blurry fascia at postmedial area in male, without any fasciae in female. In male genitalia, valva with apex truncated; aedeagus strong, cornutus spine-like, curved

Material examined. IZCAS: Shandong, Qingdao, 1♀, 23 September 1975; Henan, Xinxiang, 1♀, 30 July 1973; Henan, Lushi, 1♀, 12 July 1975; Henan, Lushi, 1♂, 12 September 1975; Jiangsu, Wangting, 2♀, 1–11 September 1958, Cui-Xia Jin; Anhui, Hefei, 8♂, 7♀, April 1966; Anhui, Xuancheng, 1♂, 2♀, August 1977; Zhejiang, Mt. Tianmu, 1♀, 2 September 1981, Shi-Mei Song; Hubei, Wuchang, Nanhu, 1♀, 6 August 1964; Hubei, Wuchang, Nanhu, 2♀, 13–31 May 1975; Hubei, Wuchang, Nanhu, 4♀, 3 August–2 September 1975; Hubei, Wuchang, Nanhu, 5♀, 29 September–16 October 1975; Hubei, Wuchang, Nanhu, 1♀, 23 September 1976; Hubei, Jingzhou, 3♀, July 1960; Hubei, Xinzhou, Moshang, Hudong, 14♀, 1976, Zheng-Hua Hu; Guangdong, Guangzhou, 50 m, 1♂, 1♀, 16–25 August 1958, Bao-Lin Zhang, Lin-Yao Wang; Guangdong, Guangzhou, 50 m, 1♂, 18 September 1958; Guangdong, Guangzhou, 1♂, 18 September 1958, Lin-Yao Wang; Guangdong, Zhanjiang, 1♀, 1 July 1976; Hainan, Xinglong, 1♀, 22 April 1963; Hainan, Xinglong, 1♂, 1♀



Figs 73–80. Male genitalia. a. Aedeagus. 73. *Schoenobius scirpus* sp. nov. 74. *Sc.* sp. 75. *Catagela adjurella*. 76. *C. rubelineola*. 77. *Niphadoses dengcaolites*. 78. *Patissa fulvosparsa*. 79. *P. minima*. 80. *P. tenuosa*. Scale bars = 1 mm.

19 May 1963; Hainan, Xinglong, 2♀, 8–16 June 1963; Hainan, Jiangfengling, 1♀, 29 May 1973; Yunnan, Xishuangbanna, Meng'a, 1050–1080 m, 8♀, 15–16 August 1958, Shu-Yong Wang; Yunnan, Xishuangbanna, Menghai, 1200–1600 m, 1♀, 1 June 1962, Shi-Mei Song; Yunnan, Xishuangbanna, Mengyang, 810 m, 1♂, 1♀, 31 March 1957, Fu-Ji Pu; Yunnan, Xishuangbanna, Mengyang, 850 m, 1♀, 6 September 1958, Le-Yi Zheng; Yunnan, Xishuangbanna, Ganlanba, 650 m, 1♀, 12 March 1957, Shu-Yong Wang.

Distribution. China (Shandong, Henan, Jiangsu, Anhui, Zhejiang, Hubei, Hunan, Guangdong, Hainan, Yunnan); India, Sri Lanka.

***Catagela rubelineola* Wang & Sung, 1979** (Figs 71–72, 76, 86)

Catagela rubelineola Wang & Sung, 1979. *Acta Ent. Sinica*, 22(2): 180; Wang, 1980. *Economic Insect Fauna of China*, 21: 65. Type locality: China, Guangdong.

Description. Forewing with pink fasciae; fuscous spots present at both the upper and lower angles of cell; three paralleled oblique fasciae arising from base of lower margin of cell to base of inner margin, from middle of lower margin of cell to basal trisection of inner margin and from apex to terminal trisection of inner margin. In male genitalia, valva with apex oblique; aedeagus slender, cornutus irregular.

Material examined. IZCAS: Holotype ♂, Guangdong, Guangzhou, 26 August 1958, Lin-Yao Wang. Paratypes. Anhui, Chuxian, Mt. Langya, 1♀, 28 July 1972, Shi-Mei Song; Jiangxi, Liantang, 1♂, 4 August 1957, Lin-Yao Wang; Jiangxi, Mt. Jiulian, 1♂, 21 May 1977, You-Qiao Liu; Jiangxi, Mt. Jiulian, 1♀, 23 May 1977, You-Qiao Liu; Guangdong, Guangzhou, 50 m, 1♂, 26 August 1958, Lin-Yao Wang; Guangdong, Guangzhou, 50 m, 1♂, 12 September 1958, Bao-Lin Zhang. Others. Jiangxi, Mt. Jiulian, 2♀, 12–21 June 1975, Shi-Mei Song; Guangdong, Guangzhou, Liuxihe, 1♀, 24 July 2005, Fu-Qiang Chen.

Distribution. China (Anhui, Jiangxi, Guangdong).

3.5 *Niphadoses* Common, 1960 (Figs 5, 77, 87–88, 102)

Niphadoses Common, 1960. *Austr. J. Zool.*, 8(2): 330. Type species: *Niphadoses pallescens* Common, 1960, by original designation.

Diagnosis. The genus can be diagnosed by valva constricted from base to apex and gnathos obviously short.

Description. Head with frons little protruded; proboscis reduced; antennae weakly serrated in male and filiform in female; labial palpi correct, the third segment about 1/3 as long as the second; maxillary palpi correct, apex expanded. Female with anal tuft on the seventh abdominal segment.

Wings (Fig. 5). Forewing with Sc and R₁ closed or anastomosed; R₂ from upper angle of cell, closed to R₃₊₄; R₃ stalked with R₄, from upper angle of cell; R₅ from upper angle of cell; M₁ below upper angle of cell; M₂ and M₃ from lower angle of cell; Cu₁ and Cu₂ before lower angle of cell. Hindwing with Sc+R₁ and Rs stalked, more or less stalked with M₁ at base; M₂ and M₃ from lower angle of cell; Cu₁ and Cu₂ before lower angle of cell.

Male genitalia. Uncus with base broad and apex pointed; gnathos thin and short, with apex pointed; tegumen well developed, with sclerotized dorsal ridge X-shaped; subteguminal process well developed, little sclerotized; valva constricted from base to apex; juxta plate-like, apex curved in the central; coremata present; aedeagus slender, cornutus present; ductus ejaculatorius arising from middle of aedeagus.

Female genitalia. Anal papillae broad, covered with long setae; apophyses anterioris and posterioris slender; ostium bursae broad, membranous, wrinkled; ductus bursae membranous, relatively short, no longer than corpus bursae; ductus seminalis arising below ostium bursae; corpus bursae usually round.

Distribution. China, Australia, New Guinea.

Remarks. The genus comprises five species, including one species from China.

***Niphadoses dengcaolites* Wang, Sung & Li, 1978** (Figs 77, 87–88, 102)

Niphadoses dengcaolites Wang, Sung & Li, 1978. *Acta Ent. Sinica*, 21 (2): 171; Wang, 1980. *Economic Insect Fauna of China*, 21: 66. Type locality: China, Jiangsu.

Description. Forewing pale yellow, suffused with fuscous scales along costa area; a dark fuscous patch at lower angle of cell; two dark fuscous spots present at trisections of vein 1A; a dark fuscous oblique line from apex to vein Cu₂; apex in female more pointed than that in male. In male genitalia, subteguminal process hook-like, weakly sclerotized; juxta

plate-like; aedeagus slender, a curved cornutus present.

Material examined. IZCAS: Holotype ♂, Jiangsu, Suzhou, July 1974. Paratypes. Jiangsu, Suzhou, 18♂, 35♀, August 1971, August 1972, July 1974, June 1976, Shi-Mei Song, Jia-Wei Chen, Hong-Gui Qiu, Xiao-Yu Chen, Pei-Fu Guo, Han-Chen Jiang, Zhong-Lin Wu; Hubei, Jingshan, 1♂, 3♀, 1975; Hunan, Changsha, 1♀, May 1976. Others. Jiangsu, Suzhou, 1♂, 3♀, August 1972, Shi-Mei Song; Jiangxi, Yiyang, 4♂, 1♀, April 1958, Shi-Mei Song; Sichuan, Mt. Ming, 1♂, June 1973.

Distribution. China (Jiangsu, Hubei, Jiangxi, Hunan, Sichuan).

3.6 *Patissa* Moore, 1886 (Figs 6, 79–80, 89–91, 103–105)

Patissa Moore, 1886, *Lepid. Ceyl.* 3: 388; Hampson, 1895. *Proc. Zool. Soc. Lond.*, 1895: 910; Hampson, 1896. *Fauna Brit. Ind. Moths*, 4: 43; Shibuya, 1928. *J. Fac. Agric. Hokkaido Univ.*, 22 (1): 58. Type species: *Metasia lactealis* Felder & Rogenhofer, 1875, by monotypy.

Eurycraspeda Swinhoe, 1890. *Trans. Ent. Soc. Lond.*, 1890: 284. Type species: *Eurycraspeda burmanalis* Warren, 1890, by monotypy.

Diagnosis. The genus is distinguishable from other genera by vein R_2 stalked with R_{3+4} on forewing, M_1 stalked with $Sc+R_1+Rs$ on hindwing and the harpe present in male genitalia.

Distribution. All over the world.

Remarks. The genus comprises about 27 species, in which six species were reported in China.

