

## Taxonomy and identification of *Elachista cingillella* (Herrich-Schäffer, 1855) and its close relatives (Lepidoptera: Elachistidae), with descriptions of two new species

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The *Elachista cingillella* complex is defined and diagnosed. The identity of *E. cingillella* (Herrich-Schäffer, 1855) is clarified, and *E. densicornella* Hodgkinson, 1879 is confirmed to be a junior synonym of it. Redescriptions are given for the closely related, little known or misunderstood species *E. fasciola* Parenti, 1983 and *E. nedaella* Traugott-Olsen, 1985. *Elachista metella* Kaila sp. n. is described from Croatia and *E. sutteri* Kaila sp. n. from Samos, Greece. *E. cingillella* is a rarely found species distributed in central and northern Europe. All checked records of it from the Mediterranean region are based on misidentified specimens of *E. metella* sp. n., which is widely distributed in southern Europe and southern parts of central Europe. *E. fasciola* Parenti is distributed from Eastern Europe to Japan. *E. nedaella* Traugott-Olsen is only known from Crete, *E. sutteri* sp. n. from eastern Greece.

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### 1. Introduction

Moths belonging to the Elachistinae (Elachistidae) share the typical characteristics of the superfamily Gelechioidea in having sickle-shaped ascending labial palpi, a smooth-scaled head and a basally scaled tongue. Compared to other gelechioids, their size is small, with a wingspan usually between 6 to 14 mm, their forewing shape is lanceolate and hindwing acute-tipped. In this paper we attempt to clarify the taxonomy of *Elachista cingillella* (Herrich-Schäffer, 1855) and its close

relatives. The species treated in the present paper belong to those species of the large genus *Elachista* that usually have a characteristic transverse whitish or yellowish band in their otherwise dark grey forewing. Alternatively, the forewing may be unicolorous yellow or pale ochreous with faint or no track of the pale transverse fascia. The larvae of these species are solely leaf-miners of grasses, as are all other species in the subgenus *Apheloseitia* of the genus *Elachista*. Their identification is, as the case often is among the generally small and sombre-coloured *Elachista*

species, rather difficult and may require study of genital characteristics. Even examination of the genitalia may be difficult and correct identifications will require good optical equipment. For this reason, misidentifications are common in collections and, unfortunately, are not absent in the literature either.

## 2. Notes on systematics of the *Elachista unifasciella* group, and definition of the *E. cingillella* complex

Traugott-Olsen & Nielsen (1977) defined the *E. unifasciella* subgroup of the *E. bedellella* group for those species of *Elachista* that have one white or yellow transverse fascia across their otherwise dark grey forewing. Kaila (1999) placed this group in the subgenus *Apheloseitia* of *Elachista*. The monophyly of the *E. unifasciella* group is, however, uncertain, since no synapomorphies have been found to unite the group as a whole. Indeed, in the analysis of Kaila (1999) the group appeared polyphyletic within *Elachista* (*Apheloseitia*). A majority of the species within the *E. unifasciella* group sensu Traugott-Olsen & Nielsen (1977) do form a uniform and probably monophyletic clade. They have a well developed pair of sclerotised lobes, called the manica, covering the caecum of the aedeagus. Within Elachistinae the paired manica is otherwise present in a few basal species of *Elachista* (*Elachista*) (L. Kaila, unpubl.), in some *Elachista* (*Dibrachia*) and almost invariably in the genus *Perittia*, in most species of which it is, however, stalked. The present knowledge of the distribution of this character within the Elachistinae suggests that although it is somewhat homoplastic it seems useful in defining and delimiting the clades where it occurs.

In addition to the species treated in the present paper, the following species of the *E. unifasciella* group having the manica are *E. bisulcella* Duponchel, *E. adscitella* Stainton, *E. gangabella* Zeller, *E. obliquella* Stainton (= *E. megerlella* auct., nec Hübner), *E. subalbidella* Schläger, *E. heinemannii* Frey, *E. revinctella* Zeller, *E. pollutissima* Staudinger, *E. istanella* Nielsen & Traugott-Olsen and *E. tinctella* Sinev & Sruoga. The distribution of the group is Palaearctic, only *E. subalbidella* also occurring in North America

(Kaila 1997). Of the species included in the *E. unifasciella* group by Traugott-Olsen & Nielsen (1977), *E. unifasciella* Haworth and *E. chrysodesmella* Zeller do not possess the manica. The close relationship between *E. unifasciella* and the other species treated here can also be questioned due to the presence of a cornutus in the aedeagus of *E. unifasciella* while no other species in this group has cornuti. Furthermore, the corpus bursae of *E. unifasciella* contains three signa while in the other species there are two signa. *E. chrysodesmella* has, in turn, a tongue-shaped posteriorly directed median pocket in the median plate of juxta which is otherwise present in another group within *Elachista* (*Apheloseitia*). Kaila (1997) grouped these species under *E. bedellella* group, therefore using a narrower concept of this group than Traugott-Olsen & Nielsen (1977). Since *E. unifasciella* Haworth, the 'nominal species' of the *E. unifasciella* group, is not among the species having the manica, we consider relevant to use another informal name, the *Elachista cingillella* complex, for the probably monophyletic group of species possessing the manica. Following this character evidence, we suggest that *E. chrysodesmella* Zeller is provisionally placed in the *E. bedellella* group sensu Kaila (1997), and *E. unifasciella* Haworth in the *E. argentella* group sensu Kaila (1997). At present neither of these species can be placed further in any named complex.

## 3. Diagnosis of the *E. cingillella* complex

*Head.* Smooth-scaled, neck tuft weakly raised. Tongue basally scaled, length less than the diameter of head. Maxillary palpi vestigial, 2-segmented. Lateral external ocelli present [Kaila (1999) erroneously states that they are absent in *E. adscitella* Stainton]. Antenna extended to about 2/3 of the forewing, scape with pecten consisting of a row of elongate, stiff hair-like scales; flagellum without visible ciliation. Length of labial palpus 1–1.2 times the diameter of head.

*Thorax.* Forewing acute; five costally directed R-veins present; M1 stalked with R; M2 free, from the end of cell; CuA1 and CuA2 present. Hindwing broadly lanceolate, cell open or closed by a vestigial vein; M2, CuA1 and CuA2 in common stalk. Tarsal articles with three spines distally.

*Pregenital abdomen.* Tergum 8 of male anteriorly narrowly sclerotised.

*Male genitalia.* Uncus lobes distolaterally with a group of small setae arising from flat pinaculae at ventral surface. Socius present as a small group of about 10 small spinules. Basal arms of gnathos fused medially; lobes of the spinose knob of gnathos entirely fused forming a single knob of varying shape. Anellus not present. Transtilla formed of medially projected hook-like appendices of valval costa. Valva with a medially projected process on ventral surface, tip of which is fused with lateral apex of juxta lobes; basal fold of costa vestigial extended at most to 1/3 length of valva, distal fold extended to about 3/4 of valva where it becomes invisible. Median plate of juxta concave without median or lateral pockets; juxta lobes variably elongate, distally with a group of setae. Elongate setose digitate process between median plate of juxta and ventral surface of valva. Aedeagus not ankylosed, caecum with paired lobes of manica; without cornuti.

*Female genitalia.* Papillae anales broad triangular, basally somewhat sclerotised, ventrally joined by Y- or X-shaped sclerotisation. Ostium bursae in anterior margin of sternum 8; no distinctive antrum present; ductus seminalis membranous, tubular, incepted to ductus bursae anterior to colliculum; ductus bursae tubular, membranous, straight; corpus bursae with or without internally directed spines; with a pair of signa formed either of spine groups or dentate sclerotised plates.

#### 4. Taxonomy of the *E. cingillella* complex

The taxonomy of the European species of the *E. unifasciella* subgroup long remained unsettled until Bradley (1963) clarified the identity of several nominal species. Among other taxonomic changes, he established the synonymy of *E. densicornella* Hodgkinson (misspelled as *densicornuella*, an error that has persisted in subsequent publications) with *E. cingillella* (H. S.). In his paper, the male genitalia of the lectotype of *E. densicornella* are depicted as a representative of *E. cingillella*. However, in the revision of the Elachistidae of Fennoscandia and Denmark, Traugott-Olsen & Nielsen (1977) illustrated some-

what different male genitalia for *E. cingillella* as compared to those given by Bradley (1963). Most male specimens identified as *E. cingillella* in various collections resemble the genital illustration by Traugott-Olsen & Nielsen (1977), but the associated females have different signa. Kyrki (1979) reported a species close but not identical to *E. cingillella* that occurred in Finland and The Republic of Karelia in Russia, but the scarcity of specimens available prevented him from making any definitive taxonomic conclusions on the identity of these specimens. He pointed out differences in the shape of the male valva as well as the digitate process and the female signa as compared to those illustrated by Traugott-Olsen & Nielsen (1977). Later, Parenti (1983) described *E. fasciola* from Japan, in the text somewhat misleadingly comparing it to *E. heinemannii* Frey and *E. revinctella* Zeller. Comparison of the text and illustrations of *E. fasciola* does not enable its separation from the type of *E. densicornella* as illustrated by Bradley (1963). Sachkov (1995) reported *E. fasciola* to occur in Samara Region, European Russia, and according to Parenti (1996) it also occurs in Slovakia and Italy. Traugott-Olsen (1985) described *E. nedaella* from specimens collected in Crete. Parenti (1996) does not give any further records for this species, although specimens collected from, e.g. Croatia and Italy, and identified as *E. nedaella* by Traugott-Olsen occur in various collections. Comparison of the illustration of the male genitalia of the holotype of *E. nedaella* with that representing *E. cingillella* in (Traugott-Olsen & Nielsen 1977) gives little clues how to identify these species, nor does the text in Traugott-Olsen (1985) give any statements of the closeness or identification of these species.

To conclude, the taxonomy of *E. cingillella* and a few of its close relatives has been obscure. Correct identification of these species is next to impossible due to ambiguous and even contradictory literature statements on the identity of the nominal species, as well as due to the absence of any publication where these species would be compared to each other. To clarify the real identity of these species we have now re-examined the type material of *E. cingillella*, *E. densicornella*, *E. nedaella* and *E. fasciola*. We have also examined a number of other specimens belonging to this complex. As a result, we suggest that six valid

species are involved: *E. cingillella* (Herrich-Schäffer) (= *E. densicornella* Hodgkinson [revised synonymy]), *E. fasciola* Parenti, *E. istanella* Nielsen & Traugott-Olsen, *E. nedaella* Traugott-Olsen, *E. metella* Kaila and *E. sutteri* Kaila. *E. istanella* Nielsen & Traugott-Olsen is not further treated in this paper as it is well introduced by Nielsen & Traugott-Olsen (1987). *E. cingillella* is distributed in central and northern Europe, to the Ural Mts. in the east. All specimens identified as *E. cingillella* from the Mediterranean region that we have checked belong to *E. metella* which has a wide distribution range in southern Europe, up to Slovakia in the North. *E. fasciola* Parenti is distributed from eastern Europe to Japan. *E. nedaella* is only known from Greece, Crete, and *E. sutteri* from eastern Greece, including Cyprus.

These species are morphologically close to certain other species in the *E. unifasciella* subgroup, notably to *E. bisulcella* Duponchel, *E. adscitella* Stainton, *E. subalbidella* Schläger and *E. heinemannii* Frey. These species are adequately presented in recent literature, e.g. Traugott-Olsen & Nielsen (1977) (in this reference *E. adscitella* is, however, called erroneously *E. revinctella*), Klimesch (1990) and Parenti (1992). Therefore, they are not treated further in this paper.

