

Stapfia 16

273 - 290

5. 5. 1988

NEW SPECIES OF PLANT MINING LEPIDOPTERA (NEPTICULIDAE,
TISCHERIIDAE) FROM CENTRAL ASIA

R. Puplesis, Vilnius

A b s t r a c t : The description of 10 new species of the Nepticulidae and 1 new species of the Tischeriidae from Tadzhikistan, Uzbekistan and Turkmenistan (USSR) are given. Most of the new nepticulid moths belong to the genus *Stigmella* SCHRANK and are included in the *S. malella* STT., *S. ultima* PUPL. and *S. salicis* STT. groups. Three new species are described in the genus *Ectoedemia* BUSCK.

K e y w o r d s : Plant mining Lepidoptera, Nepticulidae, Tischeriidae, *Stigmella klimeschi*, *Stigmella semiaurea*, *Stigmella bicolor*, *Stigmella acerna*, *Stigmella aiderensis*, *Stigmella kondarai*, *Stigmella juratae*, *Ectodemia ingloria*, *Ectodemia insignata*, *Ectodemia petrosa*, *Tischeria longispicula*.

Introduction

The plant mining moths from the families Nepticulidae and Tischeriidae have a wide distribution and have been studied to the greatest extent in Europe. A considerable contribution to the data on plant mining Lepidoptera of these regions has been made by KLIMESCH (1951, 1975a,b, 1977, 1978). In Central Asia, however, the fauna of the Nepticulidae and the Tischeriidae has been poorly studied. Although investigations of the fauna of the Central

Asian part of the USSR were initiated much earlier (GERASIMOV 1952, KUZNETSOV 1960) intensive studies of miners from the Nepticulidae and the Tischeriidae of these large regions have started only recently (PUPLESIS 1984, 1985, 1987 in press, FALKOVITCH 1986).

In the course of collections of Lepidoptera in the mountainous part of Turkmenistan, Uzbekistan and Tadjikistan in 1985-1986, a considerable number of new species was noted. The present paper gives descriptions of 11 new species. The scanty asiatic material of the Zoological Institute of the USSR Academy of Science (Leningrad) has also been used in this study. The types of new species are deposited in the author's collection and in the collection of the Zoological Institute of the USSR Academy of Science.

The author would like to thank Dr. P. Ivinskis (Vilnius) and especially Dr. V.I. Kuznetsov (Leningrad) for their advice as well as for making their collected material available.

I am deeply grateful to my students K. Kvietkauskas and R. Noreika for their assistance in the preparation of this paper.

Descriptions of new species

Stigmella klimeschi sp.n.

This species was named in honour of Dr. Josef Klimesch, a world-known entomologist and excellent specialist of plant miners Lepidoptera.

D i a g n o s i s : It belongs to the *S. malella* STT.-group and is closer to *S. alaternella* LE MARCHAND. The new species differs in structure of the male genitalia, primarily in forms of valves, broad anterior extension of vinculum and highly sclerotized uncus, and style.

D e s c r i p t i o n :

M a l e : Forewing length 2,2 - 2,5 mm. Head: frontal tuft yellowish orange, sometimes apically brownish. Eye-caps white creamy or creamy. Antennae usually brown on upperside and light brown on underside. Thorax and forewings dark, greyish metallic background densely speckled with black brown scales. Hindwings and cilia brownish grey.

F e m a l e : Forewing length 2,2 - 2,4 mm. Coloration like the male. Usually antennae lighter.

M a l e g e n i t a l i a : (figs. 1,2,3), Uncus medially joined by two prominent processes and several others of less importance on the caudal margin. On apical uncus very sclerotized. Gnathos bilobed. Vinculum with two large, highly sclerotized, apically broadly rounded anterior lobes. Valves apically constricted and very sclerotized, cuiller as slightly rounded and separated lobe. Aedeagus with numerous granular cornuti and 2 slightly sclerotized aculeate cornuti more on the apical part.

F e m a l e g e n i t a l i a : (fig. 15), Posterior apophyses longer than anterior apophyses. Accessory sac long poorly sclerotized, bursa copulatrix densely covered with small pectinations.

T y p e m a t e r i a l s : Holotype ♂, USSR, Tadjikistan, 30 km N Dushanbe, 8.VIII.1986, R. Puplesis. Paratypes, 9 ♂, 5 ♀, the same labels as holotype, 28.VII. - 20.VIII.1986, R. Puplesis.

Stigmella semiaurea sp.n.

D i a g n o s i s : This species belongs to the *S. ultima* PUPL.-group. It differs in goldish creamy coloration of the forewings and in structure of the male genitalia, primarily in forms of the valves. Styles of them are differentiated greatly. The apical parts of valves are densely covered with long chaetae. It differs in shorter ventral arm of transtilla and broader ventral plate of vinculum from related *S. bumbegerensis* PUPL.

D e s c r i p t i o n :

M a l e : Forewing length 1,4 - 1,6 mm. Head: frontal tuft pale orange to brownish. Eye-caps and collar creamy. Antennae greyish. Thorax, uppersides of forewings and cilia unicolor, creamy with slight golden reflections. The undersides of forewings are covered with pale brown fuscous brown scales. Hindwings are brown in both sides frequently, but cilia of hindwings remain light.

F e m a l e : Forewing length 1,5 - 1,7 mm. Coloration of head, thorax and forewings as in male. Hindwings and cilia usually light, with creamy lustre.