Key to species of *Patissa* in China

1. Veins of forewing concolorous with ground color 2
Veins of forewing darker than ground color 5
2. Forewing without fasciae *P. virginea*
Forewing with yellow or fuscous fasciae 3
3. Length of labial palpi about two times the diameter of compound eyes; forewing with thinner fuscous fasciae; valva with two spine-like harpes *P. tenuosa*
Length of labial palpi about the diameter of compound eyes; forewing with broader yellow fasciae; valva with a spine-like harpe, or two harpes but not as above 4
4. In male genitalia, two harpes present *P. minima*
In male genitalia, one harpe present *P. fulvosparisa*
5. Forewing white, slightly suffused with fuscous, without fasciae *P. nigropunctata*
Forewing suffused with dark fuscous scales except costal half area, with obvious fasciae *P. taiwanalis*

Patissa fulvosparisa (Butler, 1881) (Figs 78, 89, 103)

Apurima fulvosparisa Butler, 1881. *Trans. Ent. Soc. Lond.*, 1881: 591. Type locality: Japan.

Metasia candidulalis Swinhoe, 1885. *Proc. Zool. Soc. Lond.*, 1885: 880.

Patissa candidulalis Swinhoe & Cotes, 1889. *Cat. Moths of India*, 1889: 685.

Patissa tortualis Snellen, 1893. *Tijdr. v. Ent.*, 36: 58.

Donacula chlorosema Meyrick, 1894. *Trans. Ent. Soc. Lond.*, 1894: 11.

Patissa fulvosparisa: Hampson, 1895. *Proc. Zool. Soc. Lond.*, 1895: 911; Shibuya, 1928. *J. Fac. Agric. Hokkaido Univ.*, 22 (1): 59.

Description. Length of labial palpi about the diameter of compound eyes. Forewing white, with pale yellow fasciae. In male genitalia, valva with a spine-like harpe present at distal half of valva.

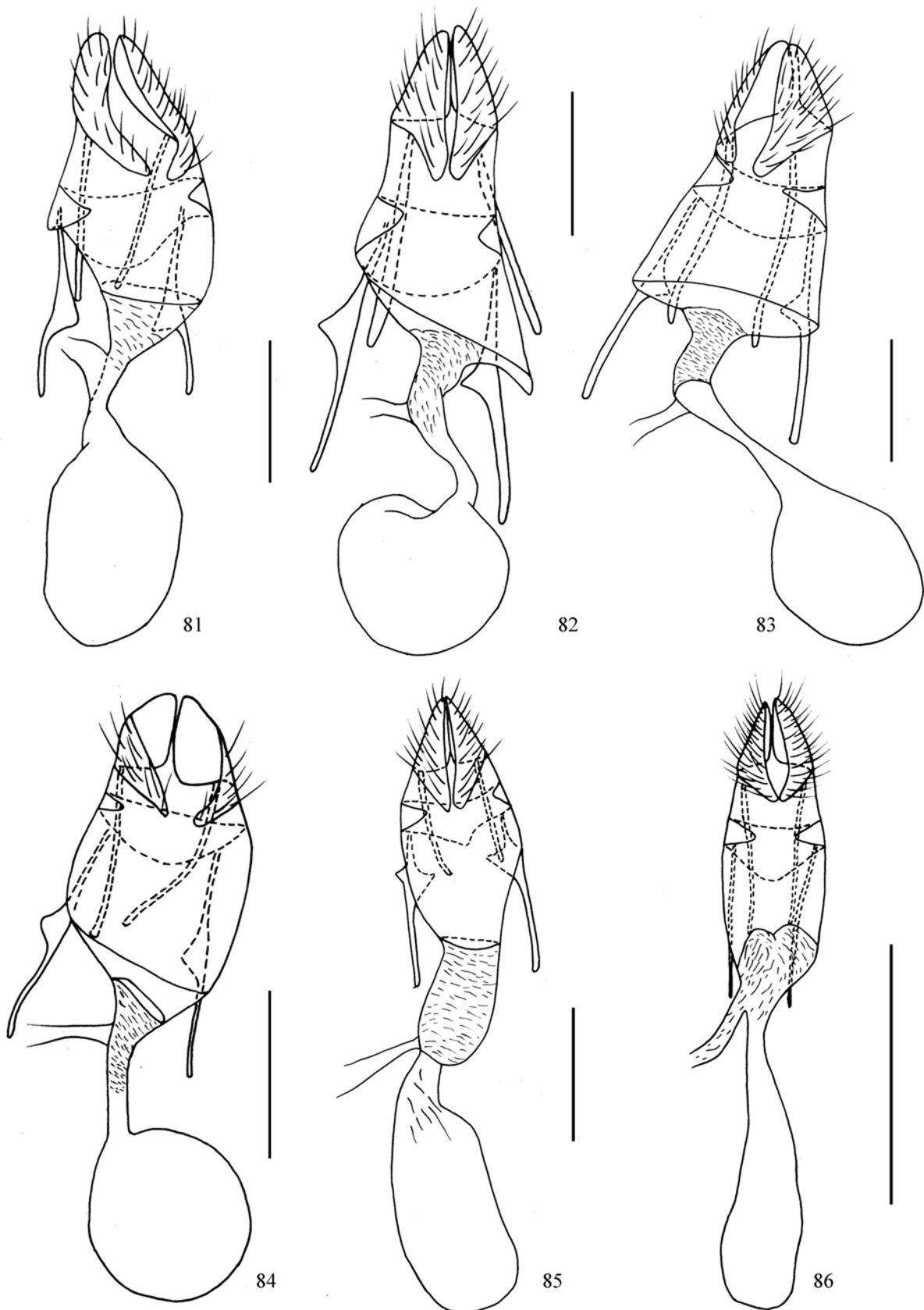
Distribution. China (Shandong, Jiangxi, Taiwan, Guangdong, Hainan, Yunnan); Japan, Korea, India, Indonesia.

Patissa minima Inoue, 1995 (Figs 79, 90, 104)

Patissa minima Inoue, 1995. *Jpn. J. Syn. Ent.*, 1 (1): 125. Type locality: Japan.

Description. Length of labial palpi about the diameter of compound eyes. Forewing white, with pale yellow fasciae. In male genitalia, valva with two harpes present at distal half of valva, one linguiform, another spine-like.

Distribution. China (Anhui, Jiangxi, Fujian, Guangxi); Japan.



Figs 81–86. Female genitalia. 81. *Schoenobius gigantellus*. 82. *Sc. scirpus* **sp.nov.** 83. *Sc. dodatellus*. 84. *Sc. sp.* 85. *Catagela adjurella*. 86. *C. rubelineola*. Scale bars = 1 mm.

***Patissa tenuousa* Chen, Song & Wu, 2007** (Figs 80, 91, 105)

Patissa tenuousa Chen, Song & Wu, 2007. *Oriental Insects*, 41: 269. Type locality: China, Sichuan.

Description. Length of labial palpi about 2 times the diameter of compound eyes. Forewing white, with fuscous fasciae, thinner than other species. In male genitalia, valva with two spine-like harpes present, one at middle of costa, another at distal half of valva.

Distribution. China (Sichuan).

***Patissa virginea* (Zeller, 1852)**

Scirpophaga virginea Zeller, 1852. *Lepid. Microptera Caffr.*: 67; Zeller, 1863. *Mon. Chil. & Cramb.*, 1863: 2. Type locality: South Africa, Natal.

Crambus multivagellus Swinhoe, 1886. *Proc. Zool. Soc. Lond.*, 1886: 462. Type locality: India.

Patissa virginea: Hampson, 1895. *Proc. Zool. Soc. Lond.*, 1895: 911; Hampson, 1896. *Fauna Brit. Ind. Moths*, 4: 45; Shibuya, 1928. *J. Fac. Agric. Hokkaido Univ.*, 22(1): 59; Lewvanich, 1981. *Bull. Br. Mus. Nat. Hist. (Ent.)*, 42: 189.

Description. Length of labial palpi about the diameter of compound eyes. Forewing pure white, sometimes with a black speck at the upper angle of cell.

Distribution. China (Taiwan); India, Sri Lanka, S. Africa.

Remarks. The species was recorded in Taiwan by Shibuya (1928). We did not get any materials except an adult figure of the type material from BMNH.

***Patissa nigropunctata* (Wileman & South, 1918)**

Scirpophaga nigropunctata Wileman & South, 1918. *Entomologist*, 51: 218. Type locality: China, Taiwan.

Patissa nigropunctata Shibuya, 1928. *J. Fac. Agric. Hokkaido Univ.*, 22 (1): 58.

Description. In male, forewing white with brownish tinge; veins beyond cell darker than the ground color; a black spot at the lower angle of cell. In female, forewing paler than that in male, black spots at the upper and the lower angles of cell, the lower spot larger.

Distribution. China (Taiwan).

Remarks. There is no material of the species being examined except an adult figure of the type material from BMNH.

***Patissa taiwanalis* (Shibuya, 1928)**

Eurycraspeda taiwanalis Shibuya, 1928. *J. Fac. Agric. Hokkaido Univ.*, 22 (1): 62. Type locality: China, Taiwan.

Description. Length of labial palpi about 2 times the diameter of compound eyes. Forewing grey, deeply suffused with dark brown; veins darker beyond the cell; small black spots at both the upper and the lower angles of cell.

Distribution. China (Taiwan).