The material was obtained from the following collections:

- BMNH The Natural History Museum, London, U.K. (K. R. Tuck).  
 MHNG Muséum d'Histoire Naturelle, Genève, Switzerland (B. Landry).  
 MNHB Museum für Naturkunde, Humboldt-Universität Berlin, Germany (W. Mey).  
 MZLU Museum of Zoology, Lund University, Sweden (R. Danielsson).  
 OPU Osaka Prefecture University, Sakai, Osaka, Japan (K. Hirowatari).  
 TLMF Tiroler Landesmuseum Ferdinandeum, Innsbruck, Austria (P. Huemer).  
 ZMH Finnish Museum of Natural History, Zoological Museum, University of Helsinki, Finland (L. Kaila).  
 ZMUC Zoological Museum, University of Copenhagen, Denmark (O. Karsholt).  
 ZMUO Zoological Museum, University of Oulu, Finland (J. Itämies).  
 Personal collections of B. Å. Bengtsson (Färjestaden, Sweden), P. Grotenfelt (Grankulla,

Finland), J. Junnilainen (Vantaa, Finland), J.-P. Kaitila (Vantaa, Finland), A. & J. Kullberg (Helsinki and Espoo, Finland), J. Liška (Praha, Czech Republic, specimens donated to ZMH), T. & K. Nupponen (Espoo, Finland) and R. Sutter (Bitterfeld, Germany, specimen donated to ZMH).

## 5. Identification of the species

There appear to be slight differences in the outer appearance among the species of the *E. cingillella* complex, but due to individual variation some overlap exists among them. However, *Elachista cingillella* seems to have an invariably dark grey head and neck tuft, while the head of the other species treated here is whitish or pale ochreous, sometimes mottled by grey scales. A safe identification of the species will usually require the study of the genitalia. All these species possess specific characters in both their male and female genitalia (note that the female of *E. sutteri* is unknown). Using the shape of the juxta lobes in the males, and the signa in the females the species can be divided into two species pairs: *E. cingillella* and *E. fasciola* have distally bilobed juxta lobes and signa formed as a pair of dentate plates; *E. nedaella* and *E. metella* have distally shallowly indented juxta lobes and the signa formed as a pair of spine groups. In *E. cingillella* and *E. fasciola* the overall size of the digitate process of the male is larger, being extended to 1/3 of the length of the valva, as compared to that of *E. nedaella* and *E. metella*. The digitate process is club-shaped in *E. sutteri*, distally oblique and tapered to a more or less pointed apex at dorsal margin in the other species.

### 5.1. Identification keys

The European *Elachista* species that have grey forewing with one white or yellowish transverse fascia are included in the keys.

#### 5.1.1. Key to males

1. Aedeagus with a pair of lobes at caecum, called a manica ..... 2
- Aedeagus without manica ..... 12

2. Neck tuft white (figure 1 in Parenti [1992]) ..... 3  
 — Neck tuft grey ..... 4
3. Digitate process prolonged to form a beak-shaped apex (figure 3, above in Parenti [1992]) .....  
 ..... *E. adscitella* Stainton  
 — Digitate process tongue-shaped, distally blunt (figure 3, below in Parenti [1992]) ..... *E. revinctella* Zeller
4. Digitate process distally evenly rounded (e.g. Figs. 42, 44) ..... 5  
 — Distal margin of digitate process oblique, digitate process longest at dorsal margin (e.g. Figs. 5, 14, 16, 18, 27, 34, 36) ..... 8
5. Juxta lobes medially distinctly prolonged (figure 353 in Traugott-Olsen & Nielsen [1977]) .....  
 ..... *E. obliquella* Stainton (= *E. megerlella* auct.)  
 — Juxta lobes not medially prolonged ..... 6
6. Juxta lobes twice as long as broad; costa of valva distinctly convex, distal margin of cucullus of valva straight (Figs. 41–44) ..... *E. sutteri* Kaila  
 — Juxta lobes about as long as wide, costa of valva not markedly convex; cucullus of valva more or less rounded ..... 7
7. Forewing fascia medially angled (figure 6 in Nielsen & Traugott-Olsen [1987]); aedeagus curved (figure 8 in Nielsen & Traugott-Olsen [1987]) *E. istanella* Nielsen & Traugott-Olsen  
 — Forewing fascia narrowest at costal margin, straight (figure 114 in Traugott-Olsen & Nielsen [1977]; aedeagus straight (figure 358 in Traugott-Olsen & Nielsen [1977]) ..... *E. gangabella* Zeller
8. Juxta lobes distally deeply bilobed; digitate process with longitudinal ridge from base to dorsal apex at ventral surface (Figs. 5, 14, 16, 18) ..... 9  
 — Juxta lobes nearly straight or with a low swelling mesially; ventral surface of digitate process without longitudinal ridge (Figs. 27, 34, 36) ..... 10
9. Head grey; juxta lobe distally with narrow tongue-shaped lobe; digitate process very expanded at distal half, extended to 2/5 length of valva (Figs. 3, 5); costa of valva deeply emarginated at 3/4 length (Figs. 3, 4); distal 1/4 of aedeagus gradually tapered to a pointed apex (Figs. 3, 4) ..... *E. cingillella* (Herrich-Schäffer)  
 — Head creamy white, variably mottled with brownish grey scales especially above; juxta lobe distally with long triangular lobe; digitate process extended to 1/3 length of valva; costa of valva concave but not deeply emarginated at 3/4 length; aedeagus distally prolonged as pointed, narrow triangular apex (Figs. 13–18) .....  
 ..... *E. fasciola* Parenti
10. Digitate process distally strongly produced, long beak-shaped; gnathos almost as broad as long (figures 364–365 in Traugott-Olsen & Nielsen [1977]) .....  
 ..... *E. bisulcella* (Duponchel)  
 — Digitate process distally shortly produced; gnathos longer than broad (Figs. 25–27, 33–36) ..... 11
11. Gnathos narrow and elongate, 3–4 times longer than wide; digitate process distally broadened (Figs. 33, 35) .....  
 ..... *E. metella* Kaila  
 — Gnathos broad, 1.5 times longer than wide (Figs. 25, 26); digitate process nearly parallel-sided .....  
 ..... *E. nedaella* Traugott-Olsen
12. Aedeagus with one distinctive cornutus; median plate of juxta without tongue-shaped posteriorly directed sac (figures 356–357 in Traugott-Olsen & Nielsen [1977]) .....  
 ..... *E. unifasciella* (Haworth)  
 — Aedeagus without cornuti, median plate of juxta with tongue-shaped posteriorly directed sac (figures 351–352 in Traugott-Olsen & Nielsen [1977]) .....  
 ..... *E. chrysodesmella* Zeller

### 5.1.2. Key to females

Note that the female of *E. sutteri* Kaila is unknown.

1. Neck tuft white (figure 1 in Parenti [1992]) ..... 2  
 — Neck tuft grey ..... 3
2. A wide bowl-shaped antrum present; colliculum with short distinctive sclerotisation (figure 4, to the right in Parenti [1992]) ..... *E. adscitella*  
 — No antrum present; colliculum without distinctive sclerotisation (figure 4 to the left in Parenti [1992]) ...  
 ..... *E. revinctella* Zeller
3. Three signa present in corpus bursae .....  
 ..... *E. unifasciella* (Haworth)  
 — Two signa present in corpus bursae ..... 4
4. Signum formed as a pair of sclerotised plates with teeth (Figs. 6, 7, 8, 19, 21, 22) ..... 5  
 — Signum formed as a pair of spine groups (Figs. 28, 37, 38); ostium bursae not sclerotised ..... 8
5. Forewing fascia shiny yellowish (figure 107 in Traugott-Olsen & Nielsen [1977]); signa indistinctly delimited sclerotised plates with a few small blunt teeth (figure 470 in Traugott-Olsen & Nielsen [1977]) .....  
 ..... *E. chrysodesmella* Zeller  
 — Forewing fascia white; signa with well-shaped teeth .  
 ..... 6
6. A funnel-shaped antrum present (figure 471 in Traugott-Olsen & Nielsen [1977]) .....  
 ..... *E. obliquella* Stainton (= *E. megerlella* auct.)  
 — No antrum present ..... 7
7. Head grey; ostium bursae small, its width about 1/4 of distance between apophyses anteriores, narrowly bordered with sclerotised band laterally and anteriorly (Figs. 6, 7) ..... *E. cingillella* (Herrich-Schäffer)  
 — Head creamy white, variably mottled with brownish grey scales especially above; width of ostium bursae nearly half of the distance between apophyses anteriores, broadly bordered with sclerotised band laterally and anteriorly (Figs. 19, 20) .....  
 ..... *E. fasciola* Parenti
8. Signa narrow elongate bands of spines (figure 476 in Traugott-Olsen & Nielsen [1977]) .....  
 ..... *E. gangabella* Zeller  
 — Signa oval-shaped groups of spines ..... 9
9. Fascia of forewing broad, suffused with yellow at outer margin (figure 121 in Traugott-Olsen & Nielsen [1977])



Fig. 1. *Elachista cingillella* (Herrich-Schäffer) ♂ (Sweden, Gotland, Hörsne, I. Svensson leg.).



Fig. 2. *Elachista cingillella* (Herrich-Schäffer) ♀ (Sweden, Gotland, Buttle, I. Svensson leg.).

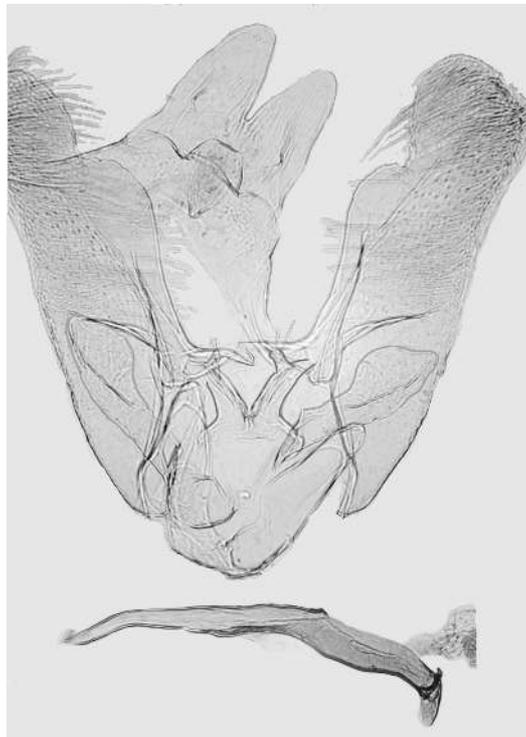


Fig. 3. *Elachista cingillella* (Herrich-Schäffer), ♂ genitalia (lectotype) (Austria: Laaerwald nr. Wien).

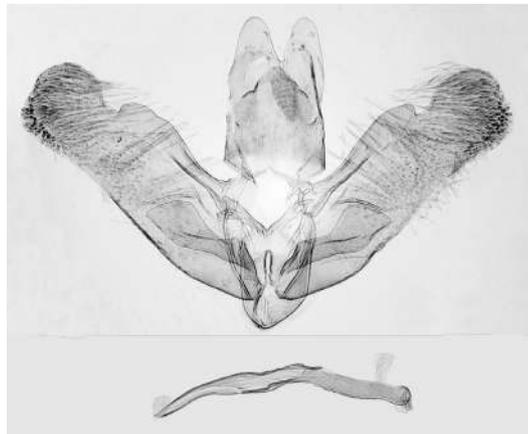


Fig. 4. *Elachista cingillella* (Herrich-Schäffer), ♂ genitalia (Finland: Ta: Pälkäne, J. Junnilainen leg., L. Kaila prep. nr. 3112).