M a l e g e n i t a l i a : (fig. 4), Uncus slightly bilobated. Anterior lobes of vinculum narrow and tapering, but not very long. Valves with badly differentiated style and a row of long dense chaetae in apical part. Numerous cornuti small in aedeagus situated in large mass.

F e m a l e g e n i t a l i a : (fig. 16,17), Posterior apophyses longer than anterior, anterior processes of anterior apophyses are not narrow as usual but short and triangular like those in *S. orientalis* KEMP. et WILK. Bursa copulatrix with two elliptical signa, covered with spines.

T y p e m a t e r i a l : Holotype, ♂, USSR, Tadjikistan, 30 km N Dushanbe, 20.VIII.1986, R. Puplesis. Paratypes, 11 ♂, 3 ♀, the same labels as holotype, 28.VI. - 22.VIII.1986, R. Puplesis.

Stigmella bicolor sp.n.

D i a g n o s i s : This species belongs to the *S. ultima* PUPL.-group. It is recognized by coloration of forewings (especially in female): the base of wings is golden creamy, apically forewings are brownish black. The structure of male genitalia is related to *S. aceris* FREY, however it can be distinguished by the form of valves.

D e s c r i p t i o n :

M a l e : Forewing length 1,5 - 1,7 mm. Head: frontal tuft brownish black or black. Eye-caps and collar greyish creamy. Antennae brownish grey or brown. Thorax and forewings greyish brown with some lustre. Apically forewings more fusous, brown. Undersides of forewings and cilia brown in color.

F e m a l e : Forewing length 1,8 - 2,1 mm. Head: frontal tuft yellowish orange or pale orange. Eye-caps and collar creamy or yellowish creamy. Antennae creamy to brownish creamy. Thorax whitish golden or goldish creamy. Basal parts of forewings colored in the same manner. Apically forewings brownish black. Undersides of forewings dark greyish brown. Cilia light apically. One type specimen has some differences in the pattern of forewings: basal parts greyish, in medial a creamy golden band is present, apically forewings are brownish black. Hindwings and their cilia brownish grey.

M a l e g e n i t a l i a : (fig. 5), Uncus and gnathos similar to *S. semiaurea*. Anterior lobes of vinculum narrow and tapering, slightly longer than in *S. semiaurea* sp.n. Valves with large blunt style. Inner side of

cuiller heavily papillated. Aedeagus long and slightly curved, with some large bands of numerous small cornuti.

F e m a l e g e n i t a l i a : (fig. 18), Similar to those as in *S. semiaurea* sp.n. but posterior apophyses slightly shorter, anterior processes of apophyses in comparison to *S. semiaurea* sp.n. are more or less narrow.

T y p e m a t e r i a l : Holotype, ♂, USSR, Tadjikistan, 30 km N Dushanbe, 20.VIII.1986, R. Puplesis. Paratypes, 2 ♂, 8 ♀, the same labels as holotype; 9.VII. - 20.VII.1986, R. Puplesis.

Stigmella acerna sp.n.

D i a g n o s i s : This species belongs to the *S. ultima* PUPL.-group. It is easily distinguished from other males in the group by long aedeagus and characteristic shape of valva.

D e s c r i p t i o n :

M a l e : Forewing length 1,8 mm. Head: frontal tuft pale orange in front and pale brown apically. Eye-caps and collar brightly creamy. Antennae brownish creamy. Thorax, uppersides of forewings and cilia brownish with yellowish creamy lustre. Undersides of forewings and hindwings brown. Cilia brownish, apically light and lustre.

F e m a l e : unknown.

M a l e g e n i t a l i a : (fig. 6). Uncus and gnathos similar to the ones of *S. semiaurea* sp.n. Anterior lobes of vinculum are in comparison to *S. semiaurea* sp.n. narrower apically, but not in basal part. Valves constricted and slightly curved apically, broadened basally. Aedeagus long, evenly narrowing to apex. Cornuti numerous and small, deposited in form of a broad band.

B i o l o g y : Hostplant. *Acer turcomanicum* POJARK.

T y p e m a t e r i a l : Holotype, ♂, USSR, Turkmenistan, Askhabad Region, 20 km N-E Kara-Kala, Iol-Dere, 30.VI.1952, N 288, V.I. Kuznetsov.

Stigmella aiderensis sp.n.

D i a g n o s i s : It belongs to the *S. salicis* STT.-group. The new

species is characterized by the coloration of forewings, primarily by basal parts of forewings, which are covered not only by brown scales, but also creamy scales (especially in females). Thorax almost creamy (especially in females). This new species is close to European *S. benanderella* WOLFF, *S. myrtilella* STT. and *S. salicis* STT., but differs in valves, which are apically bilobed. The two tapering teeth (cuiller and style) are not equally developed; the style is very well developed and is situated apically to the maximum. *S. aiederensis* sp.n. can be easily distinguished from *S. salicis* STT. and *S. myrtilella* STT. by long posterior apophyses of female.

D e s c r i p t i o n :

M a l e : Forewing length 2,4 - 2,6 mm. Head: frontal tuft probably light, orangish (frontal tuft in type specimens is down off). Eye-caps whitish creamy. Antennae brownish. Thorax mixed, covered by brown and creamy scales. Forewings similar to thorax, but basal parts of forewings richer in creamy scales. Forewings just beyond middle with broad creamy band, without strict boundaries and broken sometimes. Cilia light. Hindwings and its cilia brownish.

