

A revision of the *Elachista regificella* Sircom -complex (Lepidoptera: Elachistidae)

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The *Elachista regificella* complex (Elachistidae) is revised and considered to consist of three closely related species: *E. regificella* Sircom, presently only recorded from Great Britain, *E. geminatella* (Herrich-Schäffer), stat. rev. (= *E. nieukerkeni* Traugott-Olsen, syn. nov.) and *E. tengstromi* nom. nov. (= *E. magnificella* Tengström, 1848, nec Duponchel, 1843). The latter two species are widely distributed e.g. in Central Europe, the range of *E. tengstromi* extending to Japan. The species are diagnosed and illustrated. Life history records indicate that the species have, at least to some extent, different host plant preferences: *Luzula sylvatica* is recorded as the host plant of *E. regificella* and *E. geminatella*, of which the latter probably exploits other host plants as well. *L. pilosa* is the only known host plant of *E. tengstromi* in Europe, with further host plants recorded in Japan. Neotypes are designated for *Elachista regificella* Sircom and *Poeciloptilia geminatella* Herrich-Schäffer.

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1. Introduction

Elachista regificella Sircom, often also referred to as *E. magnificella* Tengström, has been understood to be a widespread and well-known species in Europe. It has a striking outer appearance with a characteristic pattern of metallic spots on its shiny blackish brown forewings. The mine of the larva is also easy to recognise as being the sole longitudinally folded 'Phyllonorycter-type' mine on *Luzula* species. Perhaps due to the apparent lack of identification problems, the species has not been subject to a closer taxonomic examina-

tion. An exception is the recent description of *E. nieukerkeni* Traugott-Olsen from a specimen collected from Navarredonda de Gredos, Spain (Traugott-Olsen 1995). Although three species names have been introduced to this taxon in the middle of the 19th century, this has certainly happened due to lack of established nomenclatory rules and the difficulty of communication between lepidopterists of those times, rather than the authors' belief of their taxa being distinct from each other.

However, I. Šulcs discovered that the genitalia of a specimen collected by J. Junnilainen in

Latvia seemed to differ from the 'usual' *regificella*. Examination of a long series of specimens later collected from the same locality by him, S. Kerppola and I. Šulcs, revealed that more than one species were involved. Examination of further specimens collected from western, central and northern Europe as well as Kuriles and Japan gave further support to this view.

Here we provide a reassessment of the species complex and suggest that it consists of three species: *E. regificella* Sircom, *E. geminatella* Herrich-Schäffer stat. rev. (= *E. nieukerkeni* Traugott-Olsen, syn. nov.) and *E. tengstromi* nom. nov. (= *E. magnificella* Tengström, (1848), nec Duponchel, 1843). *Elachista regificella* has to our knowledge only been recorded from Great Britain although a wider range is expected. *Elachista geminatella* and *E. tengstromi* are widely distributed in Europe, the range of the latter species extending to 65° latitude in northern Europe and to Japan in the East.

The material was received from the following collections:

- BMNH: The Natural History Museum, London, U.K. (K. R. Tuck).
- MNHB: Museum für Naturkunde, Humboldt-Universität Berlin, Germany (W. Mey).
- NNML: Nationaal Natuurhistorisch Museum, Naturalis, Leiden, The Netherlands (E. J. van Nieukerken).
- NMS: National Museum of Scotland, Edinburgh, Scotland (K. P. Bland).
- SEHU: Laboratory of Systematic Entomology, Faculty of Agriculture, Hokkaido University, Japan (K. Sugisima).
- 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).
- ZSM: Zoologische Staatssammlung, München, Germany (A. Seeger).
- Private collections of L. Aarvik (Oslo, Norway), B. Å. Bengtsson (Färjestaden, Sweden), W. Biesenbaum (Velbert-Langenberg, Germany), J. Junnilainen (Vantaa, Finland), S. Kerppola (Helsinki, Finland), A. & J. Kullberg

(Helsinki & Espoo, Finland), K. Sugisima (Sapporo, Japan), and I. Šulcs (Riga, Latvia).