- ..... *E. bisulcella* (Duponchel)
- Fascia of forewing white, not distinctively broad (Figs. 24, 30, 32) ..... 10
- 10. Ostium bursae nearly as wide as the distance between apophyses anteriores, forming indistinct shallow cup without reinforcement surrounding it (Fig. 37) .....  
..... *E. metella* Kaila

- Ostium bursae over half the the width of the distance between apophyses anteriores, forming indistinct shallow cup which is posteriorly and laterally somewhat sclerotised (Fig. 28) ..... 11
- 11. Basal third of forewing concolorous grey with distal third (Fig. 24) ..... *E. nedaella* Traugott-Olsen
- Basal third of forewing brownish, distal third dark grey ..... *E. istanella* Nielsen & Traugott-Olsen

**6. Classification**

Terminology of anatomic structures follows Traugott-Olsen & Nielsen (1977) and Kaila (1999).



Fig. 5. *Elachista cingillella* (Herrich-Schäffer), ♂ digitate process and juxta (Finland: *Ta*: Pälkäne, J. Junnilainen leg., L. Kaila prep. nr. 3112).

***Elachista cingillella* (Herrich-Schäffer)**  
(Figs. 1–8)

*Poeciloptilia cingillella* Herrich-Schäffer, 1855: 299, 303  
*Elachista densicornella* Hodgkinson, 1879: 56, **revised synonymy**

*Elachista densicornuella*, misspelling

**Material studied.** Type material: Lectotype ♂ of *E. cingillella* from **Austria**: Laaerwald nr. Wien designated by Bradley (1963): genitalia slide studied, (in Coll. MNHB). Lectotype ♂ of *E. densicornella* labelled: Grange-over-Sands, June, circ.1878 J. B. Hodgkinson; **LECTOTYPE** [rounded with blue margin]; B. M. ♂ Slide No. 8363; **LECTOTYPE** *Elachista densicornella* Hodgk. J. D. Bradley 1962; paralectotype ♀ with the same collecting data (B. M. slide 8179); both in Coll. Bankes (BMNH).

**Other material.** [**England**, no locality given ]; 1 ♂ 7 ♀, with one ♀ dissected (B. M. slide 8995) in Bankes Collection, (BMNH); 1 ♂ Stainton Coll. (B. M. slide 8288) (BMNH). **Finland**: *Ta*: Valkeakoski 679:33 15.VI.1978 1 ♀ E. Saarela leg. (J. Kyrki prep. nr. 1196, signa illustrated by Kyrki (1979)) (ZMUO); *Ta*: Pälkäne 6.VI.1997 3 ♂ 5 ♀ J. Junnilainen leg. (2 ♂ 3 ♀ dissected: L. Kaila prep. nr. 3112, 3121 (♂), 3184, 3186, 3187 (♀) (Coll. Junnilainen, 1 ♂ in Coll. ZMH), *Sa*: Joutseno 13.VI.1997 1 ♀ (L. Kaila prep. nr. 3185) J. Junnilainen leg. & Coll.; *Kb*: Tohmajärvi 690:67 15.VI.2001 1 ♀ A. Kullberg leg. L. Kaila prep. nr. 3306) (Coll. Kullberg). **France**: Pyrenées Or. Amélie-les-Bains, e.l., larva 18.X.1907 on 'broad grass', emg. 6.IV.1908 1 ♂ Walsingham Coll. (B.M. slide 29797) (BMNH). **Sweden**: Gotland,

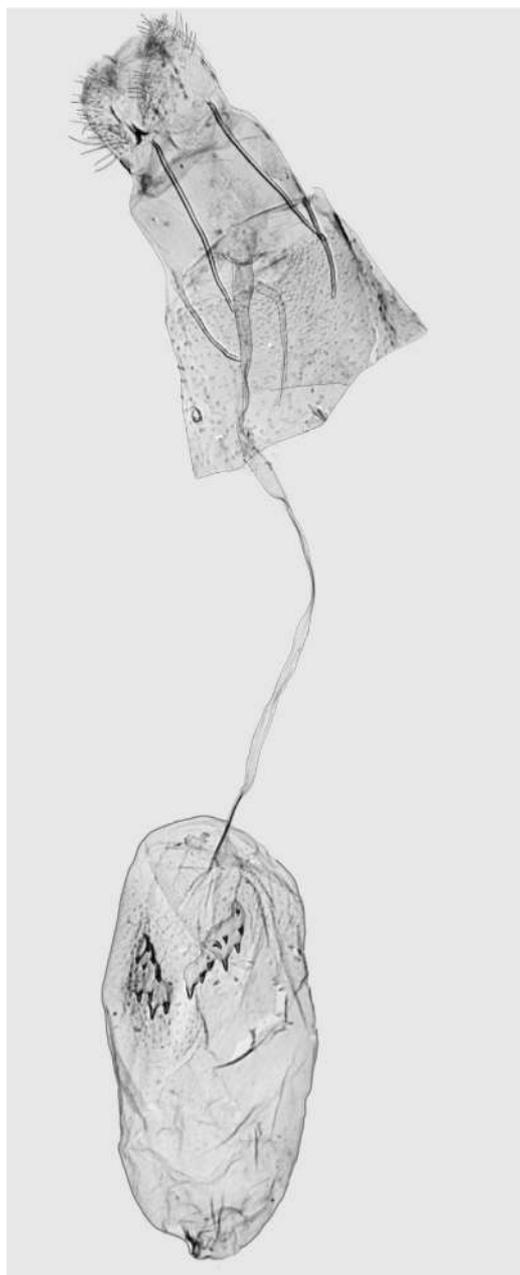


Fig. 6. *Elachista cingillella* (Herrich-Schäffer) ♀ genitalia (Finland: *Ta*: Pälkäne, J. Junnilainen leg., L. Kaila prep. nr. 3187)

Buttle 9.VI.1956 1 ♀ I. Svensson leg. (I. Svensson prep. nr. 3195) (MZLU); Gotland, Hörsne 12.VI.1984 1 ♂ I. Svensson leg. (MZLU); Got-

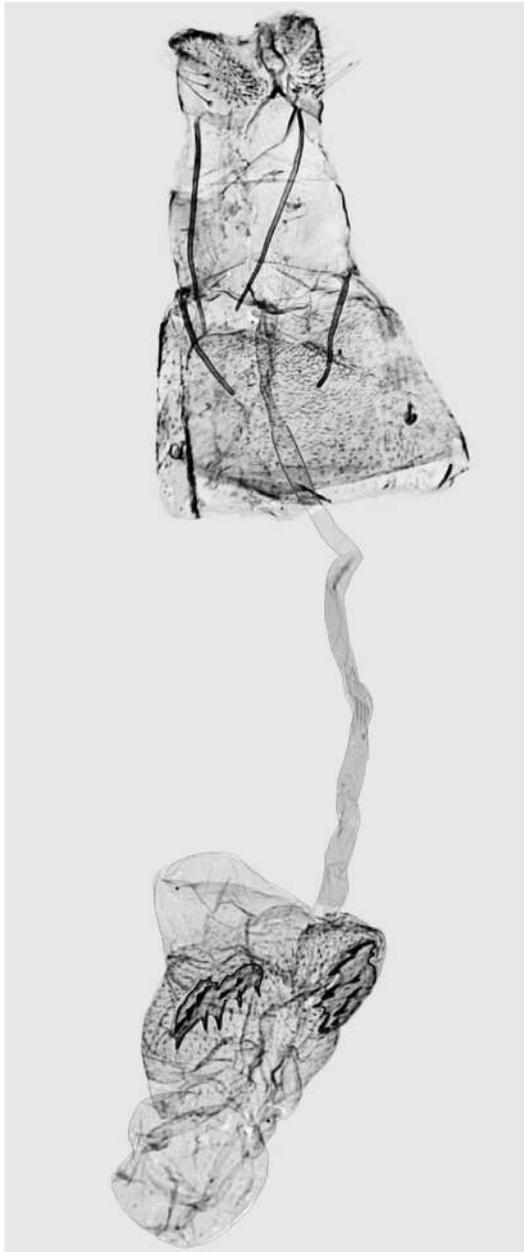


Fig. 7. *Elachista cingillella* (Herrich-Schäffer) ♀ genitalia (Finland: Ta: Joutseno, J. Junnilainen leg., L. Kaila prep. nr. 3185).

land, Ireviken 26.VI.1978 1 ♀ B. Å. Bengtsson leg. (Bengtsson prep. nr. 786) (Coll. Bengtsson); Västra Götaland, Kinnekulle 6.–8.VI.1973 1 ♂ 1 ♀ I. Svensson leg. (I. Svensson prep. nr. 6392 ♂, 4414 ♀) (MZLU); Öland, Böda, Hälludden

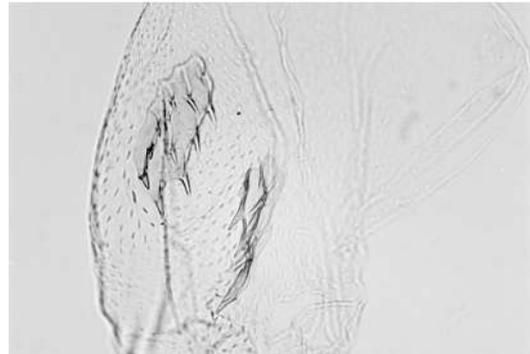


Fig. 8. *Elachista cingillella* (Herrich-Schäffer) ♀ signa (paralectotype of *Elachista densicornella* Hodgkinson) (England: Grange-over-Sands, Hodgkinson leg., B. M. slide 8169).

18.VI.1975 1 ♂ I. Svensson leg. (I. Svensson prep. nr. 5654) (MZLU); Öland, Törnbotten 13.VI.1980 2 ♂ B. Å. Bengtsson leg. (1 ♂ dissected: Bengtsson prep. nr. 1134) (Coll. Bengtsson), 15.VI.1980 1 ♂ B. Å. Bengtsson leg. (L. Kaila prep. nr. 3119) (Coll. Junnilainen). [**Poland?**] Szexard, 1 ♂ Zeller, Coll. Walsingham (B. M. slide 8369) (BMNH). **Russia:** Republic of Karelia, Petrozavodsk 4.VI.1943 1 ♂ V. Karvonen leg. (Schantz prep. nr. 861/1966, genitalia illustrated by Kyrki [1979]); S. Ural: Orenburg distr. Donskoje Village 6 km W Mt. Verbljushka 12.VI.1998 1 ♀ (L. Kaila prep. nr. 3178) T. & K. Nupponen leg. & Coll.

*Diagnosis.* *Elachista cingillella* is a small species which may externally be distinguished from the related species by its grey head. Some of the distinguishing characteristics in the male genitalia, particularly those separating *E. cingillella* from *E. fasciola*, are subtle but they are constant in the material studied. These species can be separated using the genitalia as follows.