3.7 *Ramila* Moore, 1867 (Figs 7, 92–97, 106–107)

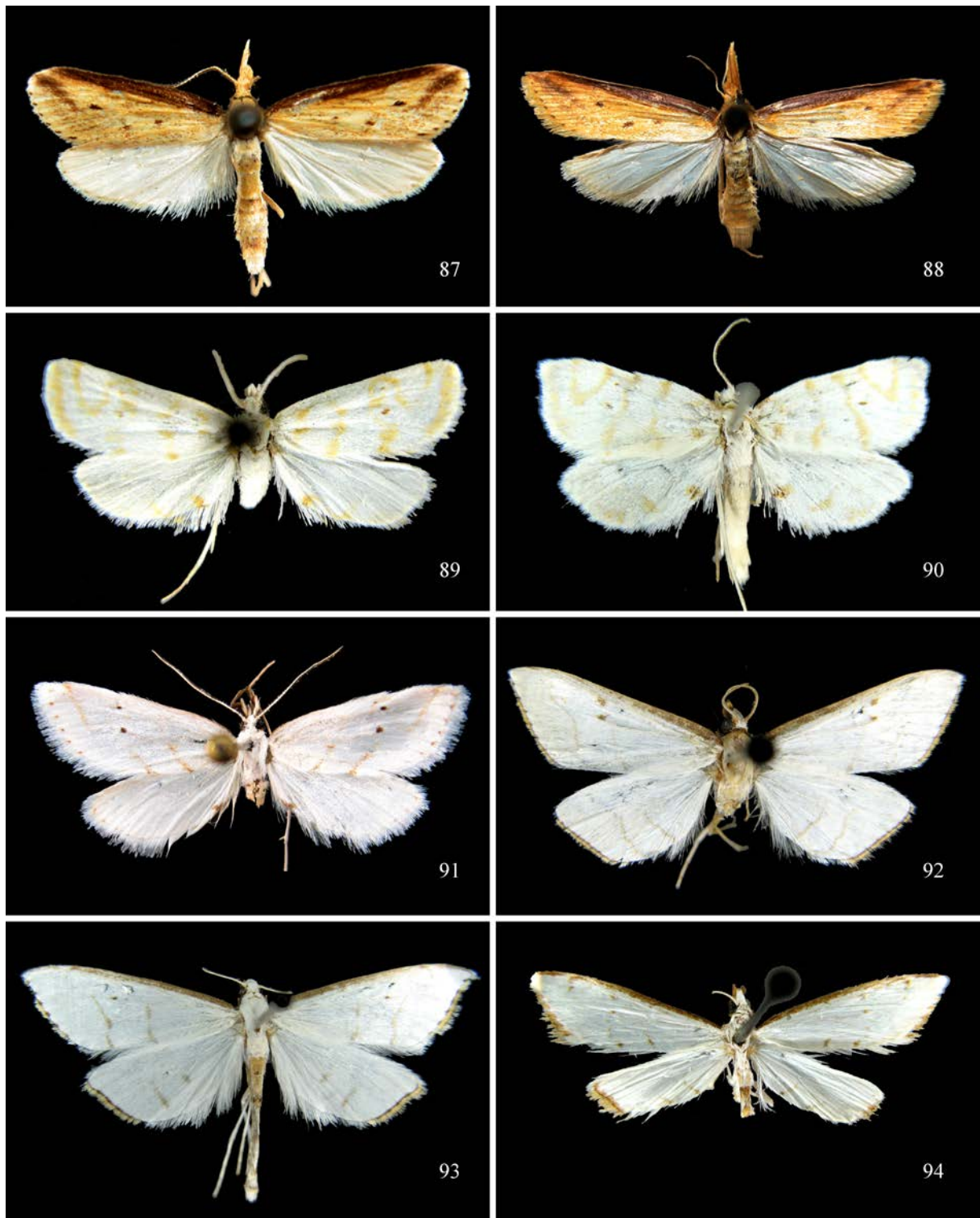
Ramila Moore, 1867. *Proc. Zool. Soc. Lond.*, 1867: 667; Wang, 1980. *Economic Insect Fauna of China*, 21: 55. Type species: *Ramila marginella* Moore, 1867, by monotypy.

Crambostenia Warren, 1890. *Trans. Ent. Soc. Lond.*, 1890: 292. Type species: *Margaronia acciusalis* Walker, 1859, by original designation.

Diagnosis. The genus is distinguished from other genera by porrect and peltate frons, vein R_2 stalked with R_{3+4+5} on forewing.

Description. Head with frons extending forwardly, as long as labial palpi; antennae filiform; labial palpi porrect; maxillary palpi as long as labial palpi; body strong, female with anal tuft poorly developed.

Wings (Fig. 7). Forewing with costa straight, apex pointed, outer margin oblique; Sc and R_1 anastomosed to the end; R_{3+4} and R_5 stalked, and both stalked with R_2 ; M_1 arising near upper angle of cell; M_2 and M_3 from lower angle of cell; Cu_1 arising near and Cu_2 before lower angle of cell. Hindwing with apex blunt, outer margin oblique; $Sc+R_1$ and Rs stalked mostly, and both stalked with M_1 at base; M_2 and M_3 from lower angle of cell; Cu_1 arising near and Cu_2 before lower angle of cell.



Figs 87–94. Adults. 87. *Niphadoses dengcaolites*, male. 88. *N. dengcaolites*, female. 89. *Patissa fulvosparis*. 90. *P. minima*. 91. *Patissa tenuosa*. 92. *Ramila marginella*. 93. *R. acciusalis*. 94. *R. minima* **sp.nov.**

Male genitalia. Uncus elongated, apex pointed or round; gnathos thinner than uncus, beak-like, apex with teeth dorsally; tegumen with sclerotized dorsal ridge more or less X-shaped; subteguminal process round or pointed; valva broad, apex truncated or oblique, suffused with long setae; juxta elongated, widened from base to apex, apex curved medially; saccus round; coremata usually present; aedeagus strong, usually with one to two spinose areas and one to two sclerotized plates, manica membranous, with minute spinules; ductus ejaculatorius arising from middle of aedeagus.

Female genitalia. Anal papillae slender, covered with long setae; apophyses anterioris and posterioris short, as long as anal papillae; ostium bursae broad, a sclerotized plate present inside; ductus bursae membranous, much longer than corpus bursae; corpus bursae membranous, signum a spinose area or a sclerotized spine.

Distribution. Oriental Region.

Remarks. *Ramila* is restricted to the Oriental Region, extending as far east as the Philippines. The genus comprises more than ten species (Robinson, Tuck & Shaffer, 1994). Four species are reported in China here, including one new species.

Key to species of *Ramila* in China

1. Small size, wing span less than 20 mm; male with a blunt sclerotized plate apically and a spinose area in aedeagus *R. minima* sp. nov.
Medium size, wing span larger than 20 mm; male with one or two pointed sclerotized plates apically and two spinose areas in aedeagus 2
2. Forewing with costa orange. In male genitalia, both uncus and valva with apex round; subteguminal process pointed. In female genitalia, corpus bursae with a spinose area *R. acciusalis*
Forewing with costa fulvous or fuscous. In male genitalia, both uncus and valva with apex pointed; subteguminal process round. In female genitalia, corpus bursae with a sclerotized spine-like signum (*R. marginella*) 3
3. Forewing with fasciae distinct *R. marginella*
Forewing with fasciae obsolescent *R. angustifimbrialis*

Ramila marginella Moore, 1867 (Figs 92, 95, 106)

Ramila marginella Moore, 1867. *Proc. Zool. Soc. Lond.*, 1867: 667. Type locality: India.

Description. Body silvery white. Labial palpi as long as the diameter of compound eyes. Forewing with costa fuscous. In male genitalia, uncus with apex pointed; subteguminal process round; valva with apex oblique; juxta elongated, widened from base to apex, apex curved medially; aedeagus strong, two spinose areas and a pointed sclerotized plate present at apex. In female genitalia, a strong sclerotized spine present at corpus bursae.

Material examined. IZCAS: Guangxi, Pingxiang, 1♀, 9 August 1973, Bao-Lin Zhang; Guangxi, Pingxiang, 3♂, 1♀, 13–16 June 1976, Bao-Lin Zhang; Guangxi, Ningming, 2♂, 23 May 1984, Shi-Mei Song; Guangxi, Longrui, 1♂, 25 May 1984, Shi-Mei Song; Guangxi, Xing'an, 2♂, 4–5 June 1984, Shi-Mei Song; Yunnan, Luxi, 1♂, 8 June 1980, Shi-Mei Song.

Distribution. China (Guangxi, Yunnan); India.

Ramila acciusalis Walker, 1859 (Figs 93, 96, 107)

Ramila acciusalis Walker, 1859. *List Specimens Lipid. Insects Colln Br. Mus.*, 19: 977; Wang, 1980. *Economic Insect Fauna of China*, 21: 55. Type locality: Borneo.

Description. Body silvery white. Labial palpi about 2 times as long as the diameter of compound eyes. Forewing with costa orange. In male genitalia, uncus with apex round; subteguminal process pointed; valva with apex round; juxta elongated, widened from base to apex, apex curved medially; aedeagus strong, two spinose areas and two triangular pointed sclerotized plates present at apex. In female genitalia, a spinose area present at corpus bursae.

Material examined. Jiangxi, Mt. Jiulian, 1♀, 28 May 1977, You-Qiao Liu; Fujian, Huangkeng, 1♂, 8♀, 30 June–5 July 1973, Bao-Lin Zhang; Hainan, Qiongzong, Maodan, 1♀, 7 July 1984; Hainan, Xinglong, 1♂, date absent, Bao-Lin Zhang; Yunnan, Jingdong, 1170 m, 3♂, 6 May–4 July 1956; Yunnan, Xishuangbanna, Meng'a, 1050–1080 m, 2♂, 1♀, 15–17 August 1958, Shu-Yong Wang, Fu-Ji Pu; Yunnan, Xishuangbanna, Menglong, 650 m, 1♀, 7 August 1958, Yi-Ran Zhang; Yunnan, Xishuangbanna, Menglun, 650 m, 1♂, 1♀, 27 May–31 July 1964, Bao-Lin Zhang; Yunnan, Cangyuan, 2♂, 1♀, 21 May 1980, Shi-Mei Song; Yunnan, Jinping, Hetouzhai, 1700 m, 9–13 May 1956, Ke-Ren Huang; Yunnan, Hekou,

Xiaonanxi, 200 m, 2♂, 11 June 1956, Ke-Ren Huang; Xizang, Mêdog, Aniqiao, 1080 m, 4♂, 1♀, 12 August 2006, Fu-Qiang Chen; Xizang, Mêdog, Maniweng, 895 m, 1♂, 14 August 2006, Fu-Qiang Chen; Xizang, Mêdog, Didong, 840 m, 3♂, 4♀, 16 August 2006, Fu-Qiang Chen; Xizang, Mêdog, Beibeng, 786 m, 2♂, 3♀, 18 August 2006, Fu-Qiang Chen; Xizang, Mêdog, 1080 m, 2♂, 2♀, 23 August 2006, Fu-Qiang Chen.

