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Faunistic data of micromoths (Lepidoptera) in North Korea

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ABSTRACT

In a study of material of microlepidoptera in North Korea that was collected during the zoological expeditions (1970s–1980s) conducted under a scientific agreement between Polish and North Korean academies of science, 17 species belonging to the superfamily Gelechioidea are recognized. Of the total, 11 species of Gelechiidae, two species of Oecophoridae, and two species of Coleophoridae are newly reported from North Korea. *Scrobipalpa atriplicella* (Fisher von Röslerstamm, 1841) of Gelechiidae is reported for the first time from the Korean Peninsula. Images of adults and genitalia of all species are given.

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Introduction

Microlepidoptera including Gelechiidae, Oecophoridae, and Coleophoridae in North Korea have been poorly known. Park and Razowski (1991) included 16 species of Tortricini from North Korea in a review of the Tortricini (Tortricidae) in the Korean Peninsula, based on material collected from North Korea and preserved at the Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Cracow, Poland. In the same year, Park and Byun (1991) reported 26 species of Tortricidae from North Korea, based on specimens collected from North Korea and deposited in the Hungarian Natural History Museum (HNHM), Budapest, Hungary. Sinev and Park (1994) reported *Stathmopoda stimolata* Meyrick of the family Stathmopodidae, collected from Mt. Keumkang-san, and *Batrachedra koreana* Sinev & Park of the family Batrachedridae, collected from Mt. Pektu-san, North Korea. Park et al (2001) published “Moths of North Korea,” but no micromoth was included in the book.

For the North Korean fauna of Gelechiidae, only 4 species—*Helcystogramma triannulella* (Herrich-Schäffer), *Dichomeris heriguronis* (Matsumura), *Dichomeris oceanis* (Meyrick), and *Pectinophora gossypiella* (Saunders)—were known, until Park (1991)

reported 19 species of the family including two *Autosticha* species, with descriptions of *Aroga gozmanyi* Park and *Dendrophila mediofasciana* Park, based on material deposited at the HNHM. Jaros et al (1992) reported 2 species of Gelechiidae, *Chinodes viduella* (Fabricius) and *Prolita sexpunctella* (Fabricius), collected from Mt. Pektu-san. Park and Ponomarenko (2007) cited 25 species of Gelechiidae from North Korea, based on previous reports and some additional specimens, in the comprehensive monograph of the family in the Korean Peninsula. Recently, Lee and Byun (2015) reported *Helcystogramma triannulella* (Herrich-Schäffer) from North Korea, but it was previously reported. As a non-gelechiid moth, *Scythropiodes issikii* (Takahashi, 1930) belonging to Oditinae, was reported by Park and Wu (1997).

In this paper, 17 species belonging to the superfamily Gelechioidea are recognized. Among them, 11 species of Gelechiidae, two species of Oecophoridae, and two species of Coleophoridae are newly reported from North Korea. *Scrobipalpa atriplicella* (Fisher von Röslerstamm, 1841) of Gelechiidae is reported for the first time from the Korean Peninsula. Consequently, a total of 41 species of Gelechiidae, two species of Oecophoridae, two species of Coleophoridae, two species of Autostichidae, and a species of Oditinae were investigated. The subfamily Oditinae was previously placed in Lecithoceridae, but it is not associated with the family (Park, 2015).

Materials and methods

The material examined for this study was based on a small series of collections gathered from North Korea and preserved at the