F e m a l e : Forewing length 2,2 - 2,5 mm. Head: frontal tuft yellowish orange to pale orange, apically usually brownish. Antennae brown or brownish. Thorax almost creamy, usually with some brown scales. Forewings similar to male ones, but usually lighter. The creamy band varies greatly in its own form. Cilia brown or lightly brown. Hindwings and their cilia brown or brownish.

M a l e g e n i t a l i a : (fig. 8). Uncus gradually tapering, bilobed with slight papillated lobes. Gnathos with a pair of medial horn-like processes. Vinculum anteriorly slightly bilobed, lobes broad, triangular, Valves apically bilobed. The style is very well developed, cuiller like a triangular tooth. Horizontal bar of transtilla well developed, lateral arms long and rather wide. Aedeagus slightly extended in apical part, vesica with several (about 6) various spine-like cornuti.

F e m a l e g e n i t a l i a : (fig. 19). Posterior apophyses are approximately equal in length when compared with anterior apophyses. Bursa copulatrix elongated, with band-shaped signum.

B i o l o g y : Hostplant. *Salix* sp.

Mine: much contorted wide gallery (fig. 7).

Cocoon pale brown.

T y p e m a t e r i a l : Holotype, ♂, USSR, Turkmenistan, Ashgabat Region, 50 km E Kara-Kala, Ai-Dere, larvae on *Salix*, 12.V.1984, ex pupa 26.V.1984, P. Ivinskis. Paratypes, 1 ♀, the same labels as holotype ex pupa 30.V.1984, P. Ivinskis, 1 ♂, 5 ♀, Ai-Dere, N 69, 11.-15.V.1952, V.I. Kuznetsov.

Stigmella kondarai sp.n.

D i a g n o s i s : It belongs to the *S. salicis* STT.-group and is related with *S. aiederensis* sp.n. and *S. juratae* sp.n. The new species is externally characterized by a more darker appearance. Strongly stretched and sclerotized uncus, anterior lobes of vinculum which are not as big as *S. juratae* sp.n. ones, are characteristics of male genitalia.

D e s c r i p t i o n :

M a l e : Forewing length 2,3 mm. Head: frontal tuft yellowish orange. Eye-caps whitish creamy. Antennae brown. Thorax and forewings dark, greyish creamy scales mixed with dark brown scales (therefore the forewings seem to be "duty"). Hindwings and cilia slightly brownish grey.

F e m a l e : unknown.

M a l e g e n i t a l i a : (fig. 9). Uncus strongly stretched and well sclerotized, apically bilobed. Gnathos with a pair of very long medial horn-like processes. Vinculum anteriorly with two more or less triangular lobes. Valves are similar to ones of *S. aiederensis* sp.n. Aedeagus not extended in apical part, vesica with several (about 6-7) various spine-like cornuti.

T y p e m a t e r i a l : Holotype, ♂, USSR, Tadzhikistan, 30 km N Dushanbe, 8.VIII.1986, R. Puplesis.

Stigmella juratae sp.n.

D i a g n o s i s : This species belongs to the *S. salicis* STT.-group. It is mostly related to *S. aiederensis* sp.n., but easily distinguished from it and all other species of this group by the characteristic (almost creamy) pattern of forewings and structure of genitalia, primarily very large vinculum lobes. Gnathos is typical, its medial horn-like processes are situated extremely near to each other.

D e s c r i p t i o n :

M a l e : Forewing length 2,9 mm. Head: frontal tuft slightly brownish. Eye-caps whitish creamy. Antennae brownish. Thorax yellowish creamy. Forewings generally yellowish creamy. Only apical parts of forewing remain brown, there are some brown scales on forewings too. Cilia light, slightly greyish. Hindwings yellowish creamy, its cilia brownish grey.

F e m a l e : unknown.

M a l e g e n i t a l i a : (fig. 10). Uncus gradually tapering, bilobed, with small lobes papillated, Gnathos with a pair of medial horn-like processes. They are situated extremely near to each other. Valves have similarity with those of *S. kondarai* sp.n., but are more tapering apically. Lateral arms of transtilla badly developed compared with horizontal bar. Aedeagus slightly fastened in apical part, vesica with several (about 3-4) long and various spine-like cornuti.

T y p e m a t e r i a l : Holotype, ♂, USSR, Tadjikistan, 30 km N Dushanbe, 21.VIII.1986, R. Puplesis.

Ectoedemia ingloria sp.n.

D i a g n o s i s : This species belongs to the *E. subbimaculella* HAW. group, related to *E. heringella* MARIANI and *E. ilicis* MENDES. The new species is separated from them and all other species of the group by a greyish creamy band on forewings and characteristic form of valves.

D e s c r i p t i o n :

M a l e : Forewing length 2,4 - 2,6 mm. Head: frontal tuft pale orange or brownish orange. Eye-caps whitish creamy. Antennae brown. Thorax and forewings dark, and densely covered with brownish black scales. There is a greyish creamy band in medial of forewing. The band is sometimes slightly fastened in the middle. Hindwings greyish brown. Cilia grey.

F e m a l e : unknown.

M a l e g e n i t a l i a : (fig. 11). Tegumen distinctly produced into rounded pseuduncus. Gnathos with central element divided, distal part spatulated, basal part with separate margin. Valves resemble to ones of *E. heringella* MARIANI. Aedeagus carinae single.

Type material: Holotype, ♂, USSR, Tadjikistan, 30 km N Dushanbe, 20.VIII.1986, R. Puplisis. Paratypes, 2 ♂. The same labels as holotype, 30.VI.-7.VII.1986, R. Puplisis.

Ectoedemia insignata sp.n.

