

## The Genus *Pammene* Hübner (Lepidoptera: Tortricidae) from Korea, with Descriptions of Two New Species

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**Yang-Seop Bae and Kyu-Tek Park (1998)** The genus *Pammene* Hübner (Lepidoptera: Tortricidae) from Korea, with descriptions of two new species. *Zoological Studies* 37(4): 291-301. Nine species of the genus *Pammene* Hübner are recognized from Korea. Among them, 2 new species, *P. (Pammene) blanda* and *P. (P.) soyoensis*, are described, and 5 species, *P. (P.) ignorata* Kuznetsov, *P. (P.) germmana* (Hübner), *P. (P.) adusta* Kuznetsov, *P. (P.) shicotanica* Kuznetsov, and *P. (P.)* sp. are newly recorded from Korea. Keys to all known species of the genus, based on the external and male genitalia characters are provided. Illustrations of adults, male abdominal scent organs, and genitalia of both sexes are given. All available host plants are listed.

**Key words:** Taxonomy, Lepidoptera, Tortricidae, *Pammene*, Korea.

Genus *Pammene* Hübner, [1825] is one of the genera related to *Grapholita* Treitschke, 1829, belonging to the tribe Grapholitini of the subfamily Olethreutinae. The genus is mostly distributed in the Holarctic region, with about 100 species recorded from the Old World. The members are usually variable in maculation and coloration of forewings. The Korean fauna of *Pammene* has been poorly known. The 1st recorded species from Korea was *P. japonica* Kuznetsov, which was included in the "Microlepidoptera of Korea" by Park (1983), while Byun and Park (1993) recently added *P. orientana* Kuznetsov and *P. griseana* Walsingham. From our study on the Korean Tortricidae, 9 species of the genus *Pammene* are now recognized from Korea. Among them, 2 species are described as new, and 5 species are newly recorded from Korea. Description and redescriptions of the genus and species are provided, with illustrations of adults, male scent organs and genitalia, and keys to the species based on the external and genitalia characters being given.

Abbreviations for collection and provincial

names are as follows: ASTI, Agricultural Science and Technology Institute, Suweon; CIS, Center for Insect Systematics, Kangwon National University, Chunchon; FRI, Forest Research Institute, Seoul; UIB, Department of Biology, University of Incheon, Incheon; GG, Gyunggi; GW, Gangwon; CN, Chungnam; CB, Chungbug; JN, Jeonnam; JB, Jeonbug; GN, Gyungnam; GB, Gyungbug; and CJ, Cheju.

### SYSTEMATIC ACCOUNTS

#### Genus *Pammene* Hübner, [1825]

- Pammene* Hübner, [1825], Verz. bekannter Schmett: 378. Type species: *Tortrix trauniana* [Denis and Schiffermüller], 1775.
- Eucelis* Hübner, [1825], ibid: 394. Type species: *Tortrix mediana* [Denis and Schiffermüller], 1775 = *Pyralis aurana* Fabricius, 1775.
- Palla* Billberg, 1820, Enumeratio Insect: 90. Type species: [*Phalaena*] *rhediiella* Clerck, 1759.
- Hemimene* Hübner, [1825], Verz. bekannter Schmett: 378. Type species: *Pyralis populana* Fabricius, 1787.
- Pseudotomia* Stephens, 1829, Syst. Cat. Br. Insects 2: 175. Type species: *Pseudotomia strobilella*: Stephens, 1828 = [*Tortrix*] *argyraga* Hübner, [1799].

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*Heusimene* Stephens, 1834, Ill. Br. Ent., *Haustellata*, 4: 96. Type species: *Tortrix fimbriana* Haworth, [1811] = *Pammene inquilana* Fletcher, 1938.

*Pyrodes* Guenée, 1845, Anns Soc. ent. Fr. (2) 3: 187. Type species: *Epiblema rhediana* Hübner, [1825] = [*Phalaena rhediella* Clerck, 1759].

*Trycheris* Guenée, 1845, *ibid*: 190. Type species: *Tortrix mediana* [Denis and Schiffermüller], 1775 = *Pyralis aurana* Fabricius, 1775.

*Orchemia* Guenée, 1845, *ibid*: 192. Type species: *Orchemia gallicana* Guenée, 1845.

*Hemerosia* Stephens, 1852, List Specimens Br. Animals Colln. Br. Mus. 10: 6. Type species: [*Phalaena*] *rhediella* Clerck, 1759.

*Phthoroblastis* Lederer, 1859, Wien. ent. Mschr. 3: 370. Type species: *Tortrix ephippiana* Hübner, [1817] = *Pyralis populana* Fabricius, 1787.

*Sphaeroeca* Meyrick, 1895, Handbook Br. Lepidopt: 490. Type species: *Pseudotomia (Eudemis) obscurana* Stephens, 1834.

*Metasphaeroeca* Fernald, 1908, Genera Tortricidae: 62. Type species: *Pseudotomia (Eudemis) obscurana* Stephens, 1834.