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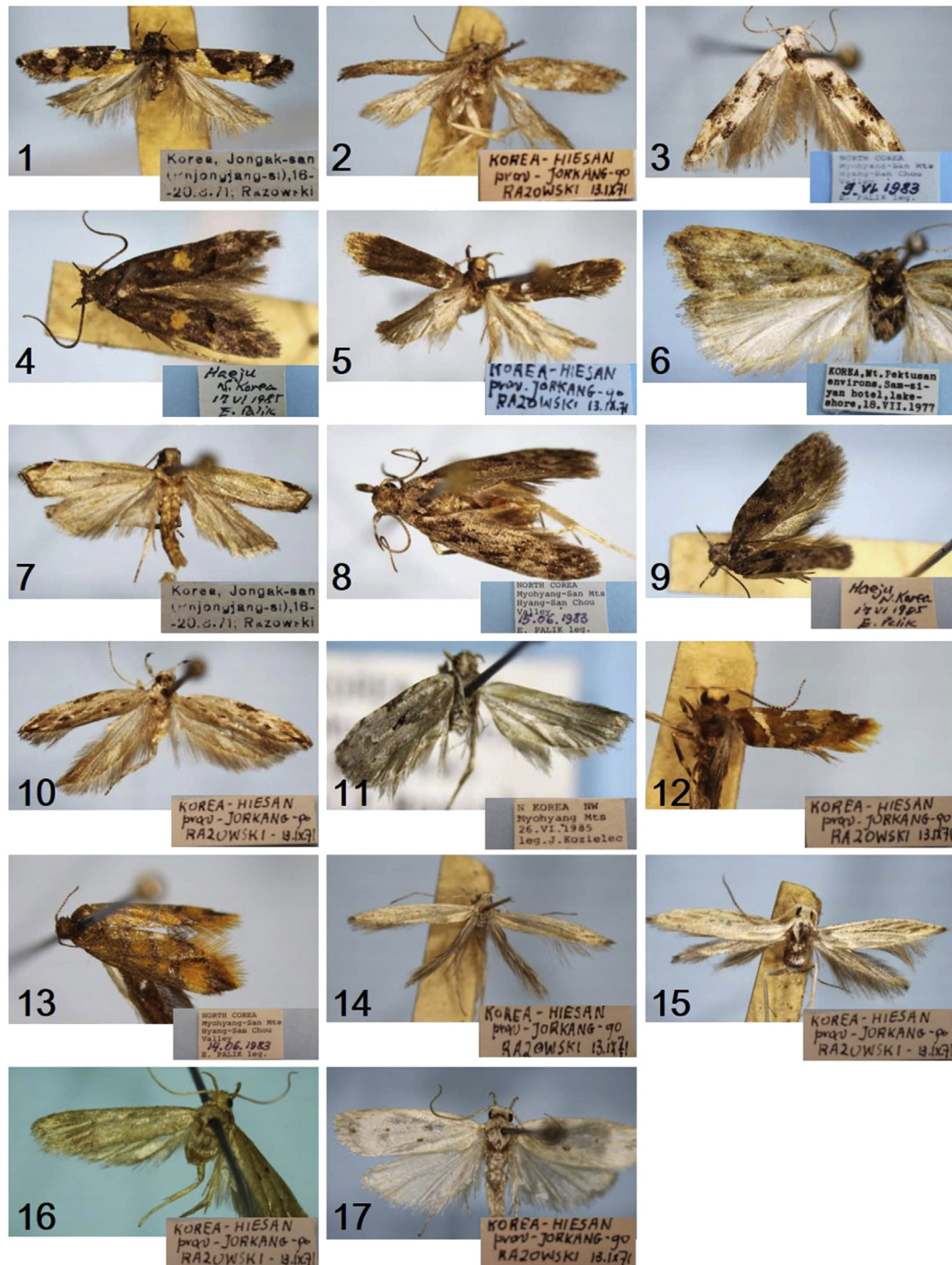
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Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Cracow, Poland. The material was collected by J. Razowski, who was a well-known specialist of Tortricidae, and E. Palik, during a series of zoological expeditions in North Korea (1970s–1980s) under a scientific agreement between the science academies of both countries. For all identified species, the general specific information, including references for the original

descriptions, type locality (TL), material examined, and the distributions of the species are given. Images for adults with their labels and genitalia are provided. The regional parts of South Korea are as follows—(1) Central part: Gyeonggi province, Gangwon Province, Chungbuk Province, Chungnam Province, and Gyungbuk Province; and (2) South part: Jeonnam Province, Gyeongnam Province, and Jeju Province.



Figures 1–17. Adults. 1, *Stegasta jejuensis* Park & Omelko; 2, *Scrobipalpa atriplicella* (Fisher von Röslerstamm); 3, *Parastenolechia argobathra* (Meyrick); 4, *Carpatolechia yangyangensis* (Park); 5, *Pexicopia melitoligna* (Meyrick); 6, *Dichomeris litoxyla* Meyrick; 7, *Dichomeris rasilella* (Herrich-Shäffer); 8, *Faristenia quercivora* Ponomarenko; 9, *Faristenia ussuriella* Ponomarenko; 10, *Hypatima excellentella* Ponomarenko; 11, *Anarsia bipinnata* (Meyrick); 12, *Promolactis suzukiella* (Matsumura); 13, *Promolactis atriplagata* Park & Park; 14, *Coleophora* sp.; 15, *Coleophora versurella* Zeller; 16, *Autostich modicella* (Meyrick); 17, *Scythropiodes issikii* (Takahashi).

Taxonomic accounts

Family Gelechiidae

1. *Stegasta jejuensis* Park & Omelko, 1994

(Figures 1, 18, and 18A)