Diagnosis: One basal creamy white spot together with a creamy white fascia on forewings separates *E. insignata* sp.n. from the majority of *Ectoedemia* species. From *E. caradjai* GROSCHKE, *E. leucothorax* VAN NIEUKERKEN, *E. heringella* MARIANI and *E. phyllotomella* KLIMESCH, the new species is distinguished by the presence of a brown hair-pencil and brown lamellar androconical scales on the hindwing upperside. This species is related to *E. petrosa* sp.n., but the dark frontal tuft of *E. insignata* sp.n. separates it immediately from *E. petrosa* sp.n., which has a yellowish orange or pale orange tuft. The tegumen of the new species is produced into quite long triangular pseuduncus.

Description:

Male: Forewing length 2,2 - 2,5 mm. Head: frontal tuft brown or dark brown, frontally may be orangish. Eye-caps and collar creamy. Antennae pale brown, lighter in upperside. Thorax whitish creamy with some brownish scales basally. Background of forewings creamy, but blackish brown scales densely cover forewings. In its middle there is a creamy band without strict bound. On the back side of basal part of forewings there is a more or less irregular oval creamy spot. Cilia greyish creamy. Hindwings and cilia greyish brown or brown. There is a brown hair-pencil and zone of ochreous brown androconical scales on hindwings upperside.

Female: Forewing length 2,3 - 2,5 mm. Colorations same as in male. Unlike in males antennae are whitish in upperside. Generally, females are more light in appearance than males (the spots or bands on forewings usually extend into large zones).

Male genitalia: (fig. 12). Tegumen is distinctly produced into rather large triangular pseuduncus, which is rounded apically. Gnathos with broad central element. Valves have some resemblance with *E. heringella* MARIANI. Aedeagus extended basally and with two single carinae apically.

Female genitalia: (fig. 20,21). Vaginal sclerite in vestibulum with two processes, one of them badly sclerotized and broad.

T y p e m a t e r i a l : Holotype, ♂, USSR, Tadjikistan, 30 km N Dushanbe, 27.VI.1986, R. Puplesis. Paratypes, 11 ♂, 6 ♀, the same labels as holotype, 27.VI.-21.VIII.1986, R. Puplesis.

Ectoedemia petrosa sp.n.

D i a g n o s i s : This species differs externally from similar *E. insignata* sp.n. by its smaller size and yellowish orange frontal tuft. The new species can be distinguished by the pseuduncus which has the form of the trapezium more or less, also by form of valvae and slightly curved ventral arms of transtilla.

D e s c r i p t i o n :

M a l e : Forewing length 1,7 - 1,9 mm. Head: frontal tuft lightly orange to orange. Eye caps and collar creamy, sometimes slightly orangish. Antennae pale brown, light in upperside. Thorax brown. Forewings covered by blackish brown scales. There is a whitish creamy band in the middle of forewings. Medially band slightly fastened. There is a whitish creamy spot on the back side of basal part of forewings too. Cilia greyish creamy or grey. Hindwings usually greyish brown. There is a dark brown hair pencil and zone of chreous brown androconial scales on the upperside of hindwings and small elongated pale ochreous spot of androconial scales on the upperside of hindwings too.

F e m a l e : Forewing length 1,7 - 1,9 mm. Head: frontal tuft orange. Eye-caps creamy. Antennae dark brown on the upperside and almost creamy on the bottomside. Thorax and wings same as in males.

M a l e g e n i t a l i a : (fig. 13). Pseuduncus more or less in form of a trapezium. Gnathos with broad central element. Valves slightly curved medially. Lateral arms of transtilla are slightly curved distally. Anterior lobes of vinculum small, but broadly rounded. Aedeagus extended basally. Carinae is single and slightly curved distally.

F e m a l e g e n i t a l i a : (fig. 22,23). Resemble to those of *E. insignata* sp.n. Vaginal sclerite in vestibulum with two processes, but both are not broad.

T y p e m a t e r i a l : Holotype, ♂, USSR, Tadjikistan, 30 km N Dushanbe, 14.VIII.1986, R. Puplesis. Paratypes, 52 ♂, 7 ♀, the same labels as holotype, 28.VI.-21.VIII.1986, R. Puplesis.

Tischeria longispicula sp.n.

D i a g n o s i s : This species is related to *T. longiciliatella* REBEL, but easily distinguished by narrow and very long saccus.

D e s c r i p t i o n :

M a l e : Forewing length 2,3 - 2,6 mm. Head: whitish, there are only some tufts of brown scales near antennae and around. Antennae brown. Thorax and forewings brown generally. Small darkish spot on the back side of apical part of forewings is not rare. Usually the darkish spot is irregularly surrounded by some small creamy areas.

F e m a l e : Forewing length 2,5 - 3,0 mm. Coloration same as male.

M a l e g e n i t a l i a : (fig. 14). Uncus large with two triangular lobes. Apical angles of lobes are curved proximally. Saccus tapering into narrow and very long process (about 1/3 of aedeagus length). Valves large, fastened in basal part. There are numerous small chaetae on the inside of apical part of valves. Aedeagus resembles *T. longiciliatella* REBEL.

F e m a l e g e n i t a l i a : (fig. 24). They are similar to *T. gaudacella* DUP. and *T. longiciliatella* REBEL. Apical and posterior apophyses are slightly rounded in apically.