2. Systematic position and definition of the *Elachista regificella* complex

According to Kaila (1999), the *E. regificella* complex belongs to the basal lineage of the subgenus *Elachista*, together with, e.g., *E. quadripunctella* (Hübner) and *E. gleichenella* (Fabricius) with its allies. Traugott-Olsen (1995) gives a definition of the *Elachista regificella* complex as a part of his *E. gleichenella* group. We agree with this arrangement which is also indirectly supported by Kaila (1999). However, the main diagnostic character separating the *E. regificella* complex from the *E. gleichenella* complex as defined by Traugott-Olsen (1995), i.e. the relative placement of the forewing veins R2 and R3, has been shown to be subject to a considerable individual variation and even asymmetry widely within Elachistidae. Therefore it is of hardly any systematic value and should be rejected in classifications in this family (Albrecht & Kaila 1997). In spite of the rejection of this character, we believe that the *E. regificella* complex is monophyletic based on evidence from the following characters: uncus lobes have setae arising from flat pinaculæ on the ventral side (cf. Fig. 43 in Kaila 1999), a trait not known for other members of the subgenus *Elachista*, with the sole exception of one species complex in the Australian-New Zealand *E. gerasmia* group (L. Kaila unpubl.). The structure of the larval mine is characteristic in the known species of the *E. regificella* group exhibiting longitudinal folds on the epidermis (cf. Steuer 1980, Traugott-Olsen & Nielsen 1977, Bland & Knill-Jones 1988). The uncus lobes in the members of *E. gleichenella* complex are covered by scales arising from erected pinaculæ, as in most members of s.g. *Elachista* (cf. Fig. 43 in Kaila 1999). The wing pattern is also characteristic in the members of the *E. regificella* complex by having a silvery transverse fascia situated near, not at the base of the forewing.

Following this re-definition of the *E. regificella* complex, we suggest that *E. kosteri* Traugott-Olsen is removed from it to the *E. gleichenella* complex. It is to our knowledge presently only

known from male specimens that are hardly distinguishable from *E. differens* Parenti (cf. Traugott-Olsen 1995, Kaila & Biesenbaum 1995). However, we prefer not to establish an uncertain formal synonymy between these taxa in this context.

3. Diagnosis of the *E. regificella* 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 absent. Antenna extended to about 2/3 of the forewing, scape basally with pecten consisting of a few elongate, stiff hair-like scales; flagellum without visible ciliation, distal third in female white. Length of labial palpus 0.7–0.9 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; M2, CuA1 and CuA2 in common stalk. Besides the usual type of scale coverage, the forewing has shiny metallic pattern formed by transparent scales with no longitudinal furrows or distal teeth. Tarsal articles with three spines distally.

Pregenital abdomen. Tergum 8 of male triangular, anteriorly narrowly sclerotised.

Male genitalia. Uncus lobes narrow, tongue-shaped, gradually tapered towards blunt tip, ventral surface sparsely covered with setae arising from flat pinaculae. Socius present as a small group of about 10 small spinules. Basal arms of gnathos not fused medially; lobes of the spinose knob of gnathos entirely fused forming a single, very large elongate subquadrangular knob. 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, distal fold extended to about 3/4 of valva where it becomes invisible; cucullus somewhat oblique, a little truncate. Median plate of juxta concave without median or lateral pockets; juxta lobes widely apart from each other, distinctly sclerotised, ven-

tral surface distally with a row of setae. Elongate tongue-like, setose digitate process between median plate of juxta and ventral surface of valva. Aedeagus not ankylosed, without manica; with one cornutus.

Female genitalia. Papillae anales rounded, membranous. A dense group of long setae in dorsal membrane between papillae anales and tergum 8. Ostium bursae in anterior margin of sternum 8; no distinctive antrum present; ductus seminalis membranous, tubular, incepted to ductus bursae anterior to colliculum; posterior part of ductus bursae dilated and variably sclerotised, anterior part tubular, straight or spirally coiled; corpus bursae varying in shape from nearly rounded to pyriform, with internally directed spiculae; with one elongate, dentate signum.