*E. cingillella* and *E. fasciola* have distally bilobed juxta lobes (Figs. 5, 14, 16, 18) and signa formed as a pair of dentate plates (Figs. 6–8, 19, 21, 22) thus differing from *E. nedaella* and *E. metella*. The digitate process of *E. sutteri* is club-shaped, distally evenly rounded (Figs. 42, 44) while it is distally oblique and somewhat produced at dorsal margin in all the other species (Figs. 5, 14, 16, 18, 27, 34, 36). The uncus lobes of *E. cingillella* are more rounded than those of *E. fasciola*, the tongue-shaped setose distal lobe in

juxta lobes is smaller than the lateral lobe fused to the valval process (Figs. 3–5). The juxta lobes are more deeply bilobed in *E. fasciola*, its setose long triangular lobe larger than the lateral lobe attached to the valval process (Figs. 14, 16, 18). The distal third of the aedeagus possesses the best tool for separation of these species: it is narrower, gradually tapered to a pointed apex in *E. cingillella* (Figs. 3, 4) as compared to *E. fasciola* in which the apex is broader, more sharply tapered to a more acute apex (Figs. 13, 15, 17). The female signa of *E. cingillella* are formed as a pair of irregularly shaped sclerotised plates with a varying number of sharp arrow-shaped teeth (Figs. 6–8), those of *E. fasciola* as an asymmetric pair of sclerotisations formed of one-six amalgamated rounded plates each with one stout blunt tooth (Figs. 19, 21, 22). The ostium bursae of *E. fasciola* is large, anteriorly and laterally bordered by a broad strongly sclerotised band (Figs. 19, 20), that of *E. cingillella* is smaller and bordered by a much narrower and less sclerotised band (Figs. 6, 7).

*Description.* (Figs. 1–2). Wing span 7.3–8.2 mm (♂), 8.0–8.7 mm (♀). Labial palpus 1.1–1.2 times diameter of head, pale greyish, sometimes with a few grey scales above, below densely mottled with grey tipped scales. Head and neck tuft grey, mottled with darker tipped scales. Scape of antenna dark grey, flagellum dark grey, articles of ♀ annulated with slightly paler rings. Scales of tegula and thorax grey, dark grey tipped. Legs varying from pale to leaden grey, tarsal articles darker grey, tibia and tarsal articles with pale distal rings. Abdomen shiny grey, somewhat paler below. Forewing ground colour consisting of grey, slightly darker grey tipped scales giving a weakly mottled appearance; narrow, straight or medially somewhat outward bent ochreous white transverse fascia at middle of wing, extended from costa to dorsal margin; scales along termen dark grey tipped forming a dark grey fringe line; fringe scales grey except along termen white. Underside of forewing brownish grey, fringe scales concolorous except along termen white. Both upper and underside of hindwing grey with concolorous fringe scales.

*Male genitalia* (Figs. 3–5): Uncus lobes elongate, variably tapered towards more or less pointed apex, setose distolaterally, separated by narrow incision extending to half of length of the uncus.

Gnathos broadest basally or near base, elongate, 2–3 times longer than wide, tapered towards pointed apex. Valva three times longer than wide at its widest point in the middle; costa very convex medially, emarginated at about 3/4 length; sacculus straight joining cucullus without an angle; distal margin of cucullus straight, directed at a right angle to sacculus, somewhat bent towards costa. Digitate process setose at distal third, very large extending to 2/5 length of valva, distal half expanded, distal margin oblique, slightly convex; ventral surface of digitate process with longitudinal ridge from base to costal apex. Juxta lobes nearly cylindrical, distolaterally somewhat produced, distal margin mesially with narrow, apically setose tongue-shaped lobe. Vinculum small, broad. Aedeagus 0.75–0.85 times the length of valva, slightly bent at basal 2/5 and more distinctly bent at distal 4/5, otherwise parallel-sided but distal 1/4 distinctly narrower than other parts; caecum short, rounded, with paired manica; basal opening of aedeagus extended to 1/3 length of aedeagus, distal opening extended from distal 2/3 to apex of aedeagus as narrow bent lateral incision; distal 1/4 gradually tapered to a pointed apex; no cornuti present.

*Female genitalia* (Figs. 6–8): Papillae anales broad triangular, ventrally joined by Y- or X-shaped sclerotisation. Apophyses posteriores slender, straight, twice longer than the length of tergum 8. Apophyses anteriores half the length of apophyses posteriores. Ostium bursae in anterior margin of tergum 8, deeply incised into the integument between tergum 7 and 8, small, width 1/4 of the distance between apophyses anteriores, rounded, dorsal wall broadly spinose, anteriorly and laterally bordered by narrow sclerotised ring; no antrum present; colliculum weakly sclerotised, length 1/4 of the length of apophyses anteriores; ductus bursae narrow, tubular, membranous, three times the length of apophyses posteriores, abruptly inserted to corpus bursae; corpus bursae medially covered by internal spines, signum formed from a pair of elongate irregular-shaped somewhat asymmetric pair of sclerotised plates with 1–15 sharp arrow-shaped teeth.

*Biology.* The only record of the host plant of *E. cingillella* is that given by Hering (1891) who mentions *Milium effusum* L. as the host plant. However, the record has not been verified from

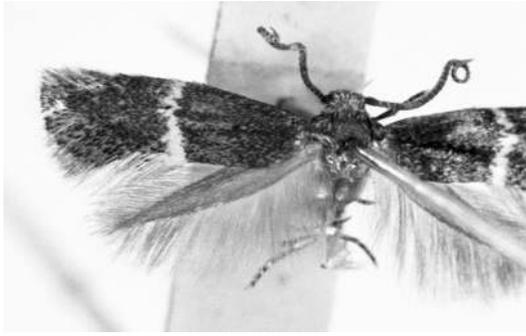


Fig. 9. *Elachista fasciola* Parenti ♂ paratype (Japan, Honshu, Nagano Pref., H. Kuroko leg.).



Fig. 10. *Elachista fasciola* Parenti ♀ paratype (Japan, Honshu, Nagano Pref., H. Kuroko leg.).



Fig. 11. *Elachista fasciola* Parenti ♂ (Slovakia, Komárno, Pastoralis leg.).



Fig. 12. *Elachista fasciola* Parenti (Slovakia, Komárno, Pastoralis leg.).

voucher material and thus it must be considered uncertain. Adult moths have been captured by net during the evening between 18–20 hours (summertime) well before sunset and, occasionally, using artificial light during the night in Finland. Typical habitats seem to be lush forests and small openings within the forests. All adult specimens studied have been collected during June, most of them in early June.

*Verified distribution.* Austria, Finland, France, Great Britain (England), Russia (Republic of Karelia and S. Ural), Sweden.

*Remarks.* Traugott-Olsen & Nielsen (1977) illustrate male genitalia of *E. metella* as those of *E. cingillella*. The habitus illustration of *E. cingillella* ♂ is also painted from *E. metella*. See also Remarks under *E. fasciola*.

#### *Elachista fasciola* Parenti (Figs. 9–22)

*Elachista fasciola* Parenti, 1983: 6

*Material studied.* Type material: 3 ♂ and 3 ♀ paratypes: **Japan:** Honshu, Nagano Pref. Yatsugatake nojo Chino-shi 3.II.1966 1 ♂ H. Kuroko leg. (U. Parenti prep. nr. 3804); Nagano Pref., Nobeyama emg. 10.V.1964 1 ♂ (U. Parenti prep. nr. 3803), emg. 18.V.1964 1 ♀ (U. Parenti prep. nr. 5821), emg. 21.V.1964 1 ♀ (U. Parenti prep. nr. 5846), emg. 8.VI.1964 1 ♀ H. Kuroko leg. (U. Parenti prep. nr. 5818); Kyushu, Fukuoka Pref., Mt. Hiko-san, 10.V.1956 1 ♂ H. Kuroko leg. (U. Parenti prep. nr. 3782) (all in OPU).

*Other material.* **Latvia:** Gaujiena, 9.VI.1981 1 ♂ A. Šulcs leg. (L. Kaila prep. nr. 1044) (Coll. Junnilainen). **Poland:** Bialowieza 28.V.2000 1 ♀

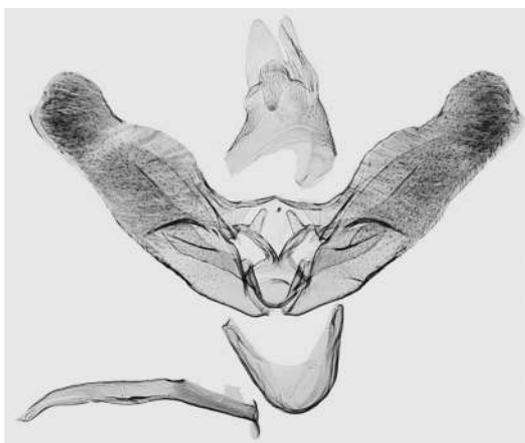


Fig. 13. *Elachista fasciola* Parenti ♂ genitalia (paratype) (Japan, Honshu, Nagano Pref., H. Kuroko leg., U. Parenti prep. nr. 3782).



Fig. 14. *Elachista fasciola* Parenti ♂ digitate process and juxta (paratype) (Japan, Honshu, Nagano Pref., H. Kuroko leg., U. Parenti prep. nr. 3782).

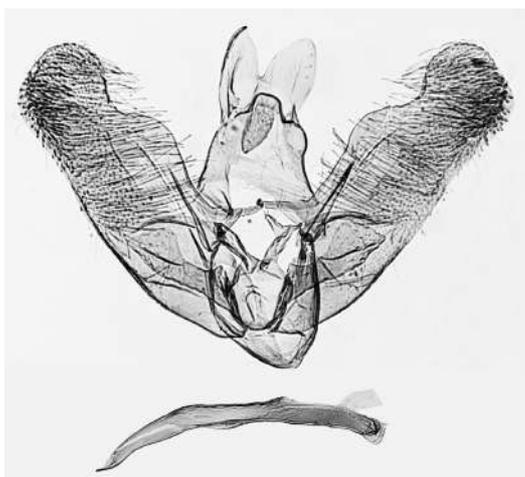


Fig. 15. *Elachista fasciola* Parenti ♂ genitalia (Slovakia, Ostrov Kopac, Z. Tokár leg., L. Kaila prep. nr. 3066).

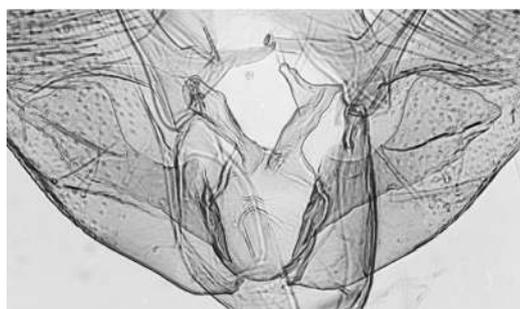


Fig. 16. *Elachista fasciola* Parenti *Elachista fasciola* Parenti ♂ digitate process and juxta (Slovakia, Ostrov Kopac, Z. Tokár leg., L. Kaila prep. nr. 3066).



Fig. 17. *Elachista fasciola* Parenti ♂ genitalia (Poland, Bialowieza, J. Junnilainen leg., L. Kaila prep. nr. 3134).