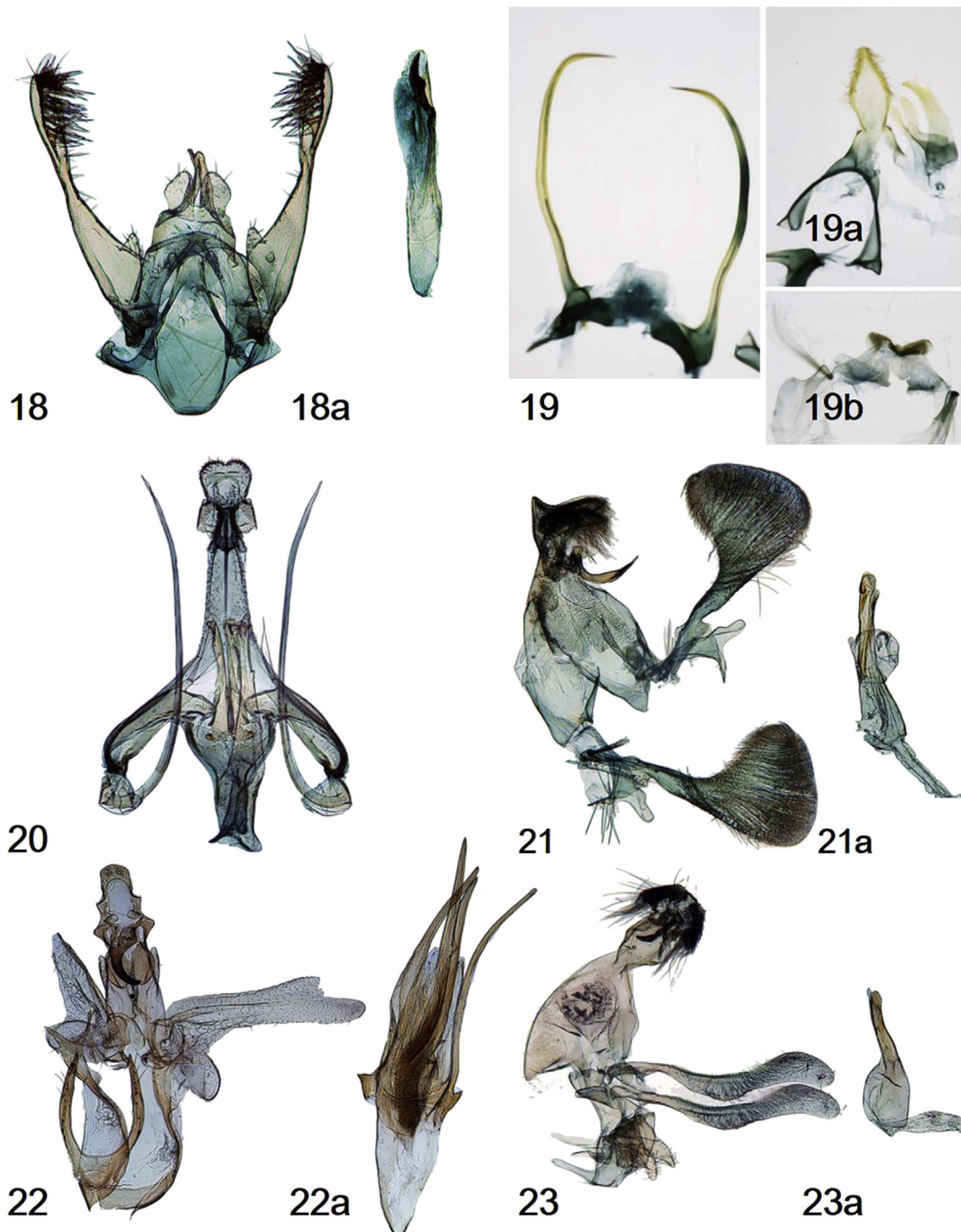
Stegasta jejuensis Park & Omelko, 1994: 870; Park & Ponomarenko, 2007: 35. TL: Jeju, Korea.

Diagnosis. Wingspan, 9–10 mm. The species is superficially similar to *Stegasta abdita* Park & Omelko, but it can be distinguished by the male genitalia having a larger spine on the costal margin of the valva.

Male genitalia (Figures 18 and 18A). See also Park and Omelko (1994) and Park and Ponomarenko (2007).

Material examined. 1♂, Seokam, Sunan, North Korea, 21 viii 1971 (J. Razowski), gen. slide no. CIS-6581.

Remarks. The species was described from Jeju Island, Korea, and also known in Japan.

2. *Scrobipalpa atriplicella* (Fisher von Röslerstamm, 1841) (Figures 2 and 28)*Tinea atriplicella* Fisher von Röslerstamm, 1841: 78.*Scrobipalpa atriplicella*; Park & Ponomarenko, 2007: 71.

Figures 18–23. Male genitalia (a, aedeagus; b, abdominal segment VIII). 18, *Stegasta jejuensis* Park & Omelko; 19, *Carpatolechia yangyangensis* (Park); 20, *Parastenolecthia argobathra* (Meyrick); 21, *Pexicopia melitoligna* (Meyrick); 22, *Dichomeris litoxyla* Meyrick; 23, *Faristenia quercivora* Ponomarenko.

Diagnosis. Wingspan 12–13 mm. The species of the genus is not easy to distinguish from congeners by superficial characters, and male genitalia are needed for identification.

Female genitalia (Figure 28). See Park and Ponomarenko (2007).

Material examined. 1♀, Hyesan (originally spelled as “Hiesan”), Jagang Province, North Korea, 13 ix 1971 (J. Razowski), gen. slide no. CIS-6583.

Remarks. The species is trans-Palaearctic, and is distributed in Europe, Russia, China, Japan, and North America. Park and Ponomarenko (2007) reported this species from Mt. Changbaisan, North China, but it has not been observed in the Korean Peninsula.