4. Identity of *E. regificella* Sircom and *E. geminatella* (Herrich-Schäffer)

The oldest name available in the species complex is *Elachista regificella* Sircom, 1849, the type locality of which is Bristol, England. The Sircom collection should be in the Bristol Museum. The collection was, however, destroyed during the Second World War. All attempts to find the collection since have been unsuccessful, and it must be considered lost (K. R. Tuck, BMNH, pers. comm.). Since no original type material of *Elachista regificella* exists to date, the identity of the nominal species had to be inferred indirectly. Using knowledge on the distribution of the species involved, none of the three species could be excluded as a possible candidate of being the original *regificella*, since all three species occur in England. Although the original description of *regificella* is short, it anyway provides a schematic illustration of the wing pattern of the species in question. What is striking in the illustration are the narrow and elongate costal and tornal spots in the forewing. According to our present knowledge on the wing pattern of the three species, the shape of these spots is perhaps the only clue for identification of these species externally. This character agrees best with the taxon illustrated in 'The Moths and Butterflies of Great Britain and Ireland' (Bland in Emmet 1996), i.e. the one regu-



Fig. 1. *Elachista* spp. Top row: *E. regificella* Sircom left ♂, right ♀; middle row: *E. geminatella* (Herrich-Schäffer) left ♂, right ♀; bottom row: *E. tengstromi* nom. nov. left ♂, right ♀ (Painted by BÅB).

larly found to feed on *Luzula sylvatica* in Great Britain. Moreover, since this species seems, according to our knowledge, to be the most common of the three species in England, and indeed the only one from which we have examined authentic specimens collected from Bristol, we consider this taxon most probable as Sircom's original species. In the name of nomenclatoric stability we designate a neotype for *E. regificella* Sircom in this paper.

Elachista geminatella (Herrich-Schäffer, originally named as *Poeciloptilia geminatella*) is another species of which no authentic material has been found, in spite of careful search in the collections of the MNHB by Dr. W. Mey, in ZSM by A. Seegerer, or BMNH by K. R. Tuck and L. Kaila. In continental Europe two species of the complex are now known to widely co-occur. Herrich-Schäffer's (1855) verbal description does not help in decision on which of the two species could have been his *geminatella*. However, the detailed illustration in his colour plate (see fig. 1015, table 123) can serve as a guide. In the female specimen illustrated, the narrow tornal spot of the forewing is striking. We have not seen any specimens of *E. magnificella sensu* Tengström with such a nar-

row tornal spot, but we have come across some female specimens of the other species in which the spot is as narrow as in Herrich-Schäffer's painting. Based on this evidence we suggest that Tengström's *magnificella* (the name here replaced as *E. tengstromi*) does not represent the same species as Herrich-Schäffer's *geminatella*. To obtain nomenclatoric stability we designate a neotype for *Poeciloptilia geminatella* Herrich-Schäffer in this paper.

5. Identification of the species

There appear to be slight differences in the outer appearance among the three species, but due to individual variation considerable overlap exists among them. Thus a safe identification of the species will usually require the study of the genitalia, perhaps except in the most typical specimens, or if life history data is available. All these species possess specific characters in both their male and female genitalia. The best diagnostic characteristics in the male genitalia are in the shape of the aedeagus and the cornutus within it. In the female genitalia, the best diagnostic characters for dis-