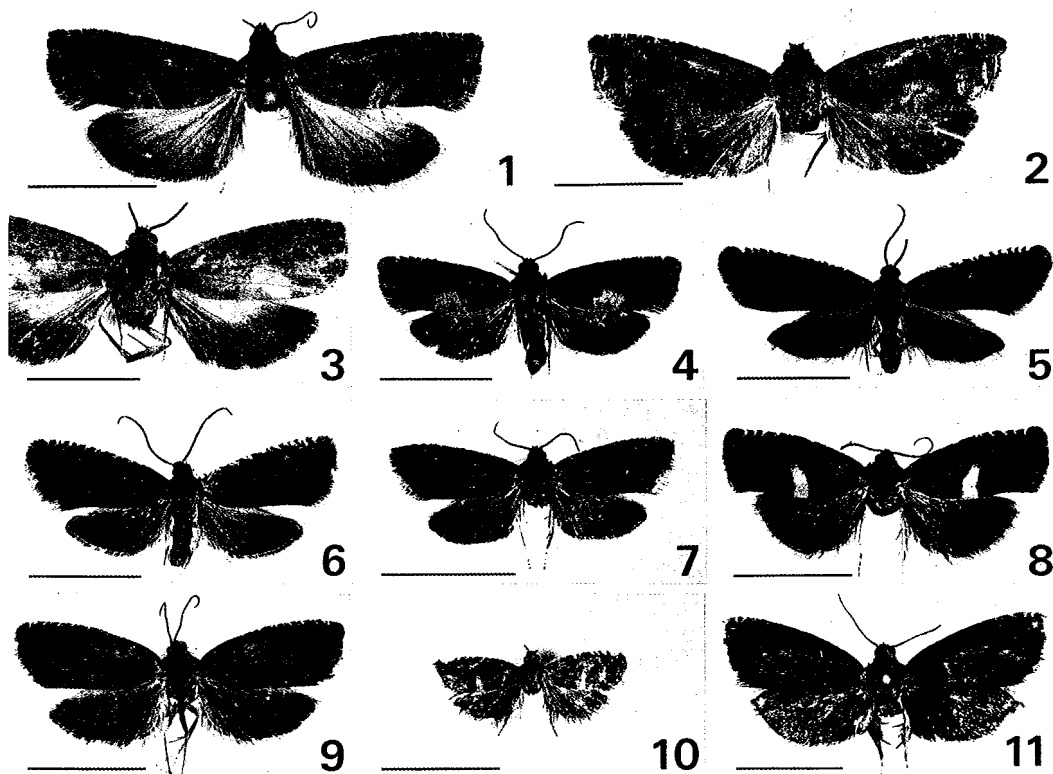
**Adult** (Figs. 1-11): Small to medium in size; wing expanse 8-18 mm. Head normal tortricid type; face smooth. Antenna filiform, about 0.7 times the length of forewing. Labial palpus ascending; 2nd segment densely clothed with long scales

beneath. Forewing elongate: costa with 4 to 8 pairs of whitish costal strigulae from apex to basal 1/4; ground color creamy white to fuscous gray, suffused with dark scales; markings reduced to some elements of typical pattern of the tribe Grapholitini: dorsal blotch and ocelloid patch usually well defined, sometimes rudimentary in *germana* (Hübner), *adusta* Kuznetsov, *soyoensis* sp. nov. and *shicotanica* Kuznetsov; all 12 veins separated; chorda and M stem well preserved; R<sub>4</sub> from upper angle of discal cell to costa. Hindwing with Rs and M<sub>1</sub> coalescent in male, separate in female; M<sub>3</sub> and CuA<sub>1</sub> usually stalked at middle; anal veins well developed.

**Male scent organ** (Figs. 12-19): Transverse rows of scales usually present on 6th and 7th tergites, sometimes with 4th tergite. Scale-patches sometimes reduced or absent.

**Male genitalia** (Figs. 20-27): Common characters for the tribe Grapholitini: valva simple, with variably developed neck and angle; aedeagus bearing ventral prominence or process, sometimes reduced; cornuti non-deciduous, spine-like.

**Female genitalia** (Figs. 28-33): Postvaginal plate of sterigma concave, with lateral edges lim-



**Figs. 1-11.** *Pammene* spp., adults: 1-2. *P. (Pammene) griseana* Walsingham, ♀; 3. *P. (P.) orientana* Kuznetsov, ♂; 4. *P. (P.) ignorata* Kuznetsov, ♂; 5-6. *P. (P.) germana* (Hübner), ♂; 7. *P. (P.) adusta* Kuznetsov, ♂; 8. *P. (P.) blanda* Bae and Park, sp. nov., ♂; 9. *P. (P.) shicotanica* Kuznetsov, ♀; 10. *P. (P.)* sp.; 11. *P. (P.) soyoensis* Bae and Park, sp. nov., ♂. Scale bars = 5 mm.

ited by inner ribs, often expanding laterally into narrow plates; anterior edges in many species expanding, fused entirely with 7th sternites, occasionally producing lateral processes; ostium bursae protected by sclerotic cup or funnel fused with sterigma; ductus bursae very short, anteriorly sclerotized; ductus seminalis very broad, originating just from anterior part of sclerite of ductus bursae; signa well developed. Seventh sternite variably sclerotized, with elongated lateral portions.

**Biology:** Larvae chiefly feed on fruits, sometimes catkins, branches, tissues under bark of various arboreal plants, belonging to Fagaceae, Rosaceae, Salicaceae, Aceraceae, and Pinaceae. Several species were found in galls of wasps. Many species make injurious damage horticultural crops and forests (Kuznetsov 1978).

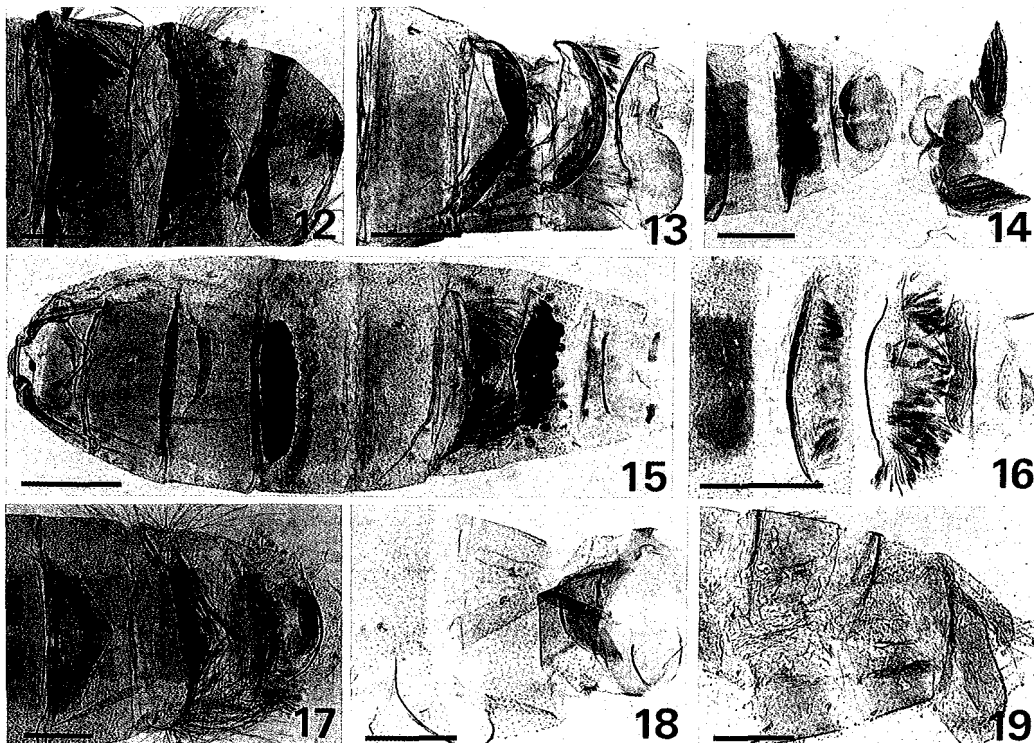
**Distribution:** Holarctic, Oriental, and Tropical Regions. About 100 species occur in Palaearctic region.