3. *Carpatolechia yangyangensis* (Park, 1992)

(Figures 4, 19, 19A, and 19B)

Teleiodes yangyangensis Park, 1992, Ins. Koreana, 9: 8. TL: Yangyang, Korea.

Carpatolechia yangyangensis; Park, 2004: 56; Park & Ponomarenko, 2007: 114.

Diagnosis. Wingspan 12–15 mm. The male genitalia are characterized by the diamond-shaped uncus and the thin, long glanducts exceeding the apex of uncus.

Male genitalia (Figures 19, 19A, and 19B). See also Park (1992, 2004) and Park and Ponomarenko (2007).

Material examined. 1♂, Haeju, 17 vi 1985 (E. Palik), gen. slide no. CIS-6578.

Remarks. The species is one of the common species in Korea, and it is also known in Japan.

4. *Parastenolechia argobathra* (Meyrick, 1935)

(Figures 3 and 20)

Telphusa argobathra Meyrick, 1935: 66; Park, 1983: 85; Park, 1993: 16; Park 1998: 299, 2004: 46; Park & Ponomarenko, 2007: 85. TL: Tien-Mu-san, China.

Diagnosis. Wingspan 14–15 mm. The species is superficially very similar to *Parastenolechia albicapitella* Park, but it can be distinguished by the male genitalia.

Male genitalia (Figure 20). See also Kanazawa (1985), Park (1993, 1998), Park and Ponomarenko (2007).

Material examined. 1♀, Mt. Myohyang-san, Hyangsan Chou Valley, North Korea, 9 vi 1983 (E. Palik), gen. slide no. CIS-6591.

Remarks. The species is distributed in the Russian Far East, China, and Japan. In Korea, it has been observed in the Central part.

5. *Pexicopia melitolicna* (Meyrick, 1935)

(Figures 5 and 21)

Gelechia melitolicna Meyrick, 1935: 67; Park & Ponomarenko, 2006: 278; 2007: 51. TL: Nanking, China.

Diagnosis. Wingspan 13–14 mm. The species is similar to the European species, *Pexicopia malvella* (Hübner), but can be distinguished by its smaller size with grayish brown forewing, and the shorter dilated distal part of cucullus in the male genitalia.

Male genitalia (Figure 21). See also Clarke (1969), Li (2002), and Park and Ponomarenko (2007).

Material examined. 2♂, Hyesan Jagang-do, 13 ix 1971 (Razowski), gen. slide no. CIS-6549.

Remarks. The species has been known in the Central part of Korea.

6. *Dichomeris litoxylla* Meyrick, 1937

(Figures 6, 22, and 22A)

Dichomeris litoxylla Meyrick, 1937: 123; Park, 1994: 12; Park & Ponomarenko, 2007: 149. TL: Primorye, Russia.

Diagnosis. Wingspan, 21–25 mm. The forewing pattern is similar to that of the European species, *Dichomeris deracella* (Denis & Schiffermüller), but it can be distinguished by the male genitalia with longer aedeagus.

Male genitalia (Figures 22 and 22A). See also Clarke (1969), Park (1994), Ponomarenko (1999), and Park and Ponomarenko (2007).

Material examined. 1♂, Mt. Pektu-san, Samziyeon Hotel lake, North Korea, 18 vii 1977, no. 373, light trap (Dely & Draskovits), gen. slide no. CIS-4721.

Remarks. The species has been reported in the South and Central parts in Korea. It is also found in China and the Russian Far East.

7. *Dichomeris rasilella* (Herrich-Shäffer, 1854)

(Figures 7, 24, 24A, 25, and 25A)

Anacamptis rasilella Herrich-Shäffer, 1854: 191.

Dichomeris rasilella; Park, 1994: 16; Park & Hodges, 1995: 52, Park, 2004: 94; Park & Ponomarenko, 2007: 153.

Diagnosis. Wingspan, 12–13 mm. The species is superficially similar to *Dichomeris autometra* Meyrick, which was described from Taiwan, but differs from the latter by the absence of distinct oblique short streaks on the costal margin before 2/3, smaller median discal spot, and no distinct spot below discal spot in fold. The male genitalia are also similar, but can be distinguished via the smaller digitate, juxtal lobes in the male genitalia.

Male genitalia (Figures 24, 24A, 25, and 25A). A difference in the shape of the juxtal lobes in the male genitalia is found between the two specimens from North Korea. However, it is considered that the difference is attributable to an individual variation. In the comparison of specimens collected from various localities in the Korean Peninsula from North to South, including Jeju Island, some differences are recognized.

Material examined. 1♂, Mt. Ryongak-san, North Korea, 16-20 viii 1971 (J. Razowski), gen. slide no. CIS-6553; 1♂, Mt. Myohyang-san, Hyangsan Chou Valley, North Korea, 17 vi 1983 (E. Palik), gen. slide no. CIS-6552.

Remarks. The species is one of the common species in Korea, occurring throughout the Korean peninsula. It is distributed in Europe including the European part of Russia to Central Asia, Japan, and Taiwan.