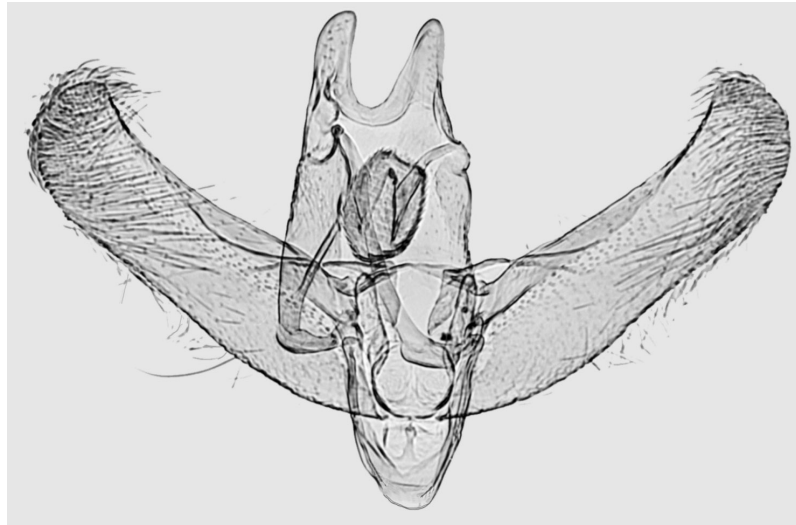


Fig. 2. *Elachista regificella* Sircom. ♂ genitalia, aedeagus excluded (U.K., Wales, Tintern, Monmouthshire, E. C. Pelham-Clinton leg., L. Kaila prep. nr. 2983).

tinguishing the three species are the absolute and relative lengths of the colliculum, the posterior dilation and the tubular anterior part of the ductus bursae. The identification is explained under the diagnoses of the species below.

6. Classification

Elachista regificella Sircom (Figs. 1 (top row), 2–5)

Elachista regificella Sircom, 1849: 42

Material studied. Type material: Neotype ♀, here designated, is labelled: *A. magnificella*, Tgst. Bristol ♀ J. W. Tutt; S. N. A. Jacobs Coll. B. M. 1977-420; B. M. ♀ Genitalia slide No. 29769 (BMNH).

Other material. Great Britain (England): Bristol, 2 ♂ J. W. Tutt leg., Coll. Jacobs (1 ♂ dissected, B. M. 29768) (BMNH); Devon, Bucks Mills, 1 ♂ bred 22.VII.1950, 1 ♂ bred 6.VII.1950, 1 ♀ bred 24.VII.1950 S. Wakely leg., the two latter in the Jacobs Coll. (B. M. slides 28594, 29766 and 29767) (BMNH). **Great Britain (Wales):** Tintern, Monmouthshire, 3 ♂ 3 ♀ e. 1. 26.VI.–7.VII.1965 E. C. Pelham-Clinton leg. (*Luzula sylvatica*) (NMS).

Diagnosis. Wingspan 8.5–9.9 mm. *E. regificella* seems to vary less in size than the other species, the specimens studied being as large as the largest representatives of the other species. It

tends to have narrower costal and tornal spots as compared to the other species, the costal spot being crescent-shaped versus the triangular–square shape of the costal spot in *E. geminatella* and *E. tengstromi*. The valva of *E. regificella* is slightly longer than that of *E. geminatella*: the length of valva – length of aedeagus ratio is on average 1.3 ($n = 6$, min. 1.3, max. 1.4). The width of the cornutus in the male aedeagus is between the other species (Fig. 3). The aedeagus is similar to that of *E. tengstromi* in shape lacking a ventrolateral swelling. The female genitalia are characteristic with the small posterior dilation and the very long and anteriorly spirally coiled ductus bursae (Figs. 4, 5). The length of the dilation, as measured from inception of ductus seminalis to the end of the dilation, is equal to the length of apophyses posteriores in *E. regificella*, and it contains a small group of spines posteriorly, and sometimes also an indistinct sclerotised longitudinal ridge therein. In this species the total length of the ductus bursae (including colliculum) is usually longer than in the other species with, however, some overlap: it is 6.5–7.5 times longer than the length of the apophyses posteriores. The tubular anterior part is, however, longer than in the other species due to the smaller size of the posterior dilation. See also the diagnoses of the other species.