T y p e m a t e r i a l : Holotype, ♂, USSR, Turkmenistan, S-W Ashgabat, environments Firiusa, 10.V.1986, R. Puplesis. Paratypes, 1 ♂, USSR, Uzbekistan, Surchandarya Region, environments Derbent, 18.V.1985, R. Puplesis; 4 ♂, 2 ♀, USSR, Turkmenistan, S-W Ashgabat, environments Firiusa, 8.-11.V.1986, 2 ♀, USSR, Tadjikistan, 30 km N Dushanbe, 15.-22.VII.1986, R. Puplesis.

Summary

The description of 10 new species of the Nepticulidae and 1 new species of the Tischeriidae (*Tischeria longispicula* sp.n.) from Tadjikistan, Uzbekistan and Turkmenistan (USSR) are given. Most of the new nepticulid moths belong to the genus *Stigmella* SCHRANK (*S. klimeschi* sp.n., *S. semiaurea* sp.

n., *S. bicolor* sp.n., *S. acerna* sp.n., *S. aiderensis* sp.n., *S. kondarai* sp.n., *S. juratae* sp.n.). Three new species are described in the genus *Ectoedemia* BUSCK (*E. ingloria* sp.n., *E. insignata* sp.n., *E. petrosa* sp.n.).

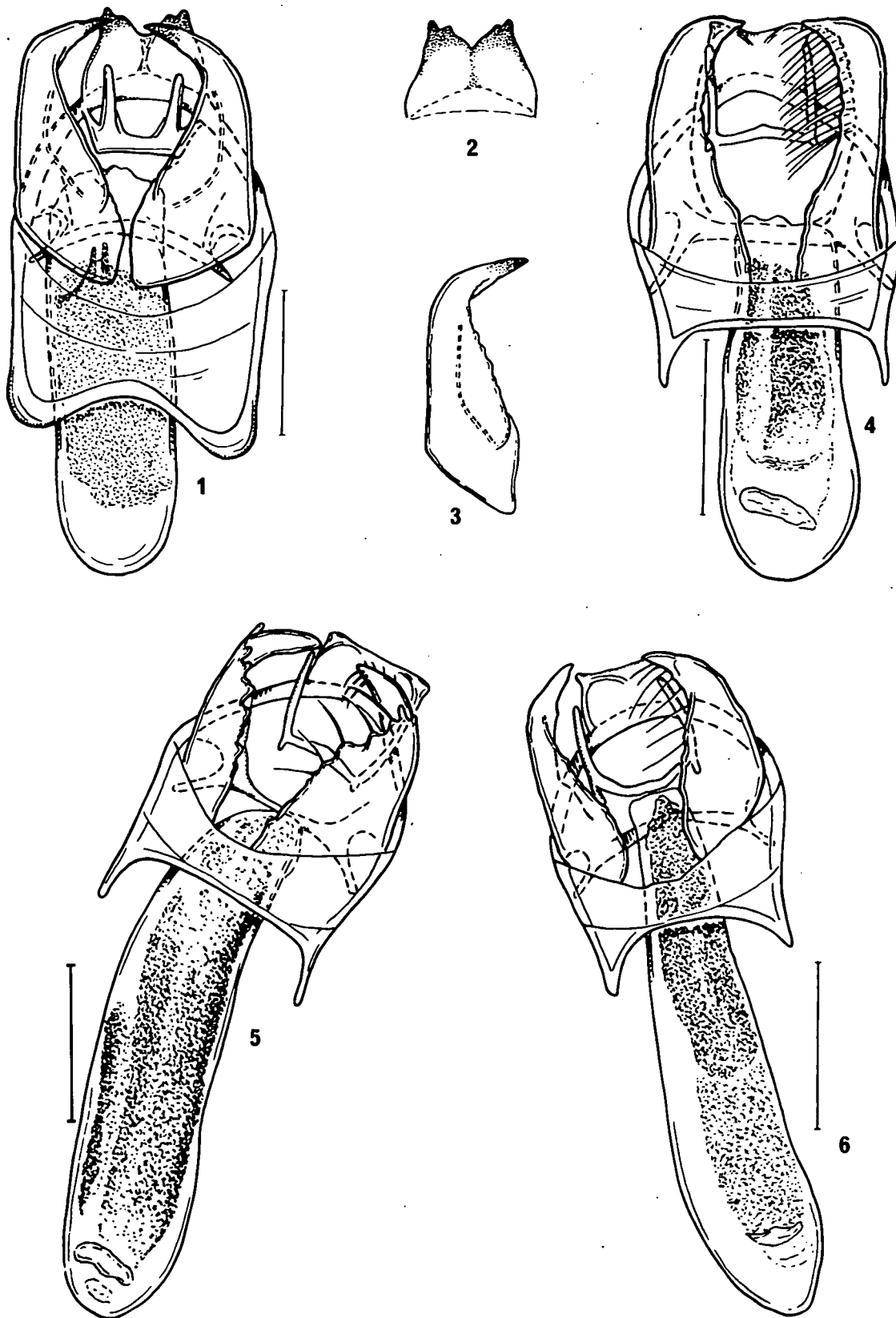
Descriptions of the new species are given together with drawings of the male and female genitalia.