8. *Faristenia quercivora* Ponomarenko, 1991

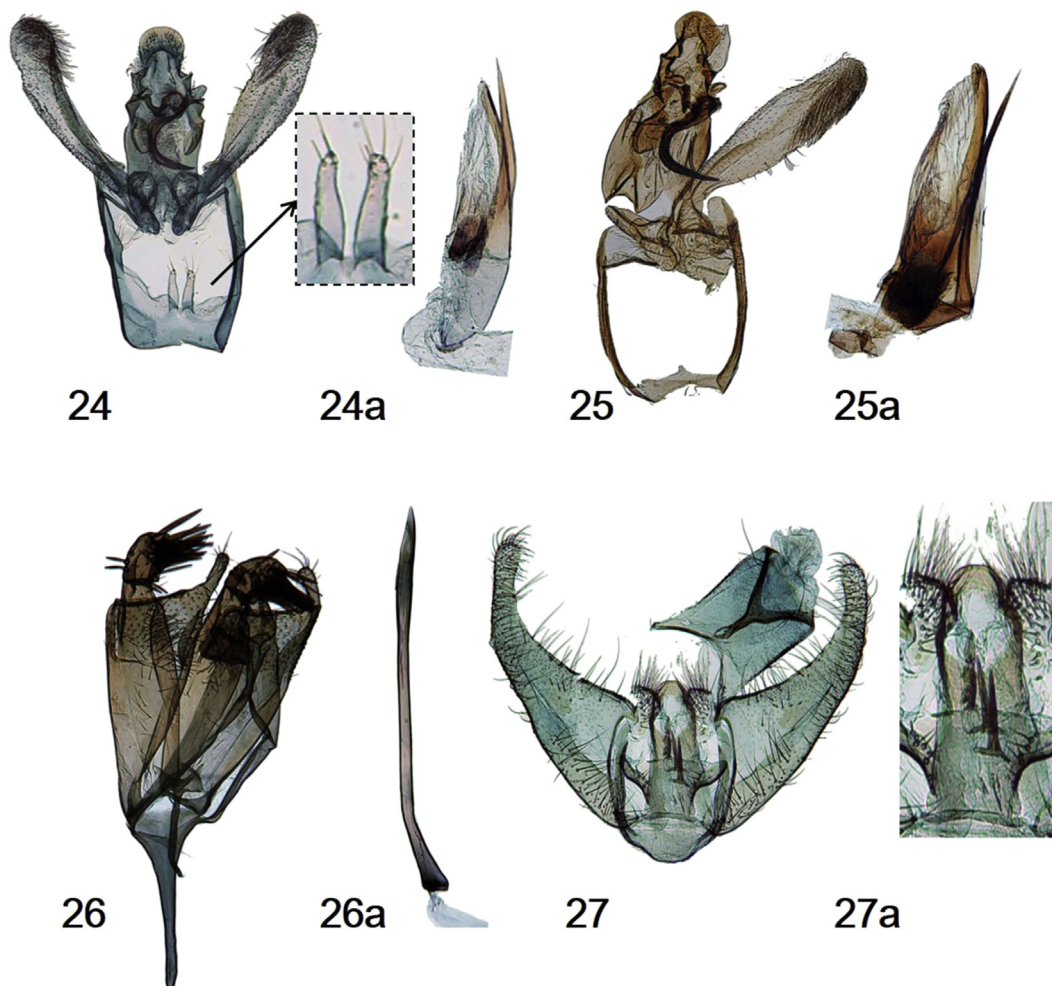
(Figures 8, 23, and 23A)

Faristenia quercivora Ponomarenko, 1991: 34 Park & Byun, 1995: 138; Park & Ponomarenko, 2007: 173. TL: Primorsk Territory, Russia.

Diagnosis. Wingspan, 15–17 mm. The species can be distinguished from its allies by the S-shaped valve in the male genitalia.

Material examined. 2♂, Mt. Myohyang-san, Hyangsan Chou Valley, North Korea, 7 vi 1983 & 15 vi 1983 (E. Palik), gen. slide no. CIS-6551, -6594.

Male genitalia (Figures 24 and 24A). See also Ponomarenko (1991, 1991, 1999), Park (1993), Li (2002), and Park and Ponomarenko (2007).



Figures 24–27. Male genitalia (a, aedeagus). 24, *Dichomeris rasilella* (Herrich-Shäffer), gen. slide no. CIS-6553, Mt. Ryongak-san; 25, ditto, gen. slide no. CIS-6553, Mt. Myohyang-san; 26, *Promalactis atriplagata* Park & Park; 27, *Scythropiodes issikii* (Takahashi).

Remarks. The species is one of the common species in Korea and has been found in the Central part. It is also known in the Russian Far East, China, and Japan.

9. *Faristenia ussuriella* Ponomarenko, 1991
(Figures 9 and 29)

Faristenia ussuriella Ponomarenko, 1991: 615. Park, 1993: 35; Park & Byun, 1995: 138; Park & Ponomarenko, 2007: 173. TL: Primorsk Territory, Russia.

Diagnosis. Wingspan, 14–15 mm. The male genitalia are closely similar to those of *Faristenia omelkoi* Ponomarenko, but can be distinguished by the more slender valve with narrower cucullus.