**Remarks:** According to Razowski (1989), the autapomorphies of the genus *Pammene* are as follows: the presence of ventral prominence or process of the aedeagus, the structure of sterigma, especially the occurrence of the rib limiting ventral edges of the marginal plate, and probably also the

structure of the subgenital sternite. We agree with his opinion. This genus can be divided into 2 subgenera, *Pammene* Hübner and *Eucelis* Hübner, based on differences of venations. The subgenus *Pammene* can be separated from the subgenus *Eucelis* by the following characters: male hindwing with veins Sc+R<sub>1</sub> and Rs stalked beyond median cell, in female Sc+R<sub>1</sub> and Rs separated throughout; while subgenus *Eucelis* is characterized by the hindwing of both sexes with veins Sc+R<sub>1</sub> and Rs throughout separated. The Korean species dealt with here belong to the subgenus *Pammene*.

**Key to the Korean species of *Pammene* Hübner based on external characters**

1. Forewing with dorsal blotch ..... 2  
Forewing without dorsal blotch ..... 6
2. Dorsal blotch large, subquadrate ..... 3  
Dorsal blotch small, consisting of 1 to 4 streaks ..... 4
3. Hindwing dark brown, with white-yellowish patch at basal 1/2 ..... *orientana*  
Hindwing light fuscous, paler basally ..... *ignorata*
4. Dorsal blotch consisting of 2 pairs of white streaks or ill defined ..... *griseana*  
Dorsal blotch consisting of 1 streak ..... 5
5. Wing expanse 13-14 mm; dorsal blotch broad .....  
..... *blanda* sp. nov.  
Wing expanse 8-10 mm; dorsal blotch narrow ..... sp.



**Figs. 12-19.** *Pammene* spp., male abdominal scent organ: 12. *P. (Pammene) orientana* Kuznetsov; 13. *P. (P.) griseana* Walsingham; 14. *P. (P.) ignorata* Kuznetsov; 15. *P. (P.) germana* (Hübner); 16. *P. (P.) adusta* Kuznetsov; 17. *P. (P.) blanda* Bae and Park, sp. nov.; 18. *P. (P.) soyoensis* Bae and Park, sp. nov.; 19. *P. (P.)* sp. Scale bars = 0.5 mm.

- 6. Hindwing with white-ocherous androconial fold on dorsal margin ..... *soyoensis* sp. nov.
- Hindwing without such a fold ..... 7
- 7. Head ochereous; costal strigulae well defined .....  
..... *germmana*
- Head ochereous gray or fuscous gray; costal strigulae ill defined ..... 8
- 8. Head fuscous gray; labial palpus pale gray; wing expanse 10-12 mm ..... *adusta*
- Head and labial palpus grayish ocher; wing expanse 13 mm ..... *shicotanica*

**Key to the Korean species of *Pammene* Hübner based on male genitalia characters**

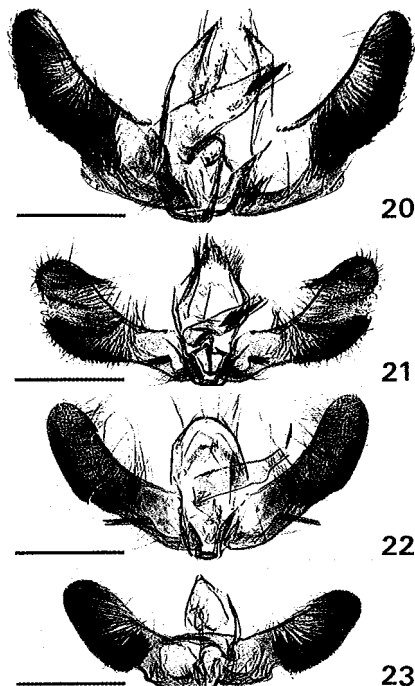
- 1. Sacculus with rounded or produced angle, and without spines at upper margin ..... 2
- Sacculus without such an angle, and with 4 to 6 stout spines at upper margin ..... 7
- 2. Sacculus expanded outwardly, forming a lobe ..... 3
- Sacculus not expanded outwardly ..... 5
- 3. Valva without narrow neck. Aedeagus long and broad (base about 0.8 times as wide as cucullus) ..... *orientana*
- Valva with narrow neck. Aedeagus narrow ..... 4
- 4. Aedeagus long, straight, cylindrical .....  
..... *Pammene (Pammene)* sp.
- Aedeagus short, narrowed dorsally, wavy at ventral side ..... *germmana*
- 5. Aedeagus with a large, membranous ventral process at apical 1/3 ..... *adusta*
- Aedeagus without such a process ..... 6
- 6. Sacculus densely with spine cluster on middle portion. Aedeagus with about 25 short, stout cornuti .....

- ..... *blanda* sp. nov.
- Sacculus sparsely with long spines on middle portion. Aedeagus with 4 medium-sized cornuti .....  
..... *soyoensis* sp. nov.
- 7. Cucullus broad, concave at lower edge of basal 2/3; sacculus with 4 to 6 stout spines ..... *griseana*
- Cucullus narrow, not concave at lower edge; sacculus with 3 stout spines ..... *ignorata*

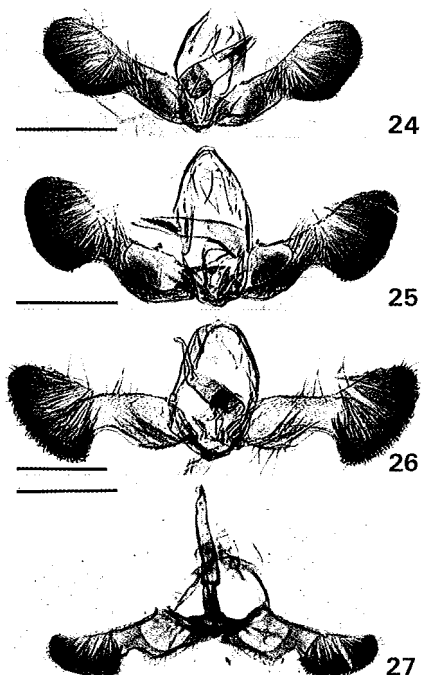
***Pammene (Pammene) orientana* Kuznetsov (Figs. 3, 12, 20)**

*Pammene orientana* Kuznetsov, 1960. Ent. Obozr. 39: 194, fig. 9, (Type locality: Amur, Russia); Danilevsky and Kuznetsov, 1968, 358-359, figs. 223, 228-229; Kawabe, 1982, 1: 147, 2: 180, pl. 30, fig. 38; Byun and Park, 1993: 202, figs. 3, 17.