B. Å. Bengtsson leg. (Bengtsson prep. nr. 4398) (Coll. Bengtsson), 4 km W Bialowieza village 28.V.2000 1 ♂ (Bengtsson prep. nr. 4336), 30.V.2000 1 ♂ 1 ♀ B. Å. Bengtsson leg. (Coll. Bengtsson); Bialowieza 28.V.–1.VI.2000 3 ♂ 3 ♀ J. Junnilainen leg. & Coll. (L. Kaila prep. nr. 3120 ♂, 3134 ♂, 3182 ♀) (1 ♂ in ZMH). **Russia:** S.-Ural: Cheliabinsk distr. Arkaim reserve nr. Amurskii village 18.VI.1996 2 ♂ K. Nupponen,

J.-P. Kaitila, J. Junnilainen & M. Ahola leg.; Iremel mountain reserve, 800 m, 25.VI.1999 1 ♂ T. & K. Nupponen leg. (L. Kaila prep. nr. 3367);

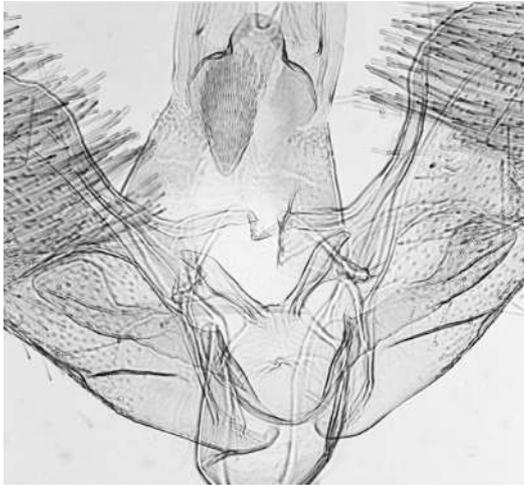


Fig. 18. *Elachista fasciola* Parenti *Elachista fasciola* Parenti ♂ gnathos, digitate process and juxta (Poland, Bialowieza, J. Junnilainen leg., L. Kaila prep. nr. 3134).

Miass, Ilmen State Res. 26.VI.1997 1 ♂, 27.VI.1997 1 ♂ K. Nupponen & J. Junnilainen leg. (L. Kaila prep. nr. 3113); Cheliabinsk distr. 20 km N. Miass, Miasovo leg. 28.VI.1997 1 ♂ K. Nupponen & J. Junnilainen leg. (L. Kaila prep. nr. 3136 ♂); Cheliabinsk distr. near Moskovo village 18.VI.1998 1 ♂ T. & K. Nupponen leg.; Orenburg distr. Donskoje Village 6 km W Mt. Verbljushka 30.V.–5.VI.1998 1 ♀ J. Junnilainen leg., 31.V.1998 3 ♂ 1 ♀ (L. Kaila prep. nr. 3177 ♀), 2.VI.1998 4 ♂ 4 ♀ (L. Kaila prep. nr. 3179 ♀, 3181 ♀), 16.VII.1998 8 ♂ T. & K. Nupponen leg. (L. Kaila prep. nr. 3174, 3175), 10.–12.VI.1998 1 ♂ 2 ♀ J. Junnilainen leg., 12.V.1999 1 ♂ K. Nupponen leg.; Orenburg distr. 12 km S. Kuvandyk 19.VII.1998 1 ♂ K. Nupponen leg. (L. Kaila prep. nr. 3180) (in personal collections of J. Junnilainen and T. & K. Nupponen, 1 ♂ 2 ♀ in ZMH). **Slovakia:** Ostrov Kopac 9.V.1992 1 ♂ Z. Tokár leg. (L. Kaila prep. nr. 3066) (ZMUC); Komárno 2.V.1990 1 ♂ 1 ♀ Pastorális leg. (L. Kaila prep. nr. 3274 ♂, 3279 ♀) (ZMH).

*Diagnosis.* *Elachista fasciola* can be separated from the other species as explained in the key and the diagnosis of *E. cingillella* above.

*Description* (Figs. 9–12). Wing span 7.6–9.4 mm (♂), 8.3–9.7 mm (♀). Labial palpus 1.1–1.2 times diameter of head, pale greyish, sometimes with a few grey scales above, below densely mottled with grey tipped scales. Head and neck tuft pale ochre-



Fig. 19. *Elachista fasciola* Parenti ♀ genitalia (Russia. S. Ural, Orenburg distr., T. & K. Nupponen leg., L. Kaila prep. nr. 3181).

ous, sometimes mottled with brownish grey tipped scales especially above. Scape of antenna dark grey, flagellum unicolorous dark grey in ♂, articles of ♀ annulated with paler rings. Scales of tegula and thorax grey, dark grey tipped. Legs varying from pale ochreous to leaden grey, tarsal

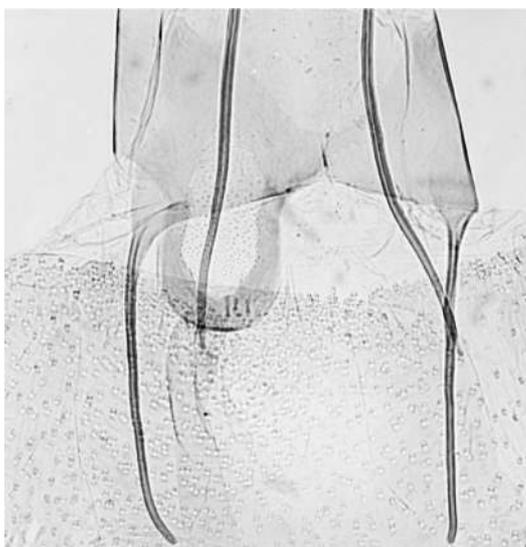


Fig. 20. *Elachista fasciola* Parenti ♀ ostium bursae (paratype) (Japan, Honshu, Nagano Pref., H. Kuroko leg., U. Parenti prep. nr. 5818).



Fig. 21. *Elachista fasciola* Parenti ♀ signa (paratype) (Japan, Honshu, Nagano Pref., H. Kuroko leg., U. Parenti prep. nr. 5818).

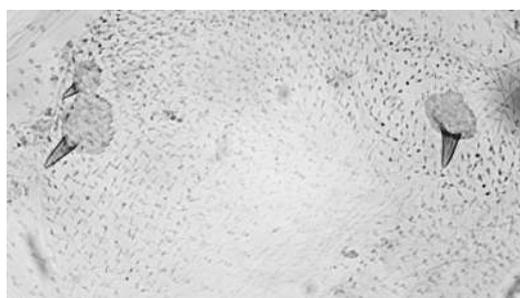


Fig. 22. *Elachista fasciola* Parenti ♀ signa (paratype) (Japan, Honshu, Nagano Pref., H. Kuroko leg., U. Parenti prep. nr. 5821).

articles darker grey, tibia and tarsal articles with pale distal rings. Abdomen shiny grey, somewhat paler below. Forewing ground colour consisting of grey, slightly darker tipped scales giving a weakly mottled appearance; narrow, straight or medially somewhat outward bent ochreous white transverse fascia at middle of wing, extended from costa to dorsal margin; scales along termen dark grey tipped forming a dark grey fringe line; fringe scales grey except along termen white. Underside of forewing brownish grey, fringe scales concolorous except along termen white. Both upper and underside of hindwing grey with concolorous fringe scales.

*Male genitalia* (Figs. 13–18): Uncus lobes gradually somewhat tapered towards rounded apex, setose distolaterally, separated by narrow incision extending to half of length of the uncus. Gnathos broad basally, mesial knob not spinose basally; spinose area about 1.5 times longer than wide, tapered towards rounded apex. Valva three times longer than wide at its widest point in the middle; costa very convex medially, deeply emarginated at about 3/4 length; sacculus somewhat concave at distal 3/4, otherwise straight joining cucullus without an angle; distal margin of cucullus straight, directed at a right angle to sacculus, somewhat bent towards costa. Digitate proc-

ess setose at distal third, extended to 1/3 length of valva, distal half variably somewhat expanded, distal margin oblique, slightly convex; ventral surface of digitate process with longitudinal ridge from base to costal apex. Juxta lobes nearly cylindrical, distolaterally somewhat produced, distal margin deeply bilobed, mesially with long triangular, apically setose lobe. Vinculum small, broad. Aedeagus 0.75–0.85 times the length of valva, evenly somewhat bent, otherwise parallel-sided but distal 1/3 gradually tapered towards apex; caecum short, rounded, with paired manica; basal opening of aedeagus extended to 1/3 length of aedeagus, distal opening extended from distal 3/4 to apex of aedeagus as narrow bent lateral incision; aedeagus distally prolonged as pointed, narrow triangular apex; no cornuti present.

*Female genitalia* (Figs. 19–22): Papillae anales broad triangular, ventrally joined by Y- or X-shaped sclerotisation. Apophyses posteriores slender, straight, about 1.5 times longer than the

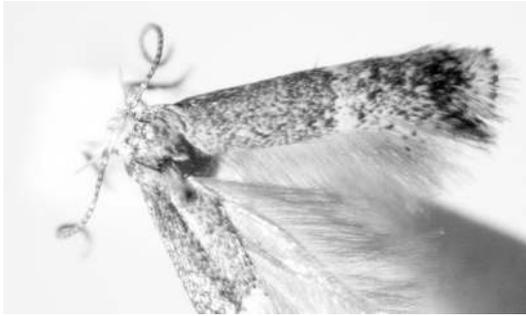


Fig. 23. *Elachista nedaella* Traugott-Olsen ♂ (holotype, Greece, Crete Mt. Ida, Astiraki G. Baldizzone leg.).



Fig. 24. *Elachista nedaella* Traugott-Olsen ♀ (Greece, Crete, 5 km S. Topolia, M. Fibiger, P. Svendsen, D. Nilsson & A. Madsen leg.).

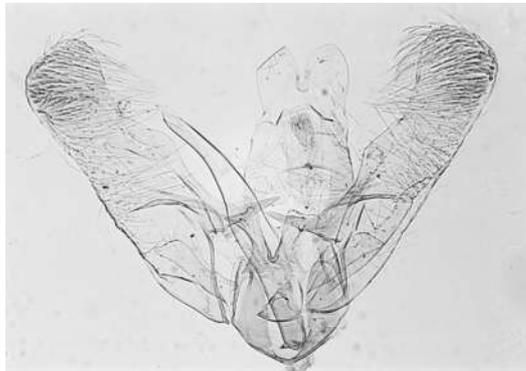


Fig. 25. *Elachista nedaella* Traugott-Olsen ♂ genitalia (holotype, Greece, Crete Mt. Ida, Astiraki, 500 m, 23.VII.1984 G. Baldizzone leg. E. Traugott-Olsen prep. nr. 5858).

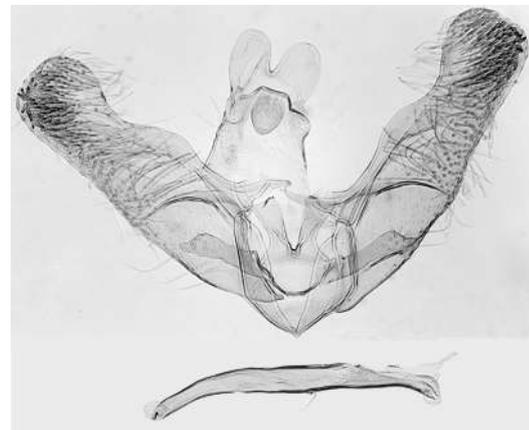


Fig. 26. *Elachista nedaella* Traugott-Olsen ♂ genitalia (Greece, Crete, 4 km S. Topolia, M. Fibiger, P. Svendsen, D. Nilsson & A. Madsen leg., L. Kaila prep. nr. 3256).

length of tergum 8. Apophyses anteriores variable, usually almost as long as apophyses posteriores. Ostium bursae in anterior margin of tergum 8, deeply incised into the integument between tergum 7 and 8, width about half of the distance between apophyses anteriores, rounded, dorsal wall broadly spinose, anteriorly and laterally bordered by broad strongly sclerotised ring; no antrum present; colliculum weakly sclerotised and short, length 1/5 of the length of apophyses anteriores; ductus bursae tubular, membranous, 2.5 times the length of apophyses posteriores, abruptly inserted to corpus bursae; corpus bursae medially covered by internal spines, signum formed from a pair of elongate irregular-shaped asymmetric pair of sclerotised plates consisting of 1–6 stout blunt teeth and their fused basal plates.