Female genitalia (Figure 28). See also Ponomarenko (1991), Park (1993), Li (2002), and Park and Ponomarenko (2007).

Material examined. 2♀, Haeju, North Korea, 17 vi 1985 (E. Palik), gen. slide no. CIS-6553, -6556.

Remarks. The female genitalia are similar to those of *Faristenia ussuriella* Ponomarenko, but differ from the latter by the coiled ductus bursae.

10. *Hypatima excellentella* Ponomarenko, 1991
(Figures 10 and 30)

Hypatima excellentella Ponomarenko, 1991: 617; Park, 1993: 28; Ueda et al, 1995: 149; Ponomarenko, 1997: 38; Park & Ponomarenko, 2007: 164. TL: Primorsk Territory, Russia.

Diagnosis. Wingspan, 13–14 mm. The species is similar to *Hypatima silvestris* Meyrick, which was described from North India, but it can be distinguished by the male genitalia.

Female genitalia (Figure 29). See also Park (1993), Ueda et al (1995), Ponomarenko (1997), Li (2002), and Park and Ponomarenko (2007).

Material examined. 1♀, Hyesan Jagang-do, 13 ix 1971 (J. Razowski), gen. slide no. CIS-6582.

Remarks. The species is found throughout the central and southern parts of South Korea, including Jeju Island, but is reported for the first time in North Korea.

11. *Anarsia bipinnata* (Meyrick, 1932)
(Figure 11)

Chelaria bipinnata Meyrick, 1932: 200. TL: Gifu, Japan.

Anarsia bipinnata; Park, 1991: 492; Park & Byun, 1995: 138; Park & Ponomarenko, 2007: 180.

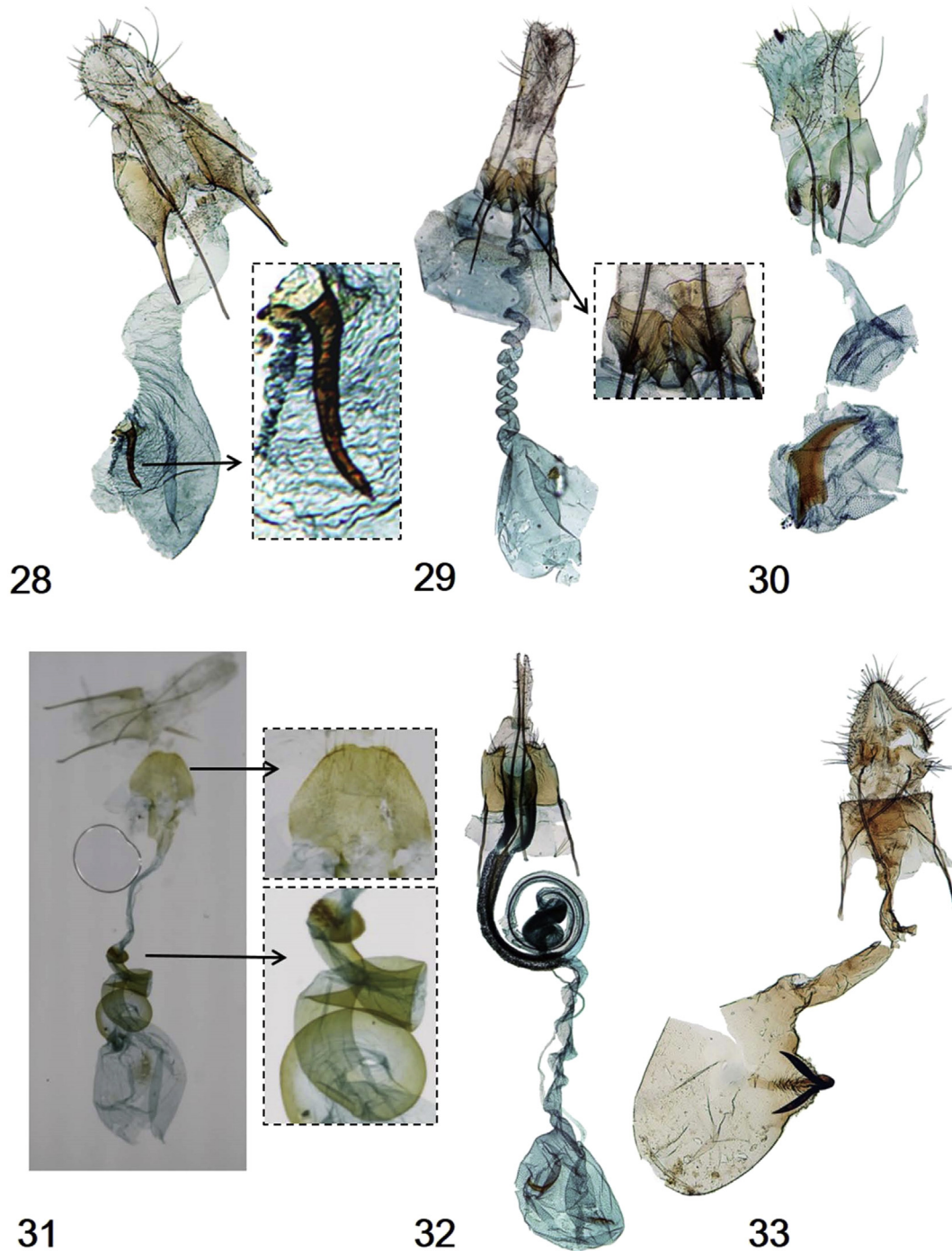
Ananarsia bipinnata; Ponomarenko, 1997: 51; 1999: 255.