**Adult:** Wing expanse: ♂ 17 mm (Fig. 3), ♀ 15-17 mm. Head and thorax black, mixed with creamy white. Antenna black, with whitish annulations. Labial palpus whitish gray; terminal segment rather long, mixed with black. Forewing narrow, with elongated termen; ground color dark fuscous, darker costally, suffused with reddish orange on apical 1/3; basal and sub-basal fasciae confluent, irrorated with creamy white; median fascia indistinctly developed, slender, irregularly with blackish dots; costa with 3 well defined yellowish-white strigulae near apex, and indistinctly with 4 or 5



**Figs. 20-23.** *Pammene* spp., male genitalia: 20. *P. (Pammene) orientana* Kuznetsov; 21. *P. (P.) griseana* Walsingham; 22. *P. (P.) ignorata* Kuznetsov; 23. *P. (P.) germmana* (Hübner). Scale bars = 0.5 mm.



**Figs. 24-27.** *Pammene* spp., male genitalia: 24. *P. (Pammene) adusta* Kuznetsov; 25. *P. (P.) blanda* Bae and Park, sp. nov.; 26. *P. (P.) soyoensis* Bae and Park, sp. nov.; 27. *P. (P.)* sp. Scale bars = 0.5 mm.

pairs of whitish strigulae from apex to basal 1/4, and bearing 2 slender metallic-lead streaks inwards; dorsal blotch large, subquadrate, scattered with whitish-yellow; ocelloid patch absent; cilia dark gray, with a blackish subbasal line concave below apex. Hindwing dark fuscous, with whitish-yellow patch at basal 1/2; cilia pale grayish ocher, with a dark subbasal line.

**Male scent organ** (Fig. 12): Transverse rows of scales present on 6th and 7th tergites: scales of the former broader than those of the latter; scales of the 7th tergite filiform, additionally bearing lanceolate scale tufts posteriorly.

**Male genitalia** (Fig. 20): Tegumen protruding posteriorly. Valva long and broad, sclerotized; cucullus long, bearing dense stout spines at lower edge; sacculus well sclerotized, with produced angle representing a lobe, and sparsely with long spines. Aedeagus long and broad, the base about 0.8 times as wide as cucullus, narrowed at apical 1/3, ventral prominence ill defined, with numerous stout cornuti.

**Female genitalia**: See Byun and Park (1993). Papillae anales broad. Apophyses anteriores as

long as apophyses posteriores. Ostium bursae strongly sclerotized, U-shaped. Ductus bursae extremely short. Corpus bursae semiovate; signa with 2 push-pin like-sclerites; appendix bursa present.

**Materials examined**: [GW]- 1 ♂, Mt. Taebaek, 27 June 1996 (YS Bae, MK Paek, BW Lee, and NH Ahn), UIB, gen. sl. no. UIB-171. [GG]- 1 ♀, Gwangleung, 19 May 1985 (KJ Weon), CIS; 1 ♀, Gwangleung, 17 May 1988 (KT Park), CIS; 1 ♀, Gwangleung, 3 June 1988 (KT Park), CIS; 1 ♀, Mt. Dodram, near Incheon, 19 May 1990 (KT Park), CIS. [JN]- 1 ♀, Mt. Jiri, 29 May 1982 (CM Kim), CIS.

**Flight period**: May to June.

**Distribution**: Korea (GW, GG, JN), Japan, and Russia (Amur).

**Host plant**: Unknown in Korea. *Quercus mongolica* Fisch (Fagaceae) in Russia (Danilevsky and Kuznetsov 1968).

**Remarks**: This species is easily distinguished from the other known species of the genus by the following characters: hindwing orangish yellow at basal 1/2; long broad valva and aedeagus; sacculus well sclerotized, with produced angle.

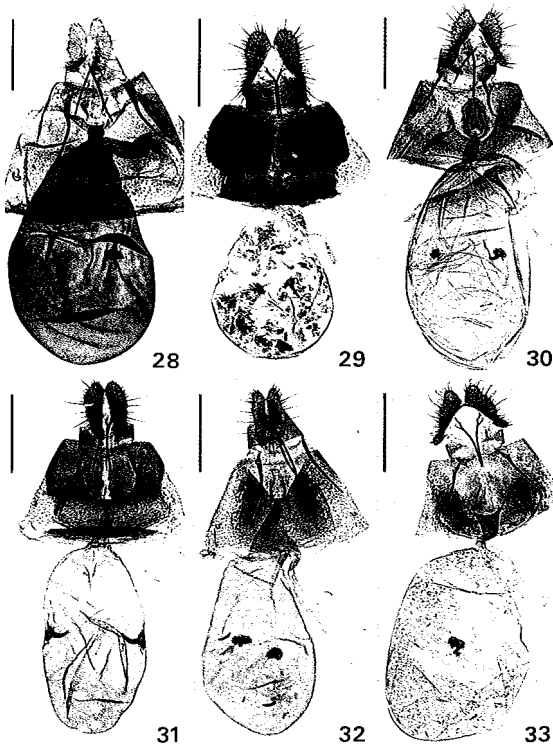
### *Pammene (Pammene) griseana* Walsingham (Figs. 1, 2, 13, 21, 28)

*Pammene griseana* Walsingham, 1900. Ann. Mag. Nat. Hist. (7)6: 436, (Type locality: Japan); Inoue, 1954: 91; Obraztsov, 1960: 120, 124; Danilevsky and Kuznetsov, 1968: 429-430, fig. 309; Byun and Park, 1993: 203, figs. 4, 11.

*Pammene (P.) griseana*: Kawabe, 1982: 2: 180.

*Pammene nemorosa* sensu Park and Ahn (nec Kuznetsov), 1987: 182, fig. 3.