Distribution. China (Jiangxi, Fujian, Hainan, Yunnan, Xizang); India, Sri Lanka, Malaysia.

***Ramila minima* sp. nov.** (Figs 94, 97)

Diagnosis. The species is similar to *R. acciusalis*. In the male genitalia, this species has a spinose area and a blunt sclerotized plate at apex of aedeagus, while *R. acciusalis* has two spinose areas and two triangular pointed sclerotized plates. Besides, the shape of the subteguminal process is also different between *R. acciusalis* and *R. minima*. Additionally, *R. minima* is distinctly smaller than other species of this genus.

Description. Wing span ♂ 15–16 mm. Body silvery white; head silvery white, frons extending forwardly; labial palpi porrect, fuscous, as long as the diameter of compound eyes; maxillary palpi fuscous, porrect; both sides of frons and thorax fuscous; forelegs fuscous, midlegs and hindlegs white; abdomen white. Forewing silvery white; costa fuscous, a fuscous spot at the basal trisection; fuscous spots at both the upper and lower angles of cell; antemedial line fuscous, from lower angle of cell to middle of inner margin; postmedial line fuscous, sinuous, paralleled with outer margin; apex pointed; marginal line fuscous; cilia yellow, fuscous near base; underside white. Hindwing white; antemedial and postmedial lines fuscous, sinuous and blurry, paralleled, trisected the wing; marginal line fuscous; cilia yellow, fuscous near the base; underside white.

Male genitalia. Uncus elongate, with apex round; gnathos thinner than uncus, apex with teeth dorsally; tegumen with sclerotized dorsal ridge X-shaped; subteguminal process pointed; valva broad, apex truncated; juxta elongated, widened from base to apex, apex curved medially; saccus round; coremata present; aedeagus strong, a spinose area and a blunt sclerotized plate present at apex, manica with minute spinules.

Female genitalia. Unknown.

Holotype ♂, Shandong, Mt. Lao, 800 m, August 1940, deposited in IZCAS.

Paratype 1♂, Vietnam, Tonkin, Hoa-Binh, July 1940, A. de Cooman, deposited in IZCAS.

Distribution. China (Shandong); Vietnam.

Etymology. The name is derived from the Latin “*mini*”, corresponding to the small size of adults.

***Ramila angustifimbrialis* (Swinhoe, 1890)**

Crambostenia angustifimbrialis Swinhoe, 1890. *Trans. Ent. Soc. Lond.*, 1890: 293. Type locality: Myanmar.

Description. Body silvery white. Forewing with costa fulvous; the lines obsolescent; the marginal line more maculate. Material examined. None.

Distribution. China (Taiwan); India, Nepal, Bhutan, Myanmar, Thailand.

Remarks. An adult figure of the type material from BMNH was checked. Robinson, Tuck & Shaffer (1994) also provided some information about the species.

3.8 *Archischoenobius* Speidel, 1984 (Figs 8, 98–101, 108–111, 117–119)

Archischoenobius Speidel, 1984. *Neue Ent. Nachr.*, 12: 17; Chen, Song & Wu, 2007. *Oriental Insects*, 41: 259. Type species: *Parthenodes pallidalis* South, 1901, by original designation.

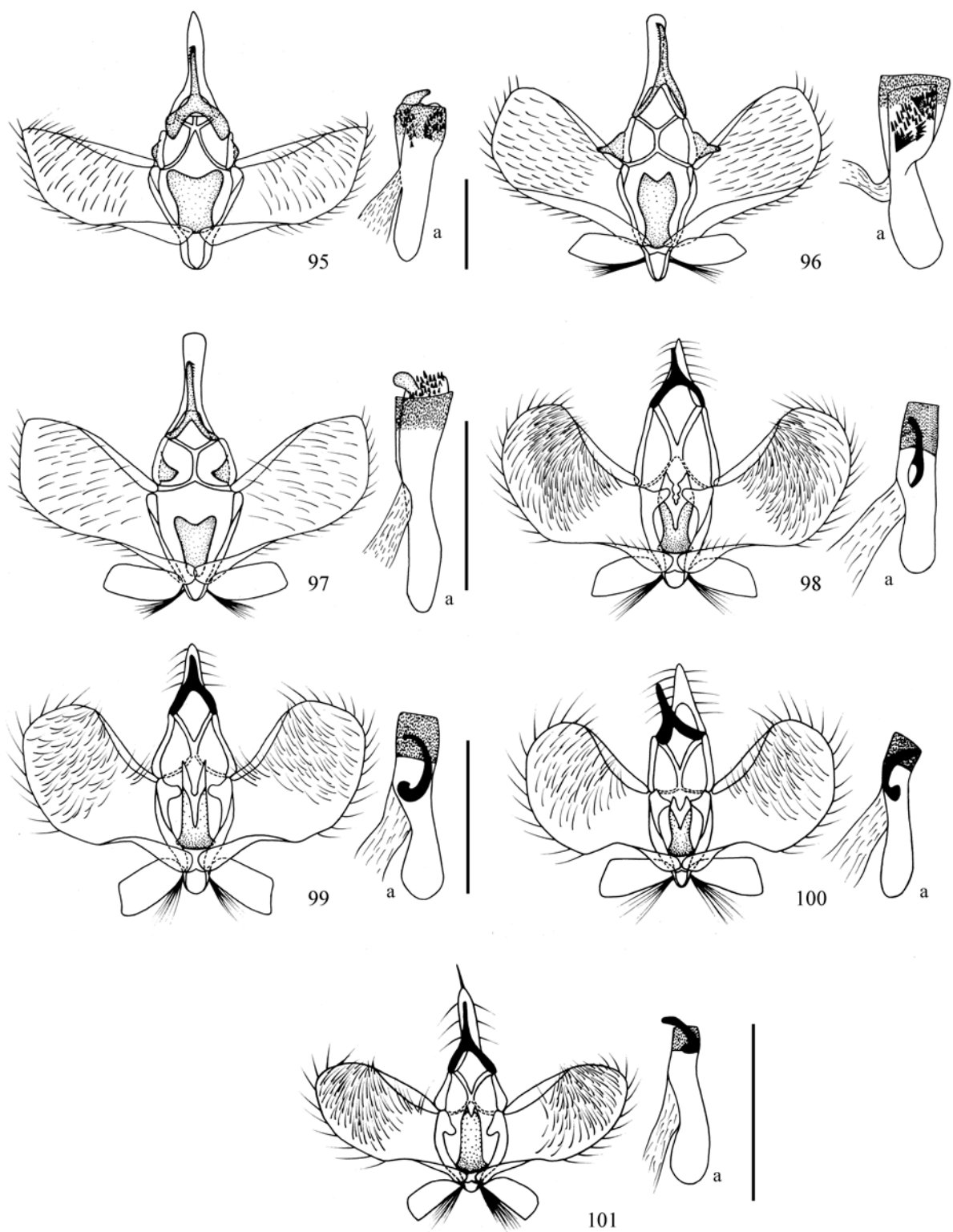
Diagnosis. The genus is different from other genera by the complex fasciae on both wings, especially the series of black metallic spots on outer margin of hindwing.

Distribution. China.

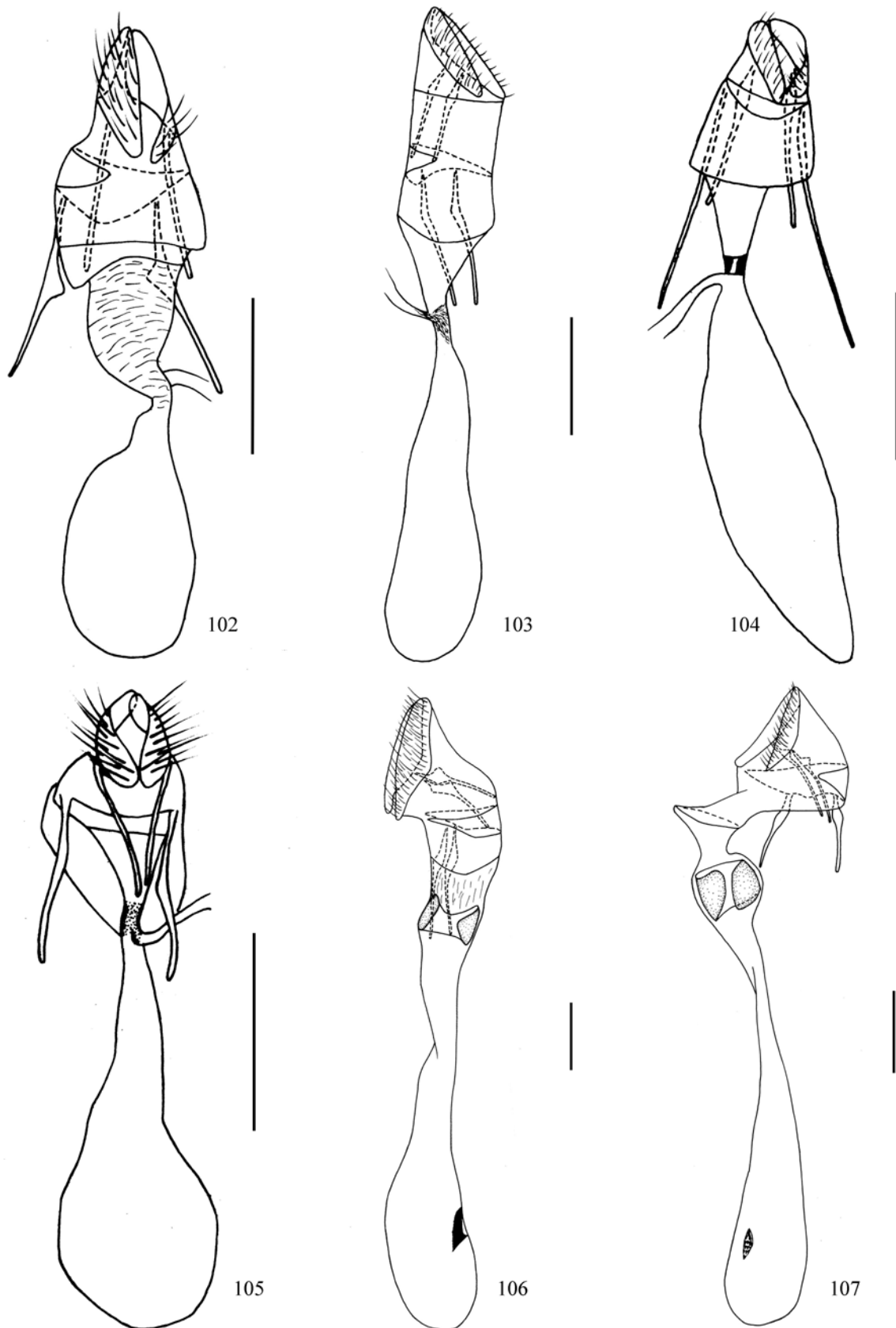
***Archischoenobius pallidalis* (South, 1901)** (Figs 98, 108, 117)