Diagnosis. Wingspan, 15–17 mm.

Male genitalia. See also Park (1991), Ueda (1997), Ponomarenko (1999), Li (2002), and Park and Ponomarenko (2007).

Material examined. 1♂ (abdomen missing), Mt. Myohyang-san, 26 vi 1985 (J. Kozielec).

Remark. The species is one of the common species in Korea. It is also found in China, Russian Far East, and Japan.



Figures 28–33. Female genitalia. 28, *Scrobipalpa atriplicella* (Fisher von Röslerstamm); 29, *Faristenia quercivora* Ponomarenko; 30, *Faristenia ussuriella* Ponomarenko; 31, *Promalactis suzukiella* (Matsumura); 32, *Coleophora versurella* Zeller; 33, *Autostich modicella* (Meyrick).

Family Oecophoridae

1. *Promalactis suzukiella* (Matsumura, 1931)

(Figures 12, 26, and 26A)

Borkausenia suzukiella Matsumura, 1931, *Insecta Mats.*: 1089. TL: Honshu, Japan.

Promalactis suzukiella; Park, 1981: 14; Park & Park, 1998: 57.

Diagnosis. Wingspan, 12–2.5 mm. The species can be distinguished from its allies by the large, ovate, white costal marking,

subbasal line not reaching to dorsum, median line broad, and fuscous fascia near tornus connected to costal marking.

Male genitalia (Figures 26 and 26A). See also Park and Park (1998).

Material examined. 1♂, Hyesan, Jagang Province, North Korea, 13 ix 1971 (J. Razowski), gen. slide no. CIS-6592.

Remarks. The species is common in Korea, and it is also distributed in Japan, China, Russia, Vietnam, and the United States.

2. *Promalactis atriplagata* Park & Park, 1998

(Figures 13 and 31)

Promalactis atriplagata Park & Park, 1998: 60. TL: Mt. Seolak-san, Korea.

Diagnosis. Wingspan, 12–13 mm. This species is characterized by the distinct fuscous apical marking of the forewing, the large fan-shaped lamella postvaginalis medially emarginated.

Female genitalia (Figures 31). See also Park and Park (1998).

Material examined. 1♀, Mt. Myohyang-san, Hyangsan Chou Valley, 14 vi 1983 (E. Palik), gen. slide no. CIS-6580.

Remarks. The species is endemic to Korea so far. It is known in the South and Central parts of the Korean Peninsula.

Family Coleophoridae

1. *Coleophora* sp.

(Figure 14)

Diagnosis. Wingspan, 12–13 mm.

Material examined. 1 (abdomen missing), Haesan, Jagang Province, North Korea, 13 ix 1971 (Razowski).

Remarks. The specimen is missing its abdomen and this is not confirmed in the species, but it looks like *Coleophora sternipennella* (Zetterstedt, 1839), according to the wing pattern and markings.

2. *Coleophora versurella* Zeller, 1849

(Figures 15 and 32)

Coleophora versurella Zeller, 1849: 353; Park & Baldizone, 1992: 521; Kim & Park, 2009: 196; Park & Kim, 2015: 60.

Diagnosis. Wingspan, 12–13 mm. The species can be distinguished from congeners by the ductus bursae with dense minute spines in the distal half in the female genitalia.

Female genitalia (Figure 32). See also Park and Baldizone (1992), Kim and Park (2009), and Park and Kim (2015).

Material examined. 1♂, Hyesan, Jagang Province, North Korea, 13 ix 1971 (Razowski), gen. slide no. CIS-6584.

Remarks. It is one of the common species in Korea. It is known that larvae feed on *Amarenthus* sp., *Atriplex* sp., and *Chenopidium* sp. (Razowski 1990).

Family Autostichiidae

1. *Autosticha modicella* (Christoph, 1882)

(Figure 16 and 33)

Brachmia modicella Christoph, 1882. Bull. Soc. imp. Nat. Moscou, 57: 28. TL: E Siberia.

Autosticha modicella; Park & Wu, 1991: 202.

Material examined. 1♀, Hyesan, Jagang Province, North Korea, 13 ix 1971 (Razowski), gen. slide no. CIS-6558.

Female genitalia (Figure 33). See also Park and Wu (1991).

Remarks. The species was reported from North Korea by Park (1991), collected in Mt. Pektu-san, Mt. Keumkang-san, and Mt. Myohyang-san, North Korea. The species is also known in China as well as Taiwan, Russia (E Siberia, Ussuri), and Japan.