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Address of the author: Rimantas PUPLESIS
Zoologijos katedra VVPI
Studentu 39, Vilnius 34
Lithuanian SSR 232034
USSR



Figs. 1-6. Male genitalia of new species (holotypes). 1- *Stigmella klimeschi* sp.n.; 2- same, uncus; 3- same, valva; 4- *S. semiaurea* sp.n.; 5- *S. bicolor* sp.n.; 6- *S. acerna* sp.n. (scale: 0.1 mm)

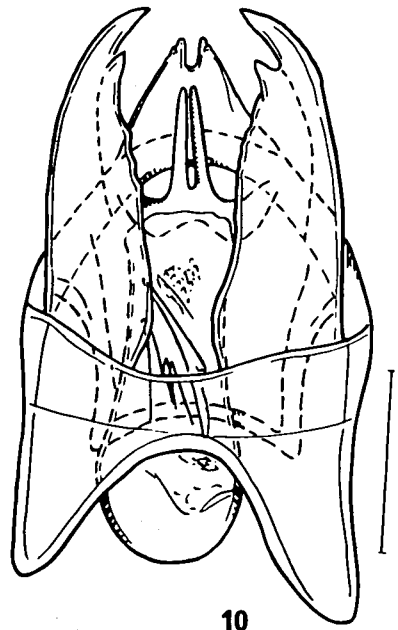
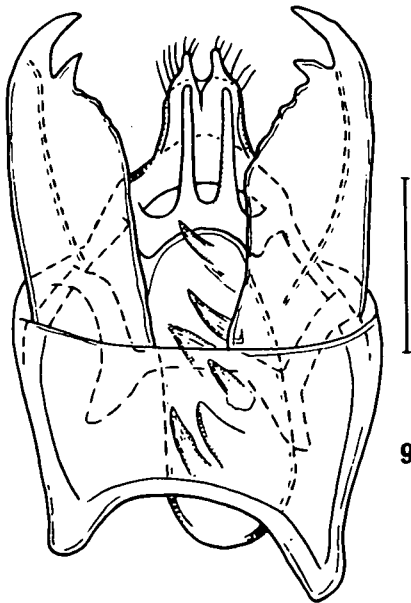
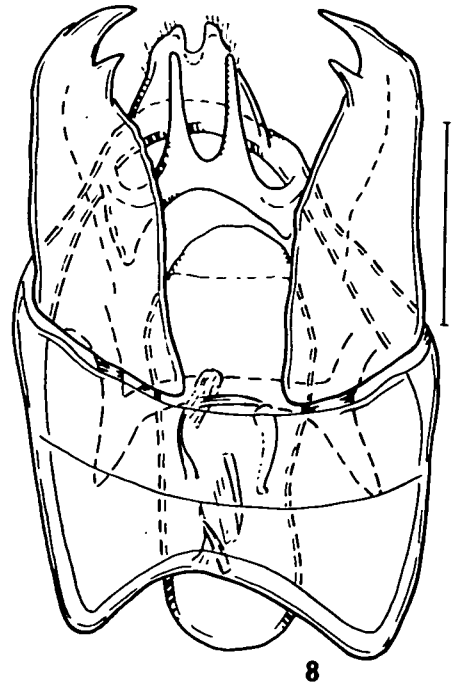
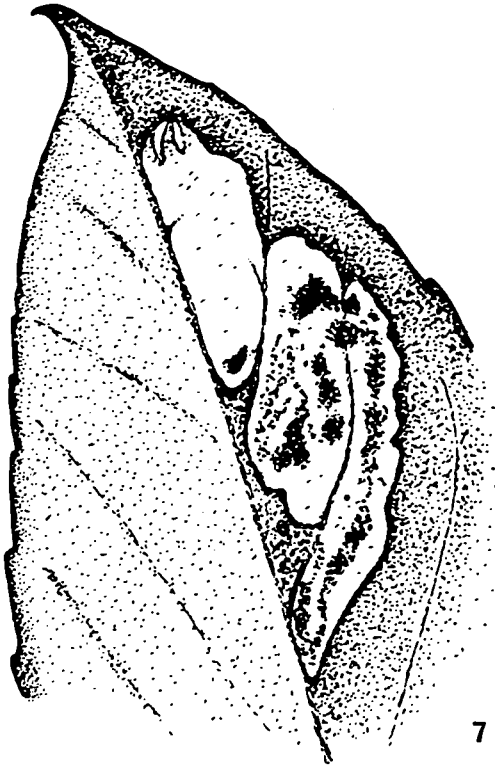
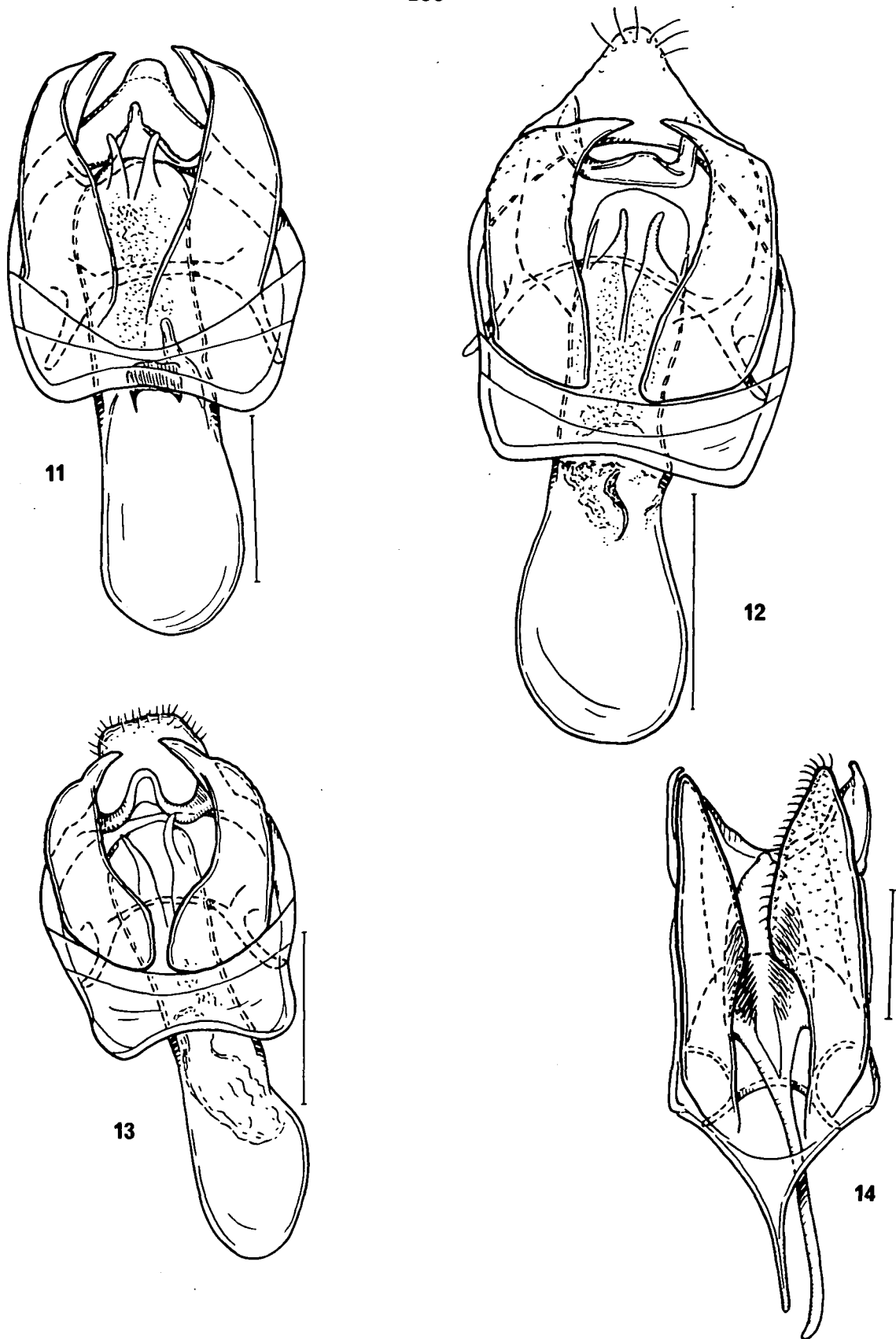
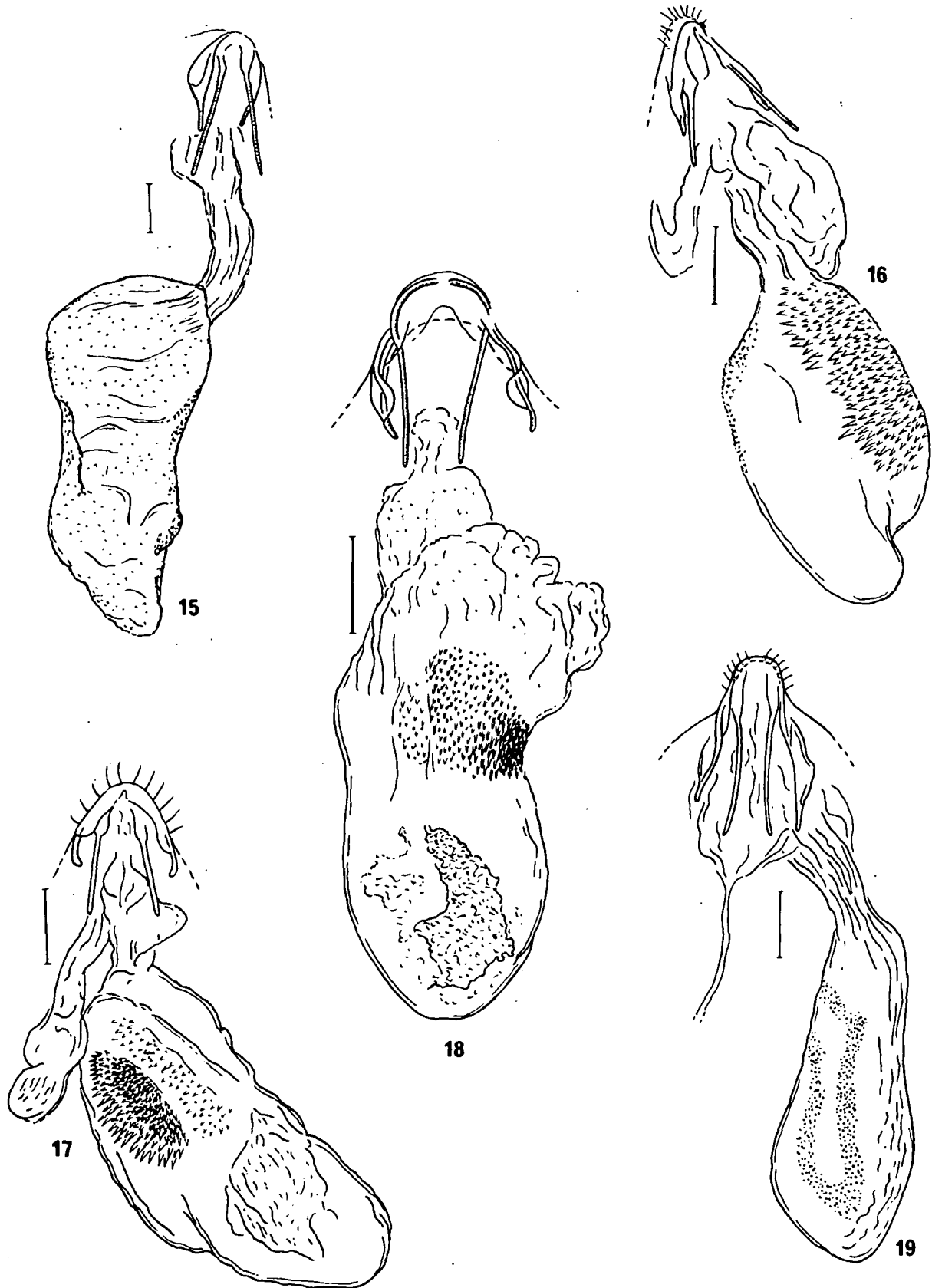