Parthenodes pallidalis South, 1901. In: Leech, *Trans. Ent. Soc. Lond.*, 1901: 439. Type-locality: China, Hubei.

Archischoenobius pallidalis: Speidel, 1984. *Neue Ent. Nachr.*, 12: 17; Chen, Song & Wu, 2007. *Oriental Insects*, 41: 260.



Figs 95–101. Male genitalia. a. Aedeagus. 95. *Ramila marginella*. 96. *R. acciusalis*. 97. *R. minima* sp.nov. 98. *Archischoenobius pallidalis*. 99. *A. nigrolepis*. 100. *A. nanlingensis*. 101. *A. minumus*. Scale bars = 1 mm.



Figs 102–107. Female genitalia. 102. *Niphadoses dengcaolites*. 103. *Patissa fulvosparsa*. 104. *P. minima*. 105. *P. tenuosa*. 106. *Ramila marginella*. 107. *R. acciusalis*. Scale bars = 1 mm.

Description. Hindwing pale fuscous at posterior portion. In male genitalia, juxta constrict on both sides, apex bifurcated, with membranous plate; cornutus straight.

Distribution. China (Hubei, Fujian, Guangxi, Sichuan, Yunnan).

***Archischoenobius nigrolepis* Chen, Song & Wu, 2007** (Figs 99, 109, 118)

Archischoenobius nigrolepis Chen, Song & Wu, 2007. *Oriental Insects*, 41: 261. Type-locality: China, Fujian.

Parthenodes pallidalis Wang *et al.*, 2003. *Fauna of Pyralidae of Wuyishan Nature Reserve in China*: 170 (*nec* South, 1901).

Description. Hindwing suffused with black scales at posterior portion. In male genitalia, juxta not obviously constrict on both sides, apex bifurcated, with membranous plate; cornutus curved.

Distribution. China (Hunan, Fujian).

***Archischoenobius nanlingensis* Chen, Song & Wu, 2007** (Figs 100, 110, 119)

Archischoenobius nanlingensis Chen, Song & Wu, 2007. *Oriental Insects*, 41: 261. Type-locality: China, Guangdong.

Description. Hindwing greyish white at posterior portion. In male genitalia, juxta constrict on both sides, apex bifurcated, with membranous plate; cornutus curved.

Distribution. China (Guangdong).

***Archischoenobius minumus* Chen, Song & Wu, 2007** (Figs 101, 111)

Archischoenobius minumus Chen, Song & Wu, 2007. *Oriental Insects*, 41: 262. Type-locality: China, Guangxi.

Description. Hindwing suffused with black scales at posterior portion. In male genitalia, uncus with a sharp thorn at apex; juxta plate-like, constricted from base to apex, apex shortly bifurcated, with small membranous plate; cornutus curved.

Distribution. China (Guangxi).

Key to species of *Archischoenobius* in China

1. Forewing with posterior portion of postmedial line acutely bent to tornus. In male genitalia, uncus with a sharp apical thorn *A. minumus*
Forewing with posterior portion of postmedial line bluntly bent to tornus. In male genitalia, uncus without sharp apical thorn 2
2. Forewing with a narrow and strip-shaped white area between postmedial line and postmedial ground. In male genitalia, sacculus and cornutus straight *A. pallidalis*
Forewing with a broad and wedge-shaped white area between postmedial line and postmedial ground. In male genitalia, sacculus incurved and cornutus curved 3
3. Hindwing suffused with black scales at posterior portion. In male genitalia, sacculus slightly incurved, juxta not constrict on both sides *A. nigrolepis*
Hindwing pale fuscous at posterior portion. In male genitalia, sacculus deeply incurved, juxta constrict on both sides *A. nanlingensis*

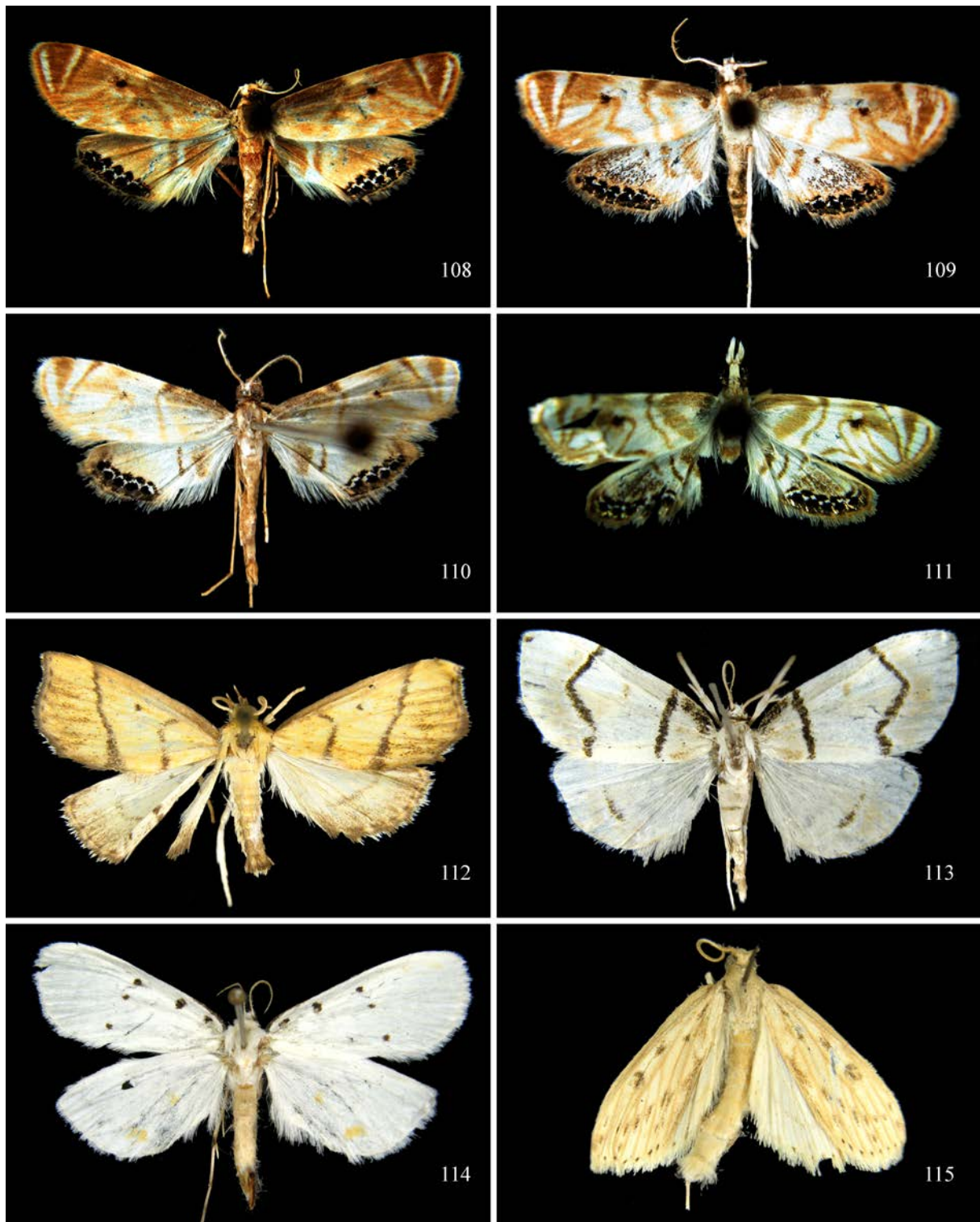
3.9 *Acropentias* Meyrick, 1890 (Figs 9, 112, 122)

Acropentias Meyrick, 1890. *Trans. Ent. Soc. Lond.*, 1890: 470. Type species: *Sparagmia obtusalis* Christoph, 1881, by monotypy (junior synonym of *Micraeschus aureus* Butler, 1878).