Subfamily Oditinae

1. *Scythriodes issikii* (Takahashi, 1930)

(Figure 17, 27, and 27A)

Depressaria issikii Takahashi, 1930. Kaju Gaityu Kakuron, 1: 285. TL: Japan.

Scythriodes issikii; Park & Wu, 7: 42.

Material examined. 1♂, Hyesan, Jagang Province, North Korea, 13 ix 1971 (Razowski), gen. slide no. CIS-6593.

Remarks. The species was reported from North Korea by Park and Wu (1997), based on a male specimen collected from Mt. Myohyang-san, North Korea, and preserved at the HNHM in Budapest. This species is widely spread in the Korean peninsula.

Checklist of the known species of Gelechioidea from North Korea (marked with asterisks): Newly reported species from North Korea)

Family Gelechiidae

Metzneria inflamatella Christoph, 1882 Mt. Pektu-san, Sam-ji-yeon

Polyhymno pontifera (Meyrick, 1935) Mt. Keumkang-san

Polyhymno synodonta (Meyrick, 1936) Mt. Myohyang-san

Gelechia anomorcha Meyrick, 1926 Mt. Pektu-san, Sam-ji-yeon

*Pexicopia melitolicna** (Meyrick, 1935) Hyesan

Evippe albidorsella (Snellen, 1884) Mt. Keumkang-san

Evippe syrichtis (Meyrick, 1936) Pyeongyang

*Stegasta jejuensis** Park & Omelko, 1994 Seokam, Jagang Province

*Scrobipalpa atriplicella** (Fisher von Röslerstamm, 1841) Hyesan

*Parastenolechia argobathra** (Meyrick, 1935) Mt. Myohyang-san

Aroga mesostrota (Meyrick, 1932) Mt. Ryongak-san

Aroga gozmanyi Park, 1991 Mt. Keumkang-san

Aroga mesostrepta (Meyrick, 1932) Mt. Ryongak-san

Chinodes mongolica Piskunov, 1979 Mt. Pektu-san, Sam-ji-yeon

Chinodes viduella (Fabricius, 1794) Mt. Pektu-san, Mt. Keumkang-san

Chorivalva unisaccula Omelko, 1988 Mt. Keumkang-san

Carpatolechia digitilobella (Park, 1992) Mt. Keumkang-san

Carpatolechia flavipunctatella (Park, 1992) Mt. Keumkang-san

Carpatolechia fugitivella (Zeller, 1839) Mt. Keumkang-san

*Carpatolechia yangyangensis** Park, 1992 Haeju

Teleiodes cryptocostella Park, 1992 Mt. Keumkang-san

Telphusa comprobata Meyrick, 1935 Mt. Myohyang-san

Syncopacna anthylidella (Hubner, 1831) Sariwon, Pyeongyang

Anacamptis solemnella (Christoph, 1882) Mt. Pektu-san, Sam-ji-yeon

Prolita sexpunctella (Fabricius, 1794) Mt. Pektu-san, Sam-ji-yeon

Dendrophilia mediofasciana Park, 1991 Kaesung, Mt. Myohyang-san

*Faristenia quercivora** Poomarenko, 1991 Mt. Myohyang-san

*Farestenia ussuriella** Ponomarenko, 1991 Haeju

Anarsia lineatella (Zeller, 1839) Duman Riverside

*Anarsia bipinnata** (Meyrick, 1932) Mt. Myohyang-san

Hypatima venefica Ponomarenko, 1991 Mt. Pektu-san, Sam-ji-yeon

*Hypatima excellentella** Ponomarenko, 1991 Hyesan

Helcystogramma triannulella (Herrich-Schäffer, 1854) Sariwon

Dichomeris derasella (Den. Et Schiff., 1775) Mt. Keumkang-san

Dichomeris harmonias Meyrick, 1922 Mt. Keumkang-san

Dichomeris heriguronis (Matsumura, 1931) Mt. Myohyang-san

Dichomeris issikii (Okada, 1961) Mt. Keumkang-san

*Dichomeris litoxyla** Meyrick, 1937 Mt. Pektu-san, Sam-ji-yeon

Dichomeris rasilella (Herrich-Schäffer, 1854) Mt. Ryongak-san, Mt. Myohyang-san

Dichomeris ustatella (Fabricius, 1795) Mt. Keumkang-san

Family Oecophoridae

*Promalactis suzukiella** (Matsumura, 1931) Hyesan

*Promalactis atriplagata** Park & Park, 1998 Mt. Myohyang-san

Family Coleophoridae

*Coleophora** sp. Hyesan

*Coleophora versurella** Zeller, 1849 Hyesan

Family Autostichidae

Autosticha modicella (Christoph, 1882) Mt. Pektu-san, Mt. Keumkang-san, Mt. Myohyang-san

Autosticha rufescens (Haworth, 1829) Mt. Pektu-san, Sam-ji-yeon

Subfamily Oditinae

Scythropiodes issikii (Takahashi, 1930) Mt. Myohyang-san

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