**Adult**: Wing expanse: ♂ ♀ 13.5-18 mm in spring generation, ♂ ♀ 10-11.5 mm in late summer generation (Figs. 1, 2). Head, labial palpus and thorax dark gray, sprinkled with whitish-tipped scales. Antenna dark gray or pale ocherous gray. Forewing usually narrow, sometimes broad; ground color creamy white, suffused with dark gray, and scattered with whitish-tipped scales; fasciate markings brownish or dark gray; basal patch rather distinct, its outer edge strongly angulated at middle; median fascia slender, broader dorsally, irregularly with blackish dots; costa with 6 or 7 pairs of whitish strigulae from apex to basal 1/4, the apical 1 defined and widely separated; dorsal blotch defined or ill defined, consisting of 2 pairs of whitish streaks; ocelloid patch sprinkled with yellow, usually containing 4 to 6 black dots, and with 2 plumbeous streaks on inner and outer margins; cilia dark gray, with a broad blackish subbasal line,



**Figs. 28-33.** *Pammene* spp., female genitalia: 28. *P. (Pammene) griseana* Walsingham; 29. *P. (P.) germmana* (Hübner); 30. *P. (P.) adusta* Kuznetsov; 31. *P. (P.) blanda* sp. nov.; 32. *P. (P.) shicotanica* Kuznetsov; 33. *P. (P.)* sp. Scale bars = 0.5 mm.

sometimes interrupted by 1 or 2 ochreous spots below apex. Hindwing brownish gray, paler basally; cilia gray, paler dorsally, with a dark subbasal line.

**Male scent organ** (Fig. 13): Transverse rows of scales present on 6th and 7th tergites: scales of the former filiform; those of the latter spatulate.

**Male genitalia** (Fig. 21): Tegumen protuberant posteriorly, with hairs distally. Valva short, broad dorsally; cucullus concave at basal 2/3, bearing dense spines at lower edge; sacculus weak, with 4 to 6 stout spines at upper part. Aedeagus moderate in size, narrowed at apical 1/3, ventral prominence ill defined, with many cornuti.

**Female genitalia** (Fig. 28): Sterigma weakly developed, subquadrate, with sparse minute spines. Ostium bursae simple. Ductus bursae very short, about 0.3 times as long as apophyses posteriores, generally thickened. Ductus seminalis broad. Corpus bursae very large; signa rather long. Seventh sternite large, somewhat rounded, with a rib near ostium, and with a pair of shallow lateral cavities behind middle.

**Materials examined:** [GW]- 2 ♂, Chunchon, 25 Aug. 1988 (KT Park), CIS; 7 ♂, 2 ♀, Chunchon, 1 May 1989 (KT Park and BK Byun), CIS, gen. sl. nos. 3397, 3398; 2 ♂, Chunchon, 7, 29 May 1989 (KT Park), CIS, gen. sl. no. 3780; 1 ♀, Chunchon, 11 June 1989 (KT Park and BK Byun), CIS; 3 ♂, Chunchon, 16 May 1990 (KT Park), CIS, gen. sl. no. 3041; 1 ♀, Chunchon, 23 Apr. 1992 (KT Park and BK Byun), CIS, gen. sl. no. 3405; 1 ♀, Hongcheon, 20 May 1988 (KT Park), CIS. [GG]- 1 ♂, Mt. Soyo, 4 Sept. 1992 (KT Park and BK Byun), CIS, gen. sl. no. 3790; 1 ♂, Chungyangri, Seoul, 20 Sep. 1984 (KT Park), CIS, gen. sl. no. 1456; 1 ♂, Mt. Cheongyae, 19 Aug. 1976 (KT Park), ASTI; 1 ♀, Mt. Cheulma, Suweon, 26 Apr. 1976 (KT Park), ASTI; 1 ♀, Suweon, 27 May 1987 (SB Ahn), ASTI, gen. sl. no. UIB-106; 1 ♂, Yongkung Temp., Yeongjong Is., Inchon, 13 Aug. 1996 (MK Paek, BW Lee, and NH Ahn), UIB. [CB]- 1 ♀, Chonan, 3 May 1985 (DH Kim), ASTI, ex *Quercus acutissima* Carruth. [CN]- 1 ♂, Muju, 13 Aug. 1975 (KT Park), ASTI. [JN]- 1 ♂, Jungsanri, Mt. Jiri, 20 Aug. 1996 (YS Bae, MK Paek, and BW Lee), UIB. 1 ♀, Korea, 6 Sept. 1982 (DJ Park), ex gall of *Quercus* sp., CIS, gen. sl. no. 1457.

**Flight period:** Late April to mid September.

**Distribution:** Korea (GW, GG, CB, CN, JN), Japan, and Russia (Amur).

**Host plants:** *Quercus acutissima* Carruth and gall of *Quercus* sp. (Fagaceae) in Korea.

**Remarks:** This species is easily distinguished

from other species by the markings and coloration of the forewing. The species shows considerable seasonal variation in wing size: 13.5-18 mm in the spring generation, 10-11.5 mm in the late summer generation. Also individual variation occurs in the markings and coloration. The species was previously misidentified as *P. nemorosa* in Korea by Park and Ahn (1987), due to their similarities of external and genitalia characters.

***Pammene (Pammene) ignorata* Kuznetsov**  
(Figs. 4, 14, 22)

*Pammene ignorata* Kuznetsov: Danilevsky and Kuznetsov, 1968: 383-384, fig. 256, (Type locality: Siberia, Russia); Kuznetsov, 1978: 624, 626, 634. figs. 537-6, 545-2; Larsen and Vilhelmsen, 1990: 310, figs. 58-59, pl. 15, figs. 12, 17, 22.

**Adult:** Wing expanse: ♂ ♀ 12.5 mm (Fig. 4). Head dark whitish gray; vertex mixed with dark fuscous. Antenna grayish fuscous; scape creamy white at ventral side. Labial palpus whitish gray; median segment dilated; terminal segment slightly exposed. Thorax and abdomen dark fuscous, mixed with whitish-tipped scales. Forewing narrow; ground color dark brownish fuscous, irrorated and striated with black and lustrous plumbeous color; costa with 6 ill-defined pairs of yellowish-white strigulae from apex to basal 1/4, interspaces producing long and short lustrous plumbeous streaks; dorsal blotch large, subquadrate, grayish white, with a dark gray dot at dorsal margin; ocelloid patch concolorous with ground color, edged with lustrous plumbeous streaks laterally; cilia dark gray, with a blackish subbasal line. Hindwing light fuscous, paler basally; cilia ochreous, with a dark gray subbasal line.