*Biology.* Parenti (1983) reports *Acnaterum pekinense* (Hance) Ohwi and *Calamagrostis arundinacea* (L.) Roth. var. *brachytricha* (Steud.) Hack. (Poaceae) as hostplants of *E. fasciola* in Japan. It inhabits shaded deciduous or mixed forests.

*Verified distribution.* Japan, Latvia, Poland, Russia, Slovakia. Parenti (1996) reports it also from Italy.

*Remarks.* *Elachista fasciola* Parenti is very close to *E. cingillella* (Herrich-Schäffer). Based on the material available to us we consider them both valid species. It should be noted that the specimens selected to Figs. 13, 15 and 17 for male genitalia, and to Figs 19, 21 and 22 for female genitalia represent the range of variation observed in



Fig. 27. *Elachista nedaella* Traugott-Olsen ♂ digitate process and juxta (Greece, Crete, 4 km S. Topolia, M. Fibiger, P. Svendsen, D. Nilsson & A. Madsen leg., L. Kaila prep. nr. 3256).

the species. No geographical trends has been observed in this morphological variation, but instead, population from Japan, Urals and eastern Europe each display similar range of variation. Despite the intraspecific variation in several features in both *E. fasciola* and *E. cingillella*, some characteristics seem constantly different between the species. Notably the shape of apex of the aedeagus in the male, size of the ostium bursae, the width of the sclerotised reinforcement around it, as well as the shape of teeth in the signa in the female characterise these species. Other characters such as the colour of the head, the shape of the uncus lobes, gnathos, juxta lobe and the size of the digitate process in the male seem to usually give good diagnostic characteristics, but in some individuals some of these features may overlap. Therefore they should be used cautiously in identification of these species.

***Elachista nedaella* Traugott-Olsen (Figs. 23–28)**

*Elachista nedaella* Traugott-Olsen, 1985: 170

**Material studied.** Type material: holotype ♂: **Greece:** Crete, Mt. Ida, Astiraki, 500 m, 23.VII.1984 G. Baldizzone leg. (*E. Traugott-Olsen* prep. nr. 5858) (ZMUC).

**Other material.** **Greece:** Crete, 5 km S. Topolia, 300 m, 25.–26.VI.2000 1 ♀ (L. Kaila prep. nr. 3255), 4 km S. Topolia, 300 m, 25.–29.VI.2000 2 ♂ (L. Kaila prep. nr. 3256, 3257), Crete, Argiroupoli, 200 m, 15 km SW Rethymnon 25.–29.VI.2000 1 ♂, all M. Fibiger, P. Svendsen, D. Nilsson & A. Madsen leg. (ZMUC, one of those from 4 km S Topolia in ZMH).

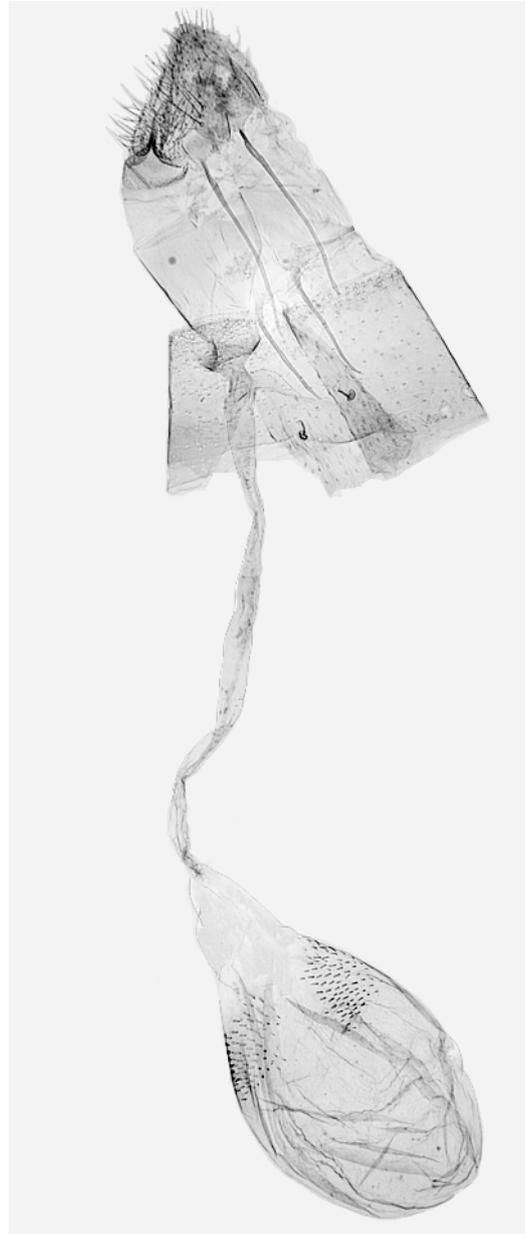


Fig. 28. *Elachista nedaella* Traugott-Olsen ♀ genitalia (Greece, Crete, 5 km S. Topolia, M. Fibiger, P. Svendsen, D. Nilsson & A. Madsen leg., L. Kaila prep. nr. 3255).

**Diagnosis.** *Elachista nedaella* can be separated from the other species as explained in the key. See also the diagnosis of *E. metella* below.

**Description** (Figs. 23, 24). Wing span 6.2–6.6 mm (♂), 5.8 mm (♀). Labial palpus 1.1–

1.2 times diameter of head, ochreous white above, below densely mottled with grey tipped scales. Head and neck tuft ochreous white, with some grey tipped scales above. Scape of antenna dark grey, flagellum dark grey, articles of ♂ annulated with slightly paler, those of ♀ distinctly paler rings. Scales of tegula and thorax grey, dark grey tipped apex of tegula and metascutum pale bluish grey. Legs pale, tarsal articles darker grey, tibia and tarsal articles with pale distal rings. Abdomen shiny grey, somewhat paler below. Forewing ground colour consisting of basally pale bluish grey, dark grey tipped scales giving a strongly mottled appearance; narrow, straight or medially somewhat outward bent ochreous white transverse fascia at middle of wing, extended from costa to dorsal margin; scales along termen dark grey tipped forming a dark grey fringe line; fringe scales grey except along termen white. Underside of forewing brownish grey, fringe scales concolorous except along termen white. Both upper and underside of hindwing grey with concolorous fringe scales.

*Male genitalia* (Figs. 25–27): Uncus lobes rounded, setose distolaterally, separated by narrow incision extending to half the length of the uncus. Gnathos broad, 1.5 times longer than wide, distally tapered towards blunt or rounded apex. Valva 3.5 times longer than wide at its widest point in the middle; costa convex medially, concave at about 3/4 length; sacculus almost straight joining cucullus without an angle; distal margin of cucullus straight, directed at a right angle to sacculus, somewhat bent towards costa. Digitate process nearly parallel-sided, hardly dilated distally, setose at distal third, distal margin oblique, straight or slightly concave, tapered towards prolonged dorsal margin. Juxta lobes narrowest at basal third, distolaterally produced, median margin joining distal margin without angle, distal margin slightly concave, mesially with low setose swelling. Vinculum small, broad. Aedeagus 0.85–0.9 times the length of valva, slightly bent at 1/6 and 4/5 length, otherwise straight, broades medially; caecum blunt, distinctive with paired manica; basal opening of aedeagus extended to 1/4 length of aedeagus, distal opening extended from distal 2/3 to apex of aedeagus as wide lateral incision; apex triangular; no cornuti present.

*Female genitalia* (Fig. 28): Papillae anales broad triangular, ventrally joined by Y- or X-

shaped sclerotisation. Apophyses posteriores slender, straight, 1.5 times longer than length of tergum 8. Apophyses anteriores half the length of apophyses posteriores. Ostium bursae over half the width of the distance between apophyses anteriores, posteriorly and laterally somewhat sclerotised forming indistinct shallow cup, dorsal wall covered with minute spinules; no antrum present; colliculum weakly sclerotised, length 1/3 of the length of apophyses anteriores; ductus bursae tubular, membranous, 2.5 times the length of apophyses posteriores; corpus bursae oval without internal spine coverage except for signum which is formed from a pair of broad groups of coarse spines consisting of about 60 spines each.

*Biology.* Immature stages and host plant unknown.

*Verified distribution.* Greece (Crete).

#### *Elachista metella* Kaila sp. n. (Figs. 30–38)

*Type material.* Holotype ♂: **Croatia**, Krk, Punat 10 m, 22.–26.VII.1984 K. Schnack leg., L. Kaila prep. nr. 3042 (ZMUC). Paratypes (35 ♂ 18 ♀): 8 ♂ 4 ♀ with the same data as in the holotype (2 ♂ 2 ♀ dissected: L. Kaila prep. nr. 3260–3263 (ZMUC, 1 ♂ 1 ♀ in ZMH); **Croatia**: Krk Island, Draga Baska 30.VII.1986 3 ♂ 2 ♀ G. Baldizzone leg. (with the identification label '*Elachista nedaella*, det. E. Traugott-Olsen') (2 ♂ dissected: B. M. slides 29793 and 29817, 1 ♀ dissected: B. M. slide 29794) (Coll. BMNH); Krk Island, Risika 0–50 m, 25.–29.VI.2000 1 ♂ J. Liška leg. (ZMH); **Croatia**: Velebit, 17 km E Karlobag 26.VI.1983 1 ♂ 1 ♀ B. Å. Bengtsson leg. (L. Kaila prep. nr. 3253 ♂, 3259 ♀) (Coll. Bengtsson); Rijeka-Susak [formerly Italy: Fiume], 1 ♂ (B. M. 8356) Mann leg., Coll. Frey (BMNH), same locality, 4 ♂ "11/51", 4 ♂ "9/54" (1 ♂ dissected, B. M. 29790) Mann leg. Coll. Stainton (BMNH). **Italy**: Albenga-Salea 8.VII.1996 1 ♂ J. Liška leg. (ZMH); North Italy, Internepo (Ud) 10.–27.V.1968 4 ♂ J. Klimesch leg. (I. Svensson prep. nr. 4652 ♂) (Coll. Svensson, MZLU); Liguria, Andora-Conna, 300 m, 28.IX.1969 1 ♂ E. Jäckh leg. (I. Svensson prep. nr. 5296) (Coll. Svensson, MZLU); L. da Garda, Pai, 100 m, 27.V.–3.VI.1962 2 ♂ (one dissected; L. Kaila prep. nr. 3269) K. Burmann leg. (TLMF); L. da Garda, Mte.



Fig. 29. *Elachista metella* Kaila sp. n. ♂ (holotype, Croatia, Krk, Punat K. Schnack leg.).