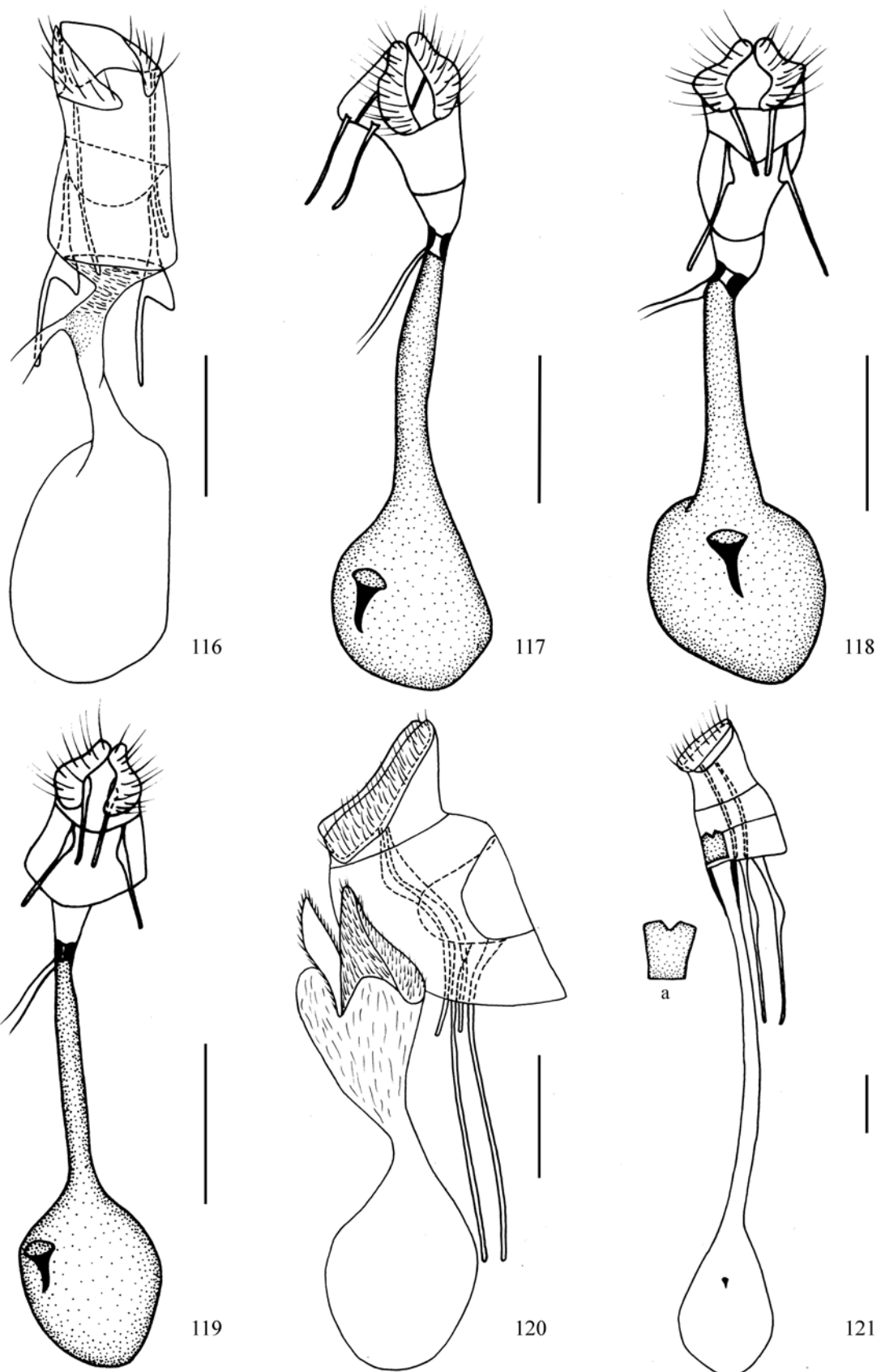
Diagnosis. The genus can be distinguished from other genera by vein R_1 stalked with R_{2+3+4} and M_2 short stalked with M_3 on forewing.

Description. Head with frons round; labial palpi porrect. A tuft of scales present at outer side of the tibiae of hindlegs.

Wings (Fig. 9). Forewing protruded at middle of outer margin; R_1 to R_4 stalked; R_5 arising from upper angle of cell; M_1 from discocellulares; M_2 and M_3 short stalked, arising from lower angle of cell; Cu_1 and Cu_2 before lower angle of cell; CuP present. Hindwing with $Sc+R_1$ and Rs stalked, arising from upper angle of cell as M_1 ; M_2 and M_3 from lower angle of cell; Cu_1 and Cu_2 before lower angle of cell.



Figs 108–115. Adults. 108. *Archischoenobius pallidalis*. 109. *A. nigrolepis*. 110. *A. nanlingensis*. 111. *A. minus*. 112. *Acropentias aureus*. 113. *Leechia sinuosalis*. 114. *Brihaspa atrostigmella sinensis*. 115. *Promacrochilo ambiguellus*.



Figs 116–121. Female genitalia. 116. *Donacaula forficellus*. 117. *Archischoenobius pallidalis*. 118. *A. nigrolepis*. 119. *A. nanlingensis*. 120. *Brihaspa atrostigmella sinensis*. 121. *Promacrochilo ambiguellus*. a. Sclerotized plate. Scale bars = 1 mm.

Male genitalia. Uncus nearly triangular, dorsal suffused with dense setae; gnathos absent; valva nearly rectangular, covered with dense setae; saccus small; coremata absent; juxta like a rolling column; aedeagus slender, without obvious sclerotized process.

Distribution. Palaearctic and Oriental Regions.

Remarks. The genus has five species at present, of which only one was reported in China so far.

***Acropentias aureus* (Butler, 1878)** (Figs 112, 122)

Micraeschus aureus Butler, 1878. *Ann. Mag. Nat. Hist.*, (5) 1: 402. Type locality: Japan.

Marimatha straminea Butler, 1879. *Ill. Type. Spec. Het. B. M.*, 3: 79.

Sparagmia obtusalis Christoph, 1881. *Bull. Soc. Nat. Mosc.*, 56: 26.

Description. Labial palpi porrect, dark fuscous, the second segment well developed, the third segment slender. Forewing with antemedial line curved like elbow; a dark fuscous spot at middle of discocellulares; postmedial line straight. Hindwing with a fuscous postmedial line present.

Material examined. IZCAS: Hainan, Jianfengling, 1♂, 25 September 1982, You-Jong Lin; Yunnan, Pingbian, Mt. Daquan, 1500 m, 2♂, 20–23 June 1956, Ke-Ren Huang.

Distribution. China (Heilongjiang, Zhejiang, Fujian, Taiwan, Hainan, Guangxi, Yunnan); Russia, Japan, Korea.

3.10 *Leechia* South, 1901 (Figs 10, 113, 123)

Leechia South, 1901. In: Leech, *Trans. Ent. Soc. Lond.*, 1901: 400. Type species: *Leechia sinuosalis* South, 1901, by original designation.

Diagnosis. The genus is distinguished from other genera by all radial veins stalked and M_2 long stalked with M_3 on forewing.

Description. Labial palpi porrect, apex pointed; maxillary palpi well developed, apex expanded.

Wings (Fig. 10). Forewing with all radial veins stalked, arising from upper angle of cell, R_5 separated firstly, then R_1 ; M_1 little below upper angle of cell; M_2 and M_3 long stalked, from lower angle of cell as Cu_1 ; Cu_2 before lower angle of cell; CuP present. Hindwing with $Sc+R_1$ and Rs stalked, from upper angle of cell as M_1 ; M_2 and M_3 long stalked, from lower angle of cell; Cu_1 from lower angle of cell; Cu_2 before lower angle of cell.

Male genitalia. Uncus broad, triangular, dorsal suffused with dense setae; gnathos absent; valva short, apex blunt; saccus small; coremata absent; juxta weakly sclerotized; aedeagus slender.

Distribution. Palaearctic and Oriental Regions.

Remarks. The genus comprises three species, including two species from China.

Key to species of *Leechia* in China

1. Hindwing with single medial line *L. bilinealis*
Hindwing with double medial lines *L. sinuosalis*

***Leechia sinuosalis* South, 1901** (Figs 113, 123)

Leechia sinuosalis South, 1901. In: Leech, *Trans. Ent. Soc. Lond.*, 1901: 400. Type locality: China, Hubei, Changyang.

Leechia formosensis Wileman & South, 1918. *Entomologist*, 3: 218. Type locality: Taiwan, China.

Description. Labial palpi porrect, slender and white, outer side mixed with fuscous scales. Forewing with postmedial line outwardly oblique to vein M_1 , inwardly oblique to Cu_2 , thence outwardly oblique to inner margin. Hindwing with double fuscous medial lines present, blurry and short. In male genitalia, uncus triangular, dorsal suffused with dense setae; gnathos absent; valva short; juxta weakly sclerotized, plate-like; coremata absent; aedeagus slender, several spine-like cornuti present at apex.

Material examined. IZCAS: Shaanxi, Ningshan, Huoditang, 1580 m, 1♂, 27 July 1998, Jian Yao; Gansu, Dangchang, Dahebagou, 1700 m, 2♂, 9 July 1998, Xue-Zhong Zhang; Gansu, Wenxian, Liujiaping, 800 m, 1♂, 27 June 1998, De-Cheng Yuan; Anhui, Xuancheng, Laodongdaxue, 1♂, 18 August 1975; Jiangxi, Dayu, 1♂, 17 August 1985, Shi-Mei Song; Hunan, Yanling, Taoyuandong, 631 m, 3♂, 7♀, 4–8 July 2008, Fu-Qiang Chen; Fujian, Da'an, 1♂, 19 June 1981,

Shi-Cheng Qi; Fujian, Mt. Wuyi, 1♂, 26 June 1982, Jiang Fan; Fujian, Sangang, 1♂, 17 August 1979; Fujian, Mt. Wuyi, Mali, 1260 m, 1♀, 30 July 2000, Shi-Mei Song; Guangdong, Nanling, 865 m, 1♂, 1♀, 15 July 2005, Fu-Qiang Chen; Sichuan, Xichang, 2♂, 31 July 1980, Bao-Lin Zhang.