**Male scent organ** (Fig. 14): Transverse rows of scales present on 6th and 7th tergites: scales of the former filiform; scales of the 7th tergite broader and shorter than those of 6th.

**Male genitalia** (Fig. 22): Tegumen widely protruding posteriorly. Valva long, broad; cucullus simple, with slender spines at lower edge; sacculus weak, with 3 long stout spines at upper part. Aedeagus funnel-like, narrowed at apical 1/3, ventral prominence well defined, with 8 cornuti.

**Materials examined:** [GW]- 2 ♂, Mt. Kyebang, 26 May 1996 (YS Bae, MK Paek, and BW Lee), UIB, gen. sl. no. UIB-132.

**Flight period:** Late May.

**Distribution:** Korea (GW), Russia (Siberia, Amur, Primorye) and Denmark.

**Host plant:** Unknown.

**Remarks:** The markings of the forewing of this

species are closely similar to those of *P. albuginana* (Guenée) from Europe, but this species is easily recognized from the latter in having long and stout spines at sacculus. The species is reported for the 1st time from Korea.

***Pammene (Pammene) germmana* (Hübner)**  
(Figs. 5, 6, 15, 23, 22)

*Tortrix germmana* Hübner, [1799], Sammlung eur. Schmett., Tortrices, pl. 8, fig. 47, (Type locality: Europe).

*Tortrix atropurpurana* Haworth, [1811], Lepid. Br.: 467.

*Pseudotomia (Heusimene) puncticostana* Stephens, 1834, Ill. Br. Ent., Haustellata, 4: 102.

*Stigmonota immaculana* Guenée, 1845, Anns Soc. ent. Fr. (2)3: 184.

*Grapholitha fulvifrontana* Zeller, 1849, Stettin. ent. Ztg., 10: 255.

*Stigmonota germmana*: Barrett, 1906: 244; Pierce and Metcalfe, 1922: 92, pl. 32.

*Pammene germmana*: Kennel, 1921: 699-700, pl. 24, fig. 93; Meyrick, 1928: 585; Ford, 1949: 84; Hannemann, 1961: 106, fig. 204, pl. 8, fig. 4; Danilevsky and Kuznetsov, 1968: 430-431, figs. 306, 308; Kuznetsov, 1978: 625, 629, 643, figs. 539-1, 554-1; Bradley, Tremewan, and Smith, 1979: 236-237, figs. 5, 6, pl. 40, figs. 5, 6; Larsen and Vihelmsen, 1990: 313, pl. 15, fig. 30.

*Pammene (Pammene) germmana*: Razowski, 1991: 110-111, figs. 80, 167, pl. 8, fig. 5.

**Adult:** Wing expanse: ♂ 12.5-14 mm, ♀ 14-15 mm (Figs. 5, 6). Head ochreous; vertex suffused with dark grayish fuscous. Antenna grayish fuscous, irrorated with creamy white; scape pale ochreous or creamy white at ventral side. Labial palpus pale ochreous; 2nd segment dilated; terminal segment slightly exposed. Thorax and abdomen fuscous gray. Forewing narrow; termen oblique, rather straight; ground color dark grayish fuscous, bearing plumbeous dots and streaks terminally; apex black; costa with 7 well defined pairs of yellowish-white strigulae from apex to basal 1/4, the apical 1st and 4th strigulae fused with each other, interspaces producing bluish-plumbeous streaks, the 4th plumbeous streak interrupted reaching near dorsum; dorsal blotch and ocelloid patch absent; cilia ochreous gray, with a blackish subbasal line. Hindwing light fuscous; cilia pale ochreous, with a dark gray subbasal line.

**Male scent organ** (Fig. 15): Transverse rows of scales present on 4th, 6th, and 7th tergites; scales of 4th tergite dense, lanceolate, represented with a black spot; scales of the 6th broad and long; scales of the 7th dense, lanceolate, and dark pigmented.

**Male genitalia** (Fig. 23): Tegumen weakly membranous, protruding posteriorly. Valva broad and short, with a concavity at ventral margin; cucullus ovate, densely with stout spines on lower margin; sacculus weak, with defined angle below

concavity representing a lobe. Aedeagus moderate in size, narrowed apically, wavy at ventral side, with many cornuti.

**Female genitalia** (Fig. 29): Sterigma weakly sclerotized, with 2 long protrusions laterally. Ostium bursae small and simple. Ductus bursae narrow, with long narrow sclerites. Ductus seminalis narrow. Corpus bursae large; signa moderate in size. Seventh sternite well sclerotized, deeply concave, sparsely distributed with stout spines at middle part.

**Materials examined:** [GW]- 1 ♂, Jiam-ri, 12 km N Chunchon, 9 May 1989 (KT Park), ASTI (missing abdomen); 6 ♂, 1 ♀, Mt. Kyebang, 26 May 1996 (YS Bae, MK Paek, and BW Lee), UIB, gen. sl. nos. UIB-117, UIB-108; 2 ♂, 1 ♀, Mt. Taebaek, 27 June- 1 July 1996 (YS Bae, MK Paek, BW Lee, and NH Ahn), UIB. [GG]- 1 ♀, Mt. Myungji, 25 May 1990 (KT Park), CIS, gen. sl. no. 2954; 1 ♂, Gwangleung, 13 May 1994 (BK Byun), FRI, gen. sl. no. UIB-117. [CB]- 1 ♀, Danyang, 28 July 1995 (MK Paek), UIB.

**Flight period:** Early May to July.

**Distribution:** Korea (GW, GG, CB), Japan, Russia, and Europe.

**Host plants:** Unknown in Korea. *Prunus domestica* L., *Pr.* spp. (Rosaceae) (Bradley, Tremewan, and Smith 1979); *Quercus* (Fagaceae), and *Crataegus* (Rosaceae) (Barrett 1906) in Europe.

**Remarks:** This species is similar to following species, *P. (P.) adusta* and *P. (P.) shicotanaica*, in having the fuscous-gray ground color of the forewing, but it can be separated from the latter by its very oblique termen and well defined costal strigulae of the forewing, and ochreous head. The species is reported for the 1st time from Korea.

***Pammene (Pammene) adusta* Kuznetsov**  
(Figs. 7, 16, 24, 30)

*Pammene adusta* Kuznetsov, 1972, Ent. Obozr., 51: 394, fig. 15, (Type locality: Unzen, Japan).