Fig. 7. Mine of *Stigmella aiderensis* sp.n. on leaf of *Salix* (12.V.1984, Ai-Dere, Askhabad Region).

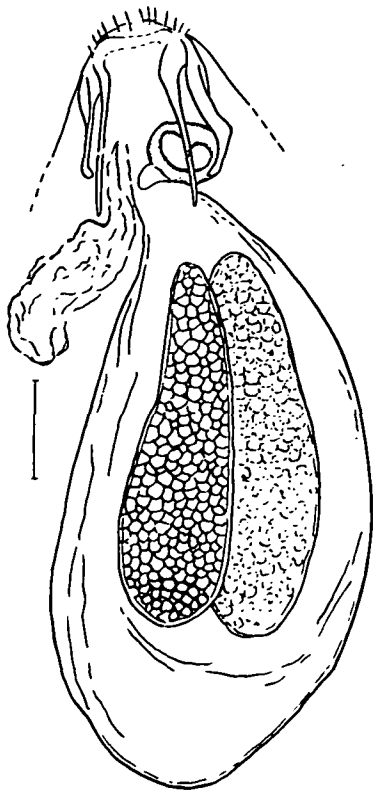
Figs. 8-10. Male genitalia of new species (holotypes). 8- *Stigmella aiderensis* sp.n.; 9- *S. kondarai* sp.n., 10- *S. juratae* sp.n. (scale: 0.1 mm)



Figs. 11-14. Male genitalia of new species (holotypes). 11- *Ectoedemia ingloria* sp.n.; 12- *Ectoedemia insignata* sp.n.; 13- *E. petrosa* sp.n.; 14- *Tische-
ria longispicula* sp.n. (scale: 0.1 mm)



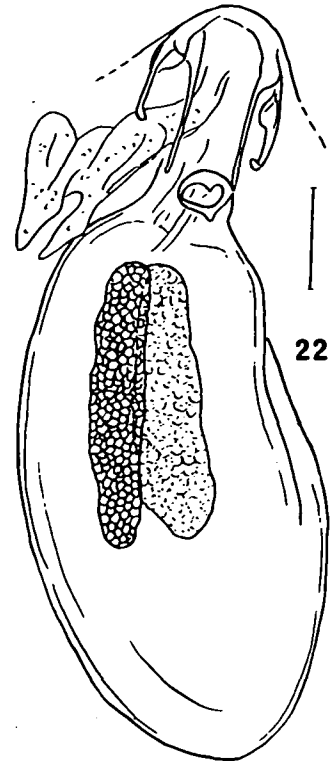
Figs. 15-19. Female genitalia of new species (paratypes). 15- *Stigmella klimeschi* sp.n.; 16,17- *S. semiaurea* sp.n.; 18- *S. bicolor* sp.n.; 19- *S. aiederensis* sp.n. (scale: 0.1 mm)



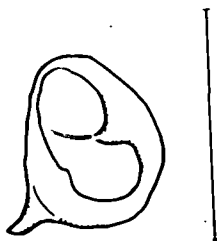
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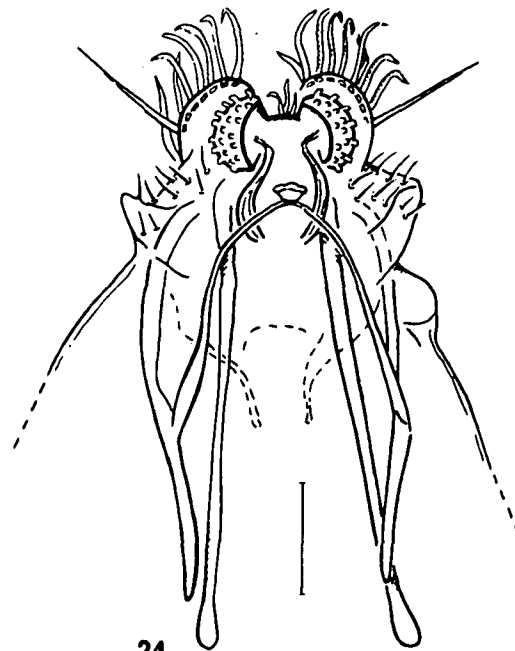
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Figs. 20-24. Female genitalia of new species (paratypes). 20- *Ectoedemia insignata* sp.n.; 21- same, vaginal sclerite; 22- *E. petrosa* sp.n.; 23- same, vaginal sclerite; 24- *Tischeria longispicula* sp.n. (scale: 0.1 mm)

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Autor(en)/Author(s): Puplesis Rimantas

Artikel/Article: [New Species of Plant Mining Lepidoptera \(Nepticulidae, Tischeriidae\) from Central Asia 273-290](#)