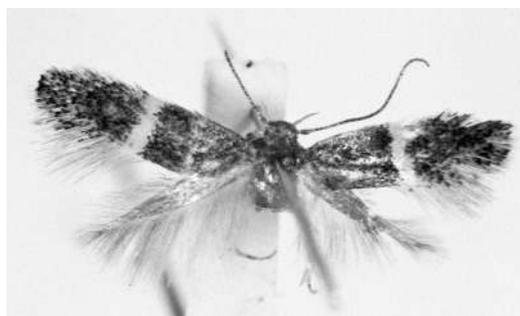


Fig. 30. *Elachista metella* Kaila sp. n. ♀ (paratype, Croatia, Krk, Punat K. Schnack leg.).

Maderno 250 m, M.9.1963 2 ♀ K. Burmann leg. (TLMF). **San Marino:** San Marino 7.VI.1981 9 ♂ 9 ♀ P. Grotenfelt leg. (5 ♂ 2 ♀ dissected; L. Kaila prep. nr. 3541–3545, 3555, 3556) (Coll. Grotenfelt & ZMH).

*Other material.* **Austria:** Nieder-Österreich, Braunsberg, 330 m, E.5.1972 1 ♂ Zuernbauer leg. (L. Kaila prep. nr. 3271) (TLMF); Nieder-Österreich, Hainberger-Bg. 170 m, E.5.1972 1 ♀ Zuernbauer leg. (TLMF). **Bulgaria:** Pirin Mts. Banderica, 1950 m, 26.–30.VII.1996 1 ♂ 1 ♀ J. Liška leg. (L. Kaila prep. nr. 3278) (ZMH). **Croatia:** [no locality given] 3 ♂ Mann leg. Coll. Stainton (BMNH); ‘Croat. Mai’ 4 ♂ 1 ♀ Zeller, Coll. Walsingham (1 ♂ dissected, B. M. slide 29792, 1 ♀ dissected: B. M. slide 29795) (BMNH). **Czech Republic:** S. Moravia 5 km N. Mikulov, Palava Mts. 2.IX.1994 1 ♀ A. Aalto, L. Kaila & K. Mikkola leg. (L. Kaila prep. nr. 3259) (ZMH); 5.–6.IX.1994 1 ♂ J. Junnilainen leg. & Coll. (L. Kaila prep. nr. 3118). **France:** Alpes-Maritimes, 4 km SW St. Vallier de Thiey, 690 m, 14.VIII.1996 P. Skou leg. (L. Kaila prep. nr. 3045) (ZMUC); Alpes-Maritimes, Mt. Agel, 3000 ft. 23.V.1911 1 ♂, B. M. slide 28601, 31.V.1911 1 ♀, B. M. slide 28600 Walsingham leg. (both Wlsm 1911–479) (BMNH); Alpes-Maritimes, Peira Cava 4800 ft 22.VIII.1911 1 ♂ Walsingham leg. (B. M. slide 29799); Basses Alpes, Annot 2300 ft. 24.VIII.1913 1 ♂ (B. M. slide 29802), 19.VIII.1913 1 ♀ (B. M. slide 29800) Walsingham leg. (BMNH); Cannes: 12.IV.1892 10 ♂ (Wlsm. 81130–36, 81137–40, 1 ♂ dissected, B. M. slide 29791), 15.IV.1881 2 ♂ (Wlsm. 84573–4), 30.IV.1991 1 ♂ (Wlsm. 1140) Coll. Walsingham (BMNH); Gallia mer. La Turbie, 250 m, 30.–V.–2.VI.1959 1 ♂ K.

Burmann leg. L. Kaila prep. nr. 3270 (TLMF). **Hungary:** Balaton Lake, Balatonakali 7.V.2000 1 ♂ 1 ♀ J. Liška leg. (L. Kaila prep. nr. 3276 ♂) (ZMH). **Slovakia:** Bratislava, 9.V.1992 1 ♂ 1 ♀ J. Liška leg. (L. Kaila prep. nr. 3275 ♂) (ZMH). **Slovenia:** Koper, 400 m, ?rni Kal 22.V.1999 1 ♂ 1 ♀ J. Liška leg. (L. Kaila prep. nr. 3277) (ZMH). **Switzerland:** Choally 15.VIII.1931 1 ♀ M. Rehfous leg. (U. Parenti prep. nr. 491); Genève, Vallon de l’Allondon 17.V.1946 1 ♂ [no collector mentioned] (U. Parenti prep. nr. 494); Carrières de Veyrier 23.V.1947 1 ♀ (U. Parenti prep. nr. 489), 27.V.1948 2 ♂ [no collector mentioned] (U. Parenti prep. nr. 7438, 7439); Veyrier 29.V.1930 1 ♂ M. Rehfous leg. (U. Parenti prep. nr. 603); Petit-Salève 3.VI.1949 1 ♂ [no collector mentioned] (U. Parenti prep. nr. 7440); Val de l’Allondon 1.VIII.1931 1 ♀ (U. Parenti prep. nr. 493), 6.VIII.1934 1 ♂ (U. Parenti prep. nr. 7436) M. Rehfous leg.; Perrey Dessou 21.V.1932 1 ♂ M. Rehfous leg. (U. Parenti prep. nr. 7437); in addition, 3 ♂ with illegible labels (U. Parenti prep. nr. 490, 496, 7435) (all in MHNG).

*Diagnosis.* *Elachista metella* varies considerably in size. Its identification from *E. cingillella* and *E. fasciola* are explained in the key and in the diagnosis of *E. cingillella* above. *E. metella* is morphologically closest to *E. nedaella*. The male gnathos is longer and narrower, and the valva is broader with medially very convex and distally distinctly emarginate costa as compared to *E. nedaella*. The ostium bursae of the female is entirely membranous in *E. metella*, bordered with weak sclerotisation in *E. nedaella*.

*Description* (Figs. 29–32). Wing span 6.5–9.1 mm (♂), 6.6–9.1 mm (♀). Labial palpus



Fig. 31. *Elachista metella* Kaila sp. n. ♂ (paratype, Italy, Interneppo, J. Klimesch leg.).

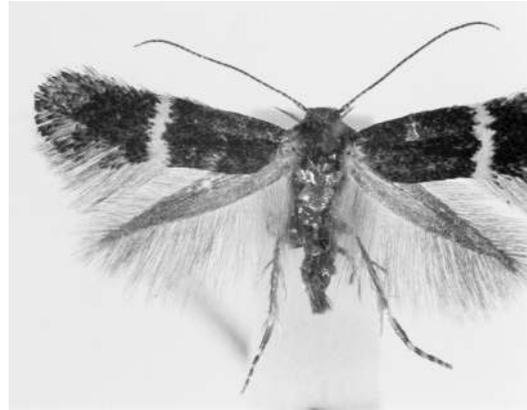


Fig. 32. *Elachista metella* Kaila sp. n. ♀ (Hungary, Balaton Lake, Balatonakali J. Liška leg.).

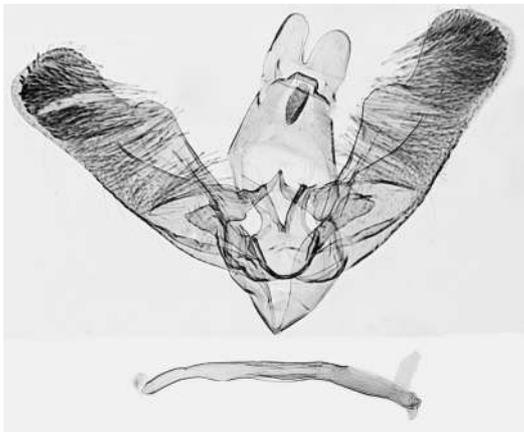


Fig. 33. *Elachista metella* Kaila sp. n. ♂ genitalia (holotype, Croatia, Krk, Punat K. Schnack leg., L. Kaila prep. nr. 3042).

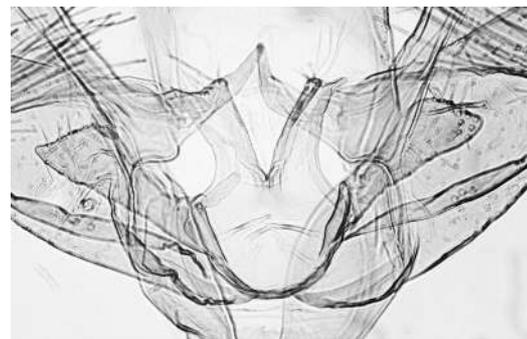


Fig. 34. *Elachista metella* Kaila sp. n. ♂ digitate process and juxta (holotype, Croatia, Krk, Punat K. Schnack leg., L. Kaila prep. nr. 3042).

1.1–1.2 times diameter of head, pale greyish, sometimes with a few grey scales above, below densely mottled with grey tipped scales. Head and neck tuft greyish white, variably mottled with grey tipped scales. Scape of antenna dark grey, flagellum dark grey, articles of ♂ annulated with slightly paler, those of ♀ distinctly paler rings. Scales of tegula and thorax grey, dark grey tipped. Legs varying from pale ochreous to leaden grey, tarsal articles darker grey, tibia and tarsal articles with pale distal rings. Abdomen shiny grey, somewhat paler below. Forewing ground colour consisting of grey, dark grey tipped scales giving a somewhat mottled appearance; narrow, straight or medially somewhat outward bent ochreous white transverse fascia at middle of wing, extended from costa to dorsal margin; scales along

termen dark grey tipped forming a dark grey fringe line; fringe scales grey except along termen white. Underside of forewing brownish grey, fringe scales concolorous except along termen white. Both upper and underside of hindwing grey with concolorous fringe scales.

*Male genitalia* (Figs. 33–36): Uncus lobes rounded, setose distolaterally, separated by narrow incision extending to 1/3 of length of the uncus. Gnathos narrow, 3–4 times longer than wide, tapered towards blunt apex. Valva 3.5 times longer than wide at its widest point in the middle; costa very convex medially, emarginated at about 3/4 length; sacculus almost straight joining cucullus without an angle; distal margin of cucullus straight, directed at a right angle to sacculus, somewhat bent towards costa. Digitate process setose

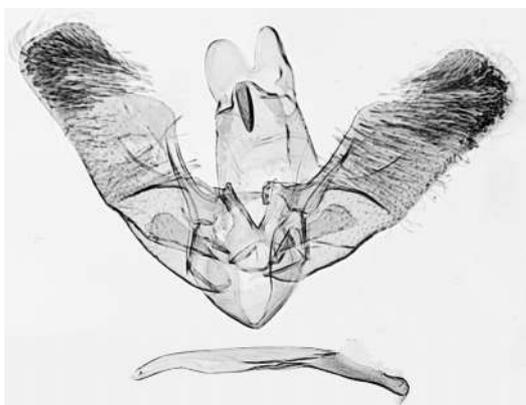


Fig. 35. *Elachista metella* Kaila sp. n. ♂ genitalia (paratype, Croatia, Krk, Punat K. Schnack leg., L. Kaila prep. nr. 3260).