Distribution. China (Shaanxi, Gansu, Anhui, Hubei, Jiangxi, Hunan, Fujian, Taiwan, Guangdong, Sichuan); Japan.

***Leechia bilinealis* South, 1901**

Leechia bilinealis South, 1901. In: Leech, *Trans. Ent. Soc. Lond.*, 1901: 400. Type locality: China, Hubei, Changyang.

Description. Forewing with postmedial line outwardly oblique to vein M_1 , thence inwardly oblique to inner margin. Hindwing with single medial line.

Material examined. None.

Distribution. China (Hubei); Japan.

Remarks. The species is very similar to *L. sinuosalis*. The type localities of both species are Changyang, Hubei Province. An adult figure of *L. bilinealis* from BMNH was checked. The main differences between *L. bilinealis* and *L. sinuosalis* are from postmedial line on forewing and medial line on hindwing.

3.11 *Brihaspa* Moore, 1867 (Figs 11, 114, 120, 124)

Brihaspa Moore, 1868. *Proc. Zool. Soc. Lond.*, 1867: 666; Hampson, 1896. *Fauna Brit. Ind. Moths*, 4: 43. Type species: *Brihaspa atrostigmella* Moore, 1868, by monotypy.

Diagnosis. The genus is distinguished from other genera by vein Sc and R_1 anastomosed but separated terminally, R_2 stalked with R_{3+4} on forewing.

Description. Head with frons protruded; labial palpi porrect, covered with coarse scales; maxillary palpi slender, apex expanded; legs slender; female usually with anal tuft on the seventh abdominal segment.

Wings (Fig. 11). Forewing broad, apex round; Sc and R_1 anastomosed long and separated terminally; R_2 and R_{3+4} stalked; R_5 from upper angle of cell; M_1 from discocellulares, closed to R_5 ; M_2 and M_3 from lower angle of cell, separated basally; Cu_1 from nearby lower angle of cell; Cu_2 before lower angle of cell. Hindwing with $Sc+R_1$ and Rs long stalked; M_1 shortly stalked with $Sc+R_1$ and Rs ; M_2 and M_3 from lower angle of cell, separated basally; Cu_1 from nearby lower angle of cell; Cu_2 before lower angle of cell.

Male genitalia. Uncus near triangular; gnathos semicircular; valva with a hooked transtilla; juxta U-shaped; coremata present; aedeagus slender.

Female genitalia. Anal papillae slender, with long setae; apophyses anterioris and posterioris slender; ostium bursae broad, membranous, wrinkled, with membranous plate; ductus bursae short and slender; corpus bursae round, membranous.

Distribution. Oriental Region.

Remarks. The genus comprises seven species, including one species from China.

***Brihaspa atrostigmella sinensis* Caradja, 1933** (Figs 114, 120, 124)

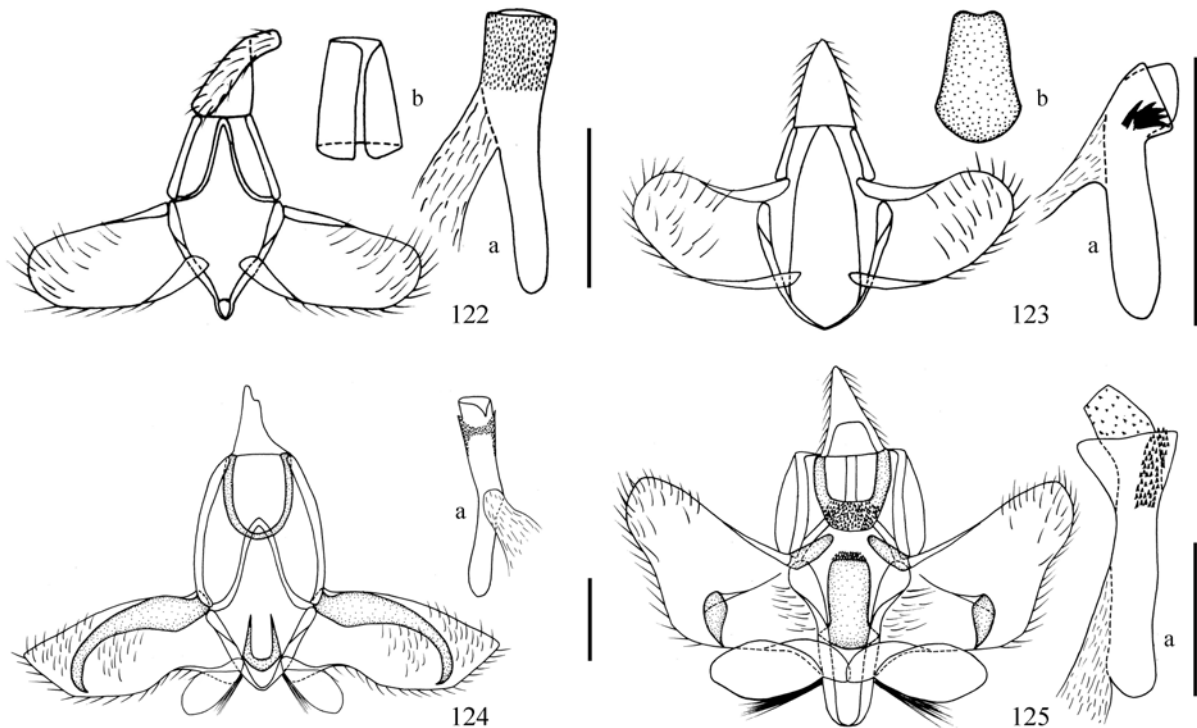
Brihaspa atrostigmella sinensis Caradja, 1933. In: Caradja & Meyrick, *Dt. Ent. Z. Iris*, 47: 142. Type locality: China, Guangdong.

Description. Labial palpi porrect, slender and dark fuscous, under side white. Female with anal tuft dark rufous. Forewing white, two black spots present at both basal quarter and middle of upper margin of cell, another three black spots present at upper angle of cell, lower angle of cell and below the middle of Cu_2 ; two short pale yellow lines present outside discocellulares. Hindwing white; three yellow patches separately present at lower angle of cell, middle of Cu_1 and anal angle. In male genitalia, gnathos semicircular; valva with a sclerotized hooked transtilla; juxta U-shaped; coremata present. In female genitalia, ostium bursae membranous, wrinkled, two membranous plates present at ostium bursae, suffused with dense setae.

Material examined. IZCAS: Guangdong, Mt. Dinghu, 1♂, 1♀, 13–21 August 1979, Ying-Shu Xie, Shao-Kun Du, Shi-Yang Xia; Guangdong, Fengkai, Heishiding, 1♂, 30 May 1984, Xiang Yu; Guangdong, Fengkai, Heishiding, 1♀, 23 May 1986, De-An Lan; Guangxi, Jinxiu, Luoxiang, 200 m, 1♂, 5♀, 15 May 1999, Hong-Xiang Han; Guangxi, Fangcheng, Fulong, 300–350 m, 20♂, 2♀, 23–24 May 1999, Wen-Zhu Li, De-Cheng Yuan; Guangxi, Fangcheng, Fulong, 550 m, 1♂, 1♀, 26 May 1999, Yan-Zhou Zhang; Guangxi, Shangsi, Hongqilinchang, 300 m, 1♂, 27 May 1999, Yan-Zhou Zhang;

Guangxi, Shangsi, Nanping, 350 m, 1♂, 9 June 2000, Chao-Dong Zhu; Guangxi, Fangcheng, Banba, 250 m, 2♂, 3 June 2000, Wen-Zhu Li; Guangxi, Jinxiu, Jinzhong Road, 1100 m, 1♂, 12 May 1999, Fu-Sheng Huang; Yunnan, Shuangjiang, 888 m, 2♂, 2–5 June 1980, Wang Zhang; Yunnan, Kunming, Mt. Xi, 1♂, 2 March 1957, Shu-Yong Wang; Yunnan, Xishuangbanna, Mengyang, 1600 m, 1♂, 2 April 1957, Shu-Yong Wang; Yunnan, Jingdong, 1170 m, 1♀, 17 June 1956; Yunnan, Shiping, Jiaoyuan, 1♀, 21 June 1979, Yong-Jie Liu.

Distribution. China (Guangdong, Guangxi, Yunnan); India, Bhutan, Bangladesh, Myanmar, Vietnam, Thailand.



Figs 122–125. Male genitalia. a. Aedeagus. b. Juxta. 122. *Acropentias aureus*. 123. *Leechia sinuosalis*. 124. *Brihaspa atrostigmella sinensis*. 125. *Promacrochilo ambiguellus*. Scale bars = 1 mm.

3.12 *Promacrochilo* Bleszynski, 1962 (Figs 12, 115, 121, 125)

Promacrochilo Bleszynski, 1962. *Coridon* (A), 3: 3. Type species: *Chilo ambiguellus* Snellen, 1890, by original designation (replacement name for *Macrochilo* Hampson, 1896).

Macrochilo Hampson, 1895. *Proc. Zool. Soc. Lond.*, 1895: 950. Type species: *Chilo ambiguellus* Snellen, 1890, by original designation (a junior homonym of *Macrochilo* Hübner, 1816).

Diagnosis. The genus is distinguished from other genera by vein R_5 shortly stalked with R_{2+3+4} .

Description. Head with frons protruded; labial palpi porrect, covered with coarse scales; maxillary palpi expanded; patagia of prothorax with long tuft.

Wings (Fig. 12). Forewing elongate, apex pointed; R_1 nearby upper angle of cell, close to R_2 ; R_2 to R_5 stalked, R_5 separated firstly, then R_2 ; M_1 from discocellulares, close to R_5 ; M_2 and M_3 from lower angle of cell; Cu_1 and Cu_2 before lower angle of cell. Hindwing with $Sc+R_1$ and Rs stalked, from upper angle of cell as M_1 ; M_2 and M_3 from lower angle of cell; Cu_1 and Cu_2 before lower angle of cell.