**Adult:** Wing expanse: ♂ 10 mm, ♀ 11-12 mm (Fig. 7). Head, antenna, thorax, and abdomen fuscous gray. Labial palpus pale gray, darker terminally. Forewing narrow; ground color fuscous gray, scattered with creamy-white-tipped scales, and bearing plumbeous dots on apical 1/3; costa with 4 to 6 ill defined yellowish-white strigulae beyond middle, interspaces producing bluish-plumbeous streaks; dorsal blotch and ocelloid patch absent; cilia ochreous gray, with a blackish subbasal line. Hindwing light fuscous; cilia pale

ocherous, with a dark gray subbasal line.

*Male scent organ* (Fig. 16): Transverse rows of scales present on 6th and 7th tergites, the scales sparse, spatulate.

*Male genitalia* (Fig. 24): Tegumen protruding posteriorly, concave at apex. Valva large, without defined angle; cucullus clavate, densely with stout spines on lower side; sacculus narrow. Aedeagus broad basally, bearing a large, membranous ventral process at apical 1/3, with 7 cornuti.

*Female genitalia* (Fig. 30): Sterigma well sclerotized, with 2 protrusions laterally, and bearing minute spines posteriorly. Ductus bursae short, with well sclerotized sclerite. Corpus bursae very large; signa moderate in size. Ductus seminalis broad (about 2.5 times as wide as ductus bursae). Seventh sternite narrow and wide, with a pair of shallow lateral cavities.

*Materials examined*: [GW]- 1 ♂, 3 ♀, Mt. Kyebang, 26 May 1996 (YS Bae, MK Paek, and BW Lee), UIB, gen. sl. nos. UIB-131, UIB-134.

*Flight period*: Late May.

*Distribution*: Korea (GW) and Japan.

*Host plant*: Unknown.

*Remarks*: This species was originally described based on 1 female specimen collected from Japan. The male, hitherto unknown, is described and figured for the 1st time. The species is similar to *P. (P.) germmmana* and *P. (P.) shicotanaica*, but it differs from them in having the ill-defined costal strigulae and the undilated median segment of labial palpus. The species is reported for the 1st time from Korea.

***Pammene (Pammene) blanda* Bae and Park, sp. nov.**

(Figs. 8, 17, 25, 31)

*Adult*: Wing expanse: ♂ ♀ 13-14 mm (Fig. 8). Head grayish ocher; vertex mixed with dark gray. Antenna grayish fuscous, with whitish-ocher annulations. Labial palpus grayish ocher; median segment dilated; terminal segment mixed with gray, slightly exposed. Thorax and abdomen dark gray. Forewing broad; ground color dark brownish gray, with scattered yellowish-tipped scales on apical 1/3; basal and median fasciae confluent; apex black; costa with 6 pairs of yellowish strigulae from apex to basal 1/4, the apical 4 strigulae well defined, with plumbeous dots inwards, the 5th strigulae producing lustrous plumbeous streak reaching near tornus; dorsal blotch well defined, rather broad, yellowish streak reaching beyond the middle across wing; ocelloid patch ill-defined, with

plumbeous streak laterally; cilia dark gray, with a blackish subbasal line, concave below apex. Hindwing dark brownish gray, paler basally; cilia pale ocherous, with a dark gray subbasal line.

*Male scent organ* (Fig. 17): Transverse rows of scales present on 6th and 7th tergites: scales of 6th tergite long, about 3 times as long as those of 7th tergite, filiform; scales of 7th tergite spatulate.

*Male genitalia* (Fig. 25): Tegumen protruding posteriorly. Valva long, broad dorsally, widely concave at middle of lower margin, with rounded angle; cucullus clavate, with densely distributed stout spines at lower margin; sacculus sclerotized, with a dense cluster of spines on middle portion. Aedeagus long and cylindrical, pointed apically, ventral prominence ill-defined, with 25 short cornuti.

*Female genitalia* (Fig. 31): Sterigma subquadrate, well sclerotized, with 2 protrusions laterally. Ostium bursae small. Ductus bursae short, with well sclerotized sclerites. Ductus seminalis broad, about 2.5 times as wide as ductus bursae. Corpus bursae large; signa large. Seventh sternite well sclerotized, without lateral cavity.

*Materials examined*: Holotype. KOREA: ♂, [GG] Mt. Kyebang, 26 May 1996 (YS Bae, MK Paek, and BW Lee), UIB, gen. sl. no. UIB-138. Paratypes. KOREA: 1 ♀, same locality and data as holotype; 1 ♀, [GG] Gyulamri, Jungseon, Gangwon Province, 5 June 1996 (HK Lee), CIS, gen. sl. no. UIB-109.

*Flight period*: May to June.

*Distribution*: Korea (GW).

*Host plant*: Unknown.

*Remarks*: This species is superficially similar to *P. spiniana* (Duponchel) which ranges from Russia to Europe, but it is easily separated from the latter by having the rather straight aedeagus, the concave valva, and the much narrower sterigma of genitalia than that of *spiniana*. The specific name is derived from Latin "blandus" meaning elegant.

***Pammene (Pammene) shicotanica* Kuznetsov**  
(Figs. 9, 32)

*Pammene shicotanica* Kuznetsov: Danilevsky and Kuznetsov, 1968: 422, fig. 300, (Type locality: Shikotan, Kuril Is., Russia); Suzuki and Komai, 1984: 110, fig. 5; Komai, 1991: 9, fig. 34.

*Adult*: Wing expanse: ♀ 13.5 mm (Fig. 9). Head ocherous gray; vertex mixed with dark gray. Antenna grayish fuscous, with whitish annulations; scape creamy white at ventral side. Labial palpus whitish ocher; 2nd segment dilated; terminal segment scattered with gray and slightly exposed.



Thorax and abdomen fuscous gray. Forewing broad; ground color fuscous brown, darker dorsally; costa with 7 pairs of yellowish-white strigulae from apex to basal 1/4, interspaces producing bluish-plumbeous streaks; dorsal blotch absent; ocelloid patch area containing 4 black dashes; cilia ochreous gray, with a blackish subbasal line. Hindwing dark brownish gray; cilia pale ochreous, with a dark gray subbasal line.

**Female genitalia** (Fig. 32): Papillae anales long and narrow. Sterigma simple, with 2 protrusions laterally. Ductus bursae rather long, with well sclerotized sclerite. Ductus seminalis broad, about 3 times as wide as ductus bursae. Corpus bursae large; signa moderate in size. Seventh sternite slightly concave laterally, with numerous minute spines.