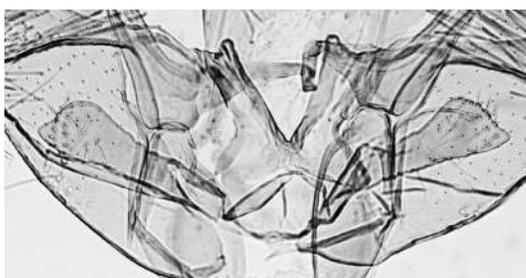


Fig. 36. *Elachista metella* Kaila sp. n. ♂ digitate process and juxta (paratype, Croatia, Krk, Punat K. Schnack leg., L. Kaila prep. nr. 3260).

at distal third, broadest at distal four-fifths, distal margin oblique, slightly concave, tapered to a short prolonged apex at dorsal margin. Juxta lobes parallel-sided, distolaterally produced, distal margin concave, mesially with setose small swelling. Vinculum small, broad. Aedeagus 0.85–0.95 times the length of valva, slightly bent at 1/4 and more distinctly bent at 2/3 length; caecum blunt, distinctive with paired manica; basal opening of aedeagus extended to 1/5 length of aedeagus, distal opening extended from distal 3/4 to apex of aedeagus as narrow lateral incision which is widened at the proximal end and with small triangular lobe near apex; apex rounded; no cornuti present.

*Female genitalia* (Figs. 37, 38): Papillae anales broad triangular, ventrally joined by Y- or X-shaped sclerotisation. Apophyses posteriores slender, straight, nearly twice longer than length of

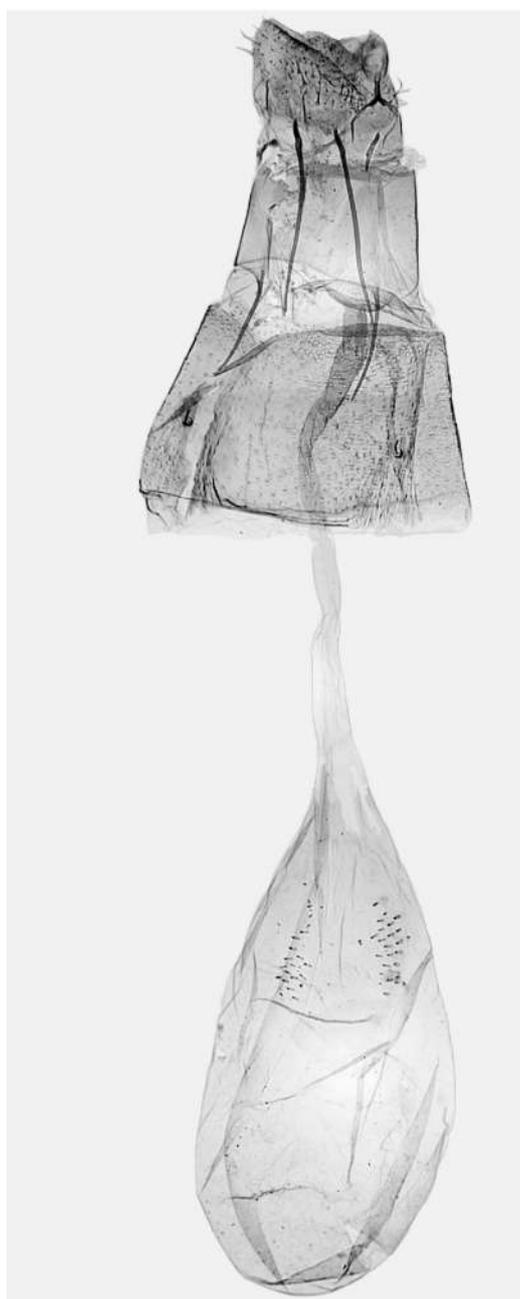


Fig. 37. *Elachista metella* Kaila sp. n. ♀ genitalia (paratype, Croatia, Krk, Punat K. Schnack leg., L. Kaila prep. nr. 3262).

tergum 8. Apophyses anteriores half the length of apophyses posteriores. Ostium bursae nearly as wide as the distance between apophyses anteriores, forming indistinct shallow cup without reinforce-

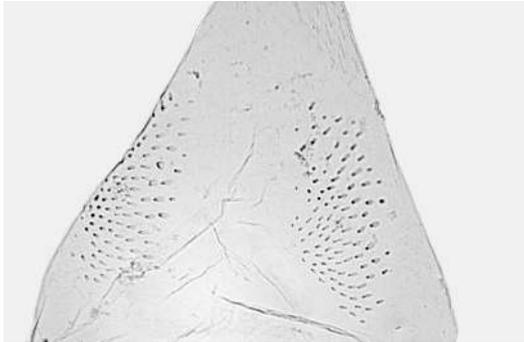


Fig. 38. *Elachista metella* Kaila sp. n. ♀ genitalia (Switzerland, Choally, M. Rehfoos leg., U. Parenti prep. nr. 491).



Fig. 40. *Elachista sutteri* Kaila sp. n. ♂ (paratype, Greece, Kirki nr. Alexandropolis P. Grotenfelt leg.).

ment surrounding it, dorsal wall covered with minute spinules; no antrum present; colliculum weakly sclerotised, length 1/3 of the length of apophyses anteriores; ductus bursae tubular, membranous, 2–2.5 times the length of apophyses posteriores; corpus bursae oval without internal spine coverage except for signum which is formed from a pair of oval-shaped groups of coarse spines consisting of about 20–60 spines each.

**Biology.** Immature stages are unknown. According to the label data, the species has at least two generations per year. Size of the individuals varies a lot, representatives of the autumn brood being often smaller than those flying in early summer. *E. metella* inhabits open or bushy xerothermic habitats.

**Verified distribution.** Austria, Bulgaria, Croatia, Czech Republic, France, Hungary, Italy, San Marino, Slovakia, Slovenia, Switzerland.



Fig. 39. *Elachista sutteri* Kaila sp. n. ♂ (holotype, Greece, Samos, Kokkari, R. Sutter leg.).

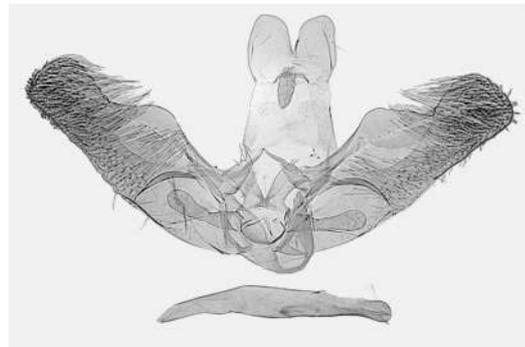


Fig. 41. *Elachista sutteri* Kaila sp. n. ♂ genitalia (holotype, Greece, Samos, Kokkari, R. Sutter leg., R. Sutter prep. nr. 6259).

**Remarks.** The adult illustrations (figures 110 and 111), as well as the wing venation (figure 209) and the male genitalia drawing (figure 355) of *E. cingillella* (H.-S.) in Traugott-Olsen & Nielsen (1977) represent *E. metella*.

#### ***Elachista sutteri* Kaila sp. n. (Figs. 39–44)**

**Type material.** Holotype ♂: **Greece:** I. Samos, Kokkari, 15 m, 13.VI.2000 R. Sutter leg. GU 6259 (ZMH). Paratypes (2 ♂): **Greece:** Kirki nr. Alexandropolis 27.VII.1985 1 ♂ P. Grotenfelt leg. (L. Kaila prep. nr. 3547) (Coll. Grotenfelt); Cyprus, Kakopetria, 800–1000 m, 22.IV.2002 1 ♂ J.-P. Kaitila leg. & Coll. (L. Kaila prep. nr. 3599).

**Diagnosis.** *Elachista sutteri* is a small species externally closely resembling *E. metella* and *E. nedaella*. In the male genitalia it is easily separated from these species by its broader juxta lobes,

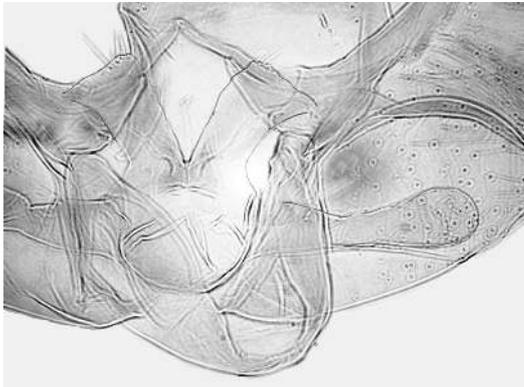


Fig. 42. *Elachista sutteri* Kaila sp. n. ♂ digitate process and juxta (paratype, Greece, Kirki nr. Alexandropolis P. Grotenfelt leg., L. Kaila prep. nr. 3547)



Fig. 43. *Elachista sutteri* Kaila sp. n. ♂ genitalia (paratype, Greece, Kirki nr. Alexandropolis P. Grotenfelt leg., L. Kaila prep. nr. 3547).

the club-shaped, distally evenly rounded digitate process, and its broader aedeagus as compared to the other species.

*Description* (Figs. 39, 40). Wing span 6.7 mm. Labial palpus 1.1 times diameter of head, ochreous white, below mottled with grey tipped scales. Head and neck tuft ochreous white, mottled with a few grey tipped scales. Scape of antenna ochreous white, medially with grey scales above, flagellum grey, articles annulated with paler rings. Scales of tegula and thorax grey, dark grey tipped, tip of tegula and metascutum whitish. Legs pale ochreous, tibia and tarsal articles medially grey above, the grey patch medially divided in mid and hind tibia. Forewing ground colour consisting of grey, dark grey tipped scales giving a mottled appearance; narrow, straight white transverse fascia at middle of wing, extended from costa to dorsal margin; scales along termen dark grey tipped forming a dark grey fringe line; fringe scales grey except along termen white. Underside of forewing brownish grey, fringe scales concolorous except along termen white. Both upper and underside of hindwing grey with concolorous fringe scales.

*Male genitalia* (Figs. 41–44): Uncus lobes broad, rounded, setose distolaterally, separated by narrow incision extending to about 1/3 of length of the uncus. Gnathos twice longer than wide, tapered towards blunt apex. Valva three times longer than wide at its widest point in the middle; costa very convex medially, emarginated at about 3/4 length; sacculus slightly concave at 3/4 length,

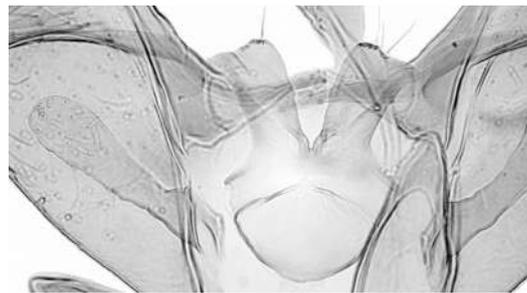


Fig. 44. *Elachista sutteri* Kaila sp. n. ♂ digitate process and juxta (paratype, Greece, Kirki nr. Alexandropolis P. Grotenfelt leg., L. Kaila prep. nr. 3547).

otherwise almost straight joining cucullus without an angle; distal margin of cucullus straight, directed at a right angle to sacculus, somewhat bent towards costa. Digitate process nearly straight, setose at distal third, club-shaped, narrowest at 2/5 length. Juxta lobes parallel-sided, three times longer than wide, distolaterally produced, median margin joining distal margin at a right angle, distal margin setose mesially, straight. Vinculum small, broad. Aedeagus 0.85 times the length of valva, bent at 2/3 length, otherwise straight; medially broadened; caecum blunt, distinctive with paired manica; basal opening of aedeagus extended to 1/4 length of aedeagus, distal opening extended from distal 3/4 to apex of aedeagus as narrow lateral incision; apex triangular; no cornuti present.

*Female genitalia.* Unknown.

*Biology.* Immature stages and host plant unknown. The specimen collected in Cyprus was found flying at dusk in a lush riverside habitat.

*Verified distribution.* Greece: continental Greece, Samos, Cyprus.

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