Male genitalia. Uncus near triangular, covered with setae dorsally; gnathos semicircular, apex suffused with minute spines; tegumen broad, with sclerotized dorsal ridge reversed Y-shaped; valva broad, a sclerotized process present at

sacculus; vinculum broad; saccus round; coremata present; juxta plate-like, sclerotized; aedeagus strong, vesica with minute spinules, manica with a tuft of coarse spines; ductus ejaculatorius from the terminal of aedeagus.

Female genitalia. Anal papillae slender, covered with setae; apophyses anterioris and posterioris slender; ductus bursae membranous, much longer than corpus bursae; corpus bursae round.

Distribution. Oriental Region.

Remarks. The genus comprises only one species, distributed in China and south Asia.

***Promacrochilo ambiguellus* (Snellen, 1890)** (Figs 115, 121, 125)

Chilo ambiguellus Snellen, 1890. *Trans. Ent. Soc. Lond.*, 1890: 642. Type locality: India.

Pydna notata Swinhoe, 1891. *Trans. Ent. Soc. Lond.*, 1891: 479. Type locality: India.

Description. Labial palpi porrect, yellow. Female much larger than male. Forewing yellow, with yellowish brown scales suffused along veins; three dark brown spots present at middle of cell, discocellulares and basal trisection of vein 1A+2A; a series of dark brown spots from apical costa to middle of inner margin. Hindwing with a blurry postmedial line from costa to inner margin. In male genitalia, gnathos semicircular, apex suffused with minute spines; valva broad, a semicircular process present at sacculus; manica with a tuft of coarse spines. In female genitalia, ostium bursae short and thin, a sclerotized plate present; ductus bursae membranous, 3 times as long as corpus bursae; corpus bursae with a spine-like signum.

Material examined. IZCAS: Hainan, Jianfengling, 2♂, 23 July–6 August 1981, Yuan-Fu Liu, Mao-Bin Gu; Hainan, Maorui, 1♀, 24 August 1984.

Distribution. China (Hainan); India, Nepal, Myanmar, Thailand, Malaysia.

4 Discussion

This aim of the study is to conduct a morphological revision of the Chinese Schoenobiinae. A total of 49 species are reported in this work. Descriptions for these species are mainly based on materials checked. Over 2000 specimens were checked, and more than 700 specimens were dissected during this research. Some minor discussions between species are provided in the taxonomic section.

4.1 Characteristics of Schoenobiinae

Generally, Schoenobiinae is characterized by the reduction of proboscis, the presence of vein CuP on the forewing, scale-tuft on the seventh abdominal sternite of male, and coremata in male genitalia (Munroe, 1956; Common, 1960; Lewvanich, 1981a). However, some exceptions are present. For example, the genus *Archischoenobius* shows well developed proboscis and complex fasciae on both wings. Moreover, the vein CuP is also present in some genera of Acentropinae.

Schoenobiinae is distinguished by the presence of the scale-tuft on the seventh abdominal sternite and specialized plate-like coremata in males. Most genera in the present work share these structures, except for *Acropentias* and *Leechia*. Thus, these genera are suggested to be removed from Schoenobiinae in the following discussion.

Schoenobiinae may also be separated from other subfamilies by the membranous sac on the prothorax of larvae (Passoa & Habeck, 1987). The membranous sac is located anterior to the prothoracic coxae on the midline, and was found in *Rupela*, *Schoenobius*, *Scirpophaga*, and *Donacaula* (Passoa & Habeck, 1987).

4.2 Some closely related genera in Schoenobiinae

Six genera are closely related in Schoenobiinae, namely, *Schoenobius*, *Scirpophaga*, *Catagela*, *Donacaula*, *Niphadoses*, and *Helonastes*. These genera have similar venation, wing patterns and genital structures. The main differences of these genera are listed in Table 1 (Lewvanich, 1981a). Moreover, most Schoenobiinae species have dorsal ridges on tegumen that are somewhat X-shaped, except in *Scirpophaga* (Table 2). The genus was divided into seven groups of species by Lewvanich (1981a). The *praelata*-group, *incertulas*-group, and *whalleyi*-group show different

patterns in dorsal ridge with other groups of species and genera. In addition, the traits of Sc and R₁ on the forewing is not stable in *Scirpophaga*, *Donacula*, and *Niphadoses*. Thus, a more comprehensive work should be performed to characterize these genera in the future.

Table 1. Differences among genera *Schoenobius*, *Scirpophaga*, *Catagela*, *Donacula*, *Niphadoses* and *Helonastes*.

Characters	<i>Schoenobius</i>	<i>Scirpophaga</i>	<i>Catagela</i>	<i>Donacula</i>	<i>Niphadoses</i>	<i>Helonastes</i>
R ₂ and R ₃₊₄ of forewing	Separated	Separated	Separated	Stalked	Separated	Separated
Sc and R ₁ on forewing	Separated	Anastomosed or separated	Separated	Anastomosed or separated	Anastomosed or separated	Separated
Dorsal ridge of tegumen	X-shaped	Triangular, rectangular or X-shaped	X-shaped	X-shaped	X-shaped	Two subparallel lines
Juxta	Apex raised	Apex incurved or flat	Apex elongated	Apex raised	Apex incurved or flat	Apex flat
Inception of ductus seminalis	Close to ostium bursae	Middle of ductus bursae or close to ostium bursae	Close to ostium bursae	Close to ostium bursae	Close to ostium bursae	Close to corpus bursae

Table 2. Differences among the species groups of *Scirpophaga*.

Characters	<i>S. praelata</i>	<i>S. excerptalis</i>	<i>S. occidentella</i>	<i>S. lineata</i>	<i>S. incertulas</i>	<i>S. gotoi</i>	<i>S. whalleyi</i>
Sc and R ₁ on forewing	Separated	Anastomosed	Separated	Anastomosed	Separated	Anastomosed	Anastomosed
Subteguminal process	Plate-like	Spine-like	Lobe-like	Plate-like	Spine-like	Plate-like	Membranous
Dorsal ridge of tegumen	Rectangular	X-shaped	X-shaped	X-shaped	Triangular	X-shaped	Triangular
Corpus bursae	Dense spines	Dense spines	Membranous	Dense spines	Dense spines	Dense spines	Membranous
Inception of ductus seminalis	Middle of ductus bursae	Close to ostium bursae	From ostium bursae	Close to ostium bursae	Close to ostium bursae	Close to ostium bursae	Close to ostium bursae

4.3 Status of some genera in Schoenobiinae

The genera, *Acropentias*, *Leechia*, *Brihaspa*, and *Promacrochilo* have obvious differences with eight other genera of Schoenobiinae in China. These genera have long been considered as groups of Schoenobiinae (Hampson, 1895). Observations of male genitalia show that both *Acropentias* and *Leechia* have no gnathos, whereas both *Brihaspa* and *Promacrochilo* have semicircular gnathos. These characteristics are uncommon in Schoenobiinae. Some adjustments should be done for natural Schoenobiinae.

The genus *Acropentias* was previously transferred to Pyraustinae by Fletcher and Nye (1984). Shaffer advised the transfer of this genus to the subfamily Spilomelinae in the electronic database *Butterflies and Moths of the World* (Butmoth) (Pitkin & Jenkins, 2004). Lewvanich (1981a) excluded *Leechia* from Schoenobiinae but did not suggest a subfamilial placement. The genus *Brihaspa* was placed in Schoenobiinae. The genus *Promacrochilo* was established to replace the junior name *Macrochilo* Hampson, 1895, which was established in Crambinae. It was transferred to Schoenobiinae by Bleszynski (1962).

After comparing and contrasting the characteristics of these genera (Table 3), those four genera, *Acropentias*, *Leechia*, *Brihaspa*, and *Promacrochilo*, are suggested to be removed from Schoenobiinae. Their status should be revised in the future.

Table 3. Differences among genera *Acropentias*, *Leechia*, *Brihaspa*, *Promacrochilo* and *Schoenobiinae*.

Characters	<i>Schoenobiinae</i>	<i>Acropentias</i>	<i>Leechia</i>	<i>Brihaspa</i>	<i>Promacrochilo</i>
Proboscis	Reduced	Reduced	Reduced	Reduced	Reduced
Ocelli	Present	Present	Present	Present	Present
Chaetosema	Present	Absent	Absent	Present	Present
Labial palpi	Porrect	Porrect	Porrect	Porrect	Porrect
Anal tuft of female	Present	Absent	Absent	Present	Present
scale tufts on male S7	Present	Absent	Absent	Present	Present
Venation of forewing	R ₁ before upper angle of cell; M ₂ and M ₃ separated from lower angle of cell; cup present	R ₁ from upper angle of cell; M ₂ and M ₃ stalked; cup absent	R ₁ from upper angle of cell; M ₂ and M ₃ stalked; cup present	R ₁ before upper angle of cell; M ₂ and M ₃ separated from lower angle of cell; cup present	R ₁ before upper angle of cell; M ₂ and M ₃ separated from lower angle of cell; cup present
Praecinctorium	Bilobate	Bilobate	Bilobate	Bilobate	Bilobate
Uncus	Beak-like	Triangular	Triangular	Near triangular	Near triangular
Gnathos	Beak-like	Absent	Absent	Semicircular	Semicircular
Coremata	Present	Absent	Absent	Present	Present
Ostium bursae	Sometimes sclerotized or with sclerotized plate	-	Sclerotized	With two separated membranous plates and dense setae present	With a sclerotized plate present
Corpus bursae	Well developed	-	Reduced	Well developed	Well developed
Host plants	Gramineae, cyperaceae, juncaceae	-	-	Gramineae	Gramineae

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