**Material examined:** [GW]- 1 ♀, Mt. Taebaek, 27-30 June 1996 (YS Bae, MK Paek, BW Lee, and NH Ahn), UIB, gen. sl. no. 130.

**Flight period:** Late June.

**Distribution:** Korea (GW), Japan and Russia.

**Host plants:** Unknown in Korea. *Picea glehnii* Mast. and *Pi. abies* (L.) Karst. (Pinaceae) in Japan (Suzuki and Komai 1984).

**Remarks:** This species is similar to the preceding 2 species, *P. (P.) germmana* and *P. (P.) adusta*, in superficial appearance, but differs from them by the broad forewing. The species is reported for the 1st time from Korea.

***Pammene (Pammene) soyoensis* Bae and Park, sp. nov.**

(Figs. 11, 18, 26)

**Adult:** Wing expanse: ♂ 13 mm (Fig. 11). Head ochreous gray; vertex mixed with dark gray. Antenna grayish fuscous, with whitish annulations. Labial palpus ochreous; 2nd segment not dilated; terminal segment slightly exposed. Thorax and abdomen blackish gray. Forewing broad; ground color blackish gray, darker dorsally, with a bluish-plumbeous dot at inside of mid-termen; costa with 2 pairs of distinct yellowish-white strigulae near apex, interspaces producing 3 bluish-plumbeous streaks; dorsal blotch and ocelloid patch absent; cilia dark gray, with a blackish subbasal line interrupted by yellowish spot below apex. Hindwing pointed in apex, dark brownish gray; cilia pale gray, with a dark gray subbasal line.

**Male scent organ** (Fig. 18): Abdominal scent scales absent. Hindwing with a pale yellowish-white androconial fold on dorsal margin.

**Male genitalia** (Fig. 26): Tegumen slightly pro-

truding posteriorly. Valva long, broad dorsally, widely concave at middle of lower margin, with rounded angle; cucullus spatulate, densely with stout spines along lower margin; sacculus sclerotized, sparsely with long spines. Aedeagus moderate in size, tapering in apical 1/2, ventral prominence ill-defined, with 4 medium cornuti.

**Material examined:** Holotype: KOREA: ♂, [GG] Mt. Soyo, 7 June 1996 (YS Bae, MK Paek, BW Lee, and NH Ahn), UIB, gen. sl. no. UIB-128.

**Flight period:** Early June.

**Distribution:** Korea (GG).

**Host plant:** Unknown.

**Remarks:** The male genitalia of this species are similar to those of *P. luedersiana* Sorhagen, but differ from the latter by having a long valva, pointed aedeagus and 4 cornuti. Superficially, the new species can be easily separated from the other known species of the genus in that the hindwing has a pale ochreous-white androconial fold on a dorsal margin. The specific name is derived from the name of "Mt. Soyo".

***Pammene (Pammene) sp.***

(Figs. 10, 19, 27, 33)

*Pammene japonica* sensu Park (nec Kuznetsov), 1983: 671-672, 966, fig. 243, pl. 43, fig. 753.

**Adult:** Wing expanse: ♂ 8 mm, ♀ 10 mm (Fig. 10). Head grayish ochreous; vertex mixed with dark gray. Antenna grayish fuscous, with whitish ochreous annulations. Labial palpus pale ochreous; median segment dilated; terminal segment slightly exposed. Thorax and abdomen dark gray. Forewing ground color dark gray, bearing plumbeous dots and streaks marginally; apex black; costa with 7 pairs of yellowish-white strigulae from apex to basal 1/4, interspaces producing long and short bluish-plumbeous streaks; dorsal blotch rather narrow, yellowish-white streak reaching beyond middle across wing; ocelloid patch same as ground color, edged with plumbeous streaks laterally; cilia ochreous gray, with a blackish subbasal line. Hindwing light fuscous; cilia pale ochreous, with a dark gray subbasal line.

**Male scent organ** (Fig. 19): Transverse rows of abdominal scent scales absent.

**Male genitalia** (Fig. 27): Tegumen short. Valva short, deeply concave at middle of lower margin, with large, subquadrate basal cavity; cucullus spatulate, with dense stout spines along lower edge; sacculus with well defined, protruding angle. Aedeagus long, straight, and cylindrical, narrow apically; cornuti missing.

*Female genitalia* (Fig. 33): Sterigma membranous. Ostium bursae wide and simple. Ductus bursae moderate in size, well sclerotized, broader posteriorly. Ductus seminalis broad, about 2.5 times as wide as ductus bursae. Corpus bursae large, with small signa. Seventh sternite slightly concave laterally, with numerous spines.

*Materials examined*: [GW]- 1 ♀, Campus of Kangwon Nat. Univ, Chunchon, 3 June 1992 (KT Park), CIS, gen. sl. no. UIB-147. [GG]- 1 ♂, Gwangleung, 8 June 1977 (RK Choe), CIS, gen. sl. no. 1101.

*Flight period*: Early June.

*Distribution*: Korea (GW, GG).

*Host plant*: Unknown.

*Remarks*: The Korean specimens of this species were erroneously identified to *P. japonica* Kuznetsov by the 2nd author (1983), but these specimens are of a quite different species. This species is closely allied and similar to having the Japanese species, *P. flavicellula* Kuznetsov, but can be distinguished from the latter by the smaller and narrower forewing, the median dorsal blotch (premedian in *flavicellula*), the narrower sterigma, and the smaller corpus bursae. This species was described in a doctoral thesis of the University of Osaka Prefecture, Japan by Komai (1982), and he will publish it soon.

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## 韓國產超小捲葉蛾屬及描述二新種

裴良燮<sup>1</sup> 朴奎澤<sup>2</sup>

本文描述韓國產之九種 *Pammene* (超小捲葉蛾)，其中兩種：*P. (P.) blanda* 及 *P. (P.) soyoensis* 為新種；五種：*P. (P.) ignorata*, *P. (P.) germmana*, *P. (P.) adusta*, *P. (P.) shicotanica* 及 *P. (P.) sp.* 為新記錄種。根據雄性的外生殖器建立這些種類的檢索表。除了描述成蟲、雄蟲腹部的臭腺、及雌、雄的外生殖器之外，文中並附上其寄主植物作為參考。

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