Biology. Bland and Knill-Jones (1988) and Bland (1996) give a detailed account of the biology of this species. It occurs on fairly open foodland where its foodplant *Luzula sylvatica*

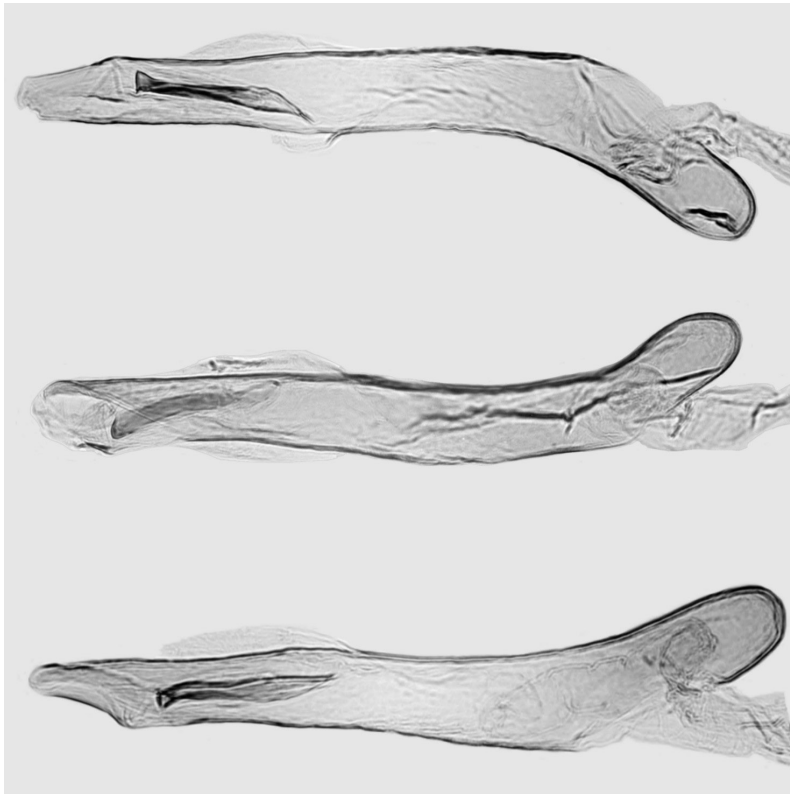


Fig. 3. *Elachista regificella* Sircom. ♂ aedeagus. All from U.K., Wales, Tintern, Monmouthshire, E. C. Pelham-Clinton leg.; top L. Kaila prep. no 2953, center L. Kaila prep. nr. 2983, bottom L. Kaila prep. nr. 2984.

grows on sunny banks. The species is univoltine, occurring in July. The larva hatches in September–October, and is fully fed in mid-May to early June. The larva frequently abandons the mine and forms a new one to another leaf. The records from *Luzula pilosa* probably refer to *E. tengstromi* that is also recorded from England.

Distribution. W. Europe. *E. regificella* has presently only been recorded from Great Britain, but a wider distribution range in Western Europe is expected to be revealed when the species is specifically searched for.

***Elachista geminatella* (Herrich-Schäffer) (Figs. 1 (middle row), 6–10)**

Poeciloptilia geminatella Herrich-Schäffer, 1855: 301, 309, revised status

Elachista magnificella sensu Zeller, 1847: 891, nec Duponchel, 1843

Elachista nieukerkeri Traugott-Olsen, 1995: 366, syn. nov.

Material studied. Type material: Neotype ♀, here designated, labelled: Siebengeb. Drachenfels

(Germany, nr. Bonn); Mine an: *Luzula silvatica* (sic!) Gorrhott 26; 31.V. No. 6688 1961. Hering: Z; L. Kaila Prep. nr. 2973 (all white); NEOTYPE *Poeciloptilia geminatella* Herrich-Schäffer des. L. Kaila 2000 (red) (MNHB).

Other material (with 13 ♂ 14 ♀ genitalia preparations): **Austria:** Austria merid. Kärnten, St. Jakob i. Lesachtal Mussen SE, 1700–1750 m, 24.–25.VII.2000 5 ♂ 1 ♀ Huemer & Erlebach leg. (TLMF). **Belgium:** Mons 6.VII.1939 1 ♀ A. Dufrane leg. (ZSM). **Denmark:** Bornholm, Klemensker 13.VII.1978 1 ♂ O. Karsholt leg. (ZMUC); Karlstrup Strand, 9.VII.1969 1 ♂, 28.VII.1969 1 ♀ E. Traugott-Olsen leg. (ZMUC); Asserbo 17.VII.1963 1 ♂ N. L. Wolff leg., 13.VII.1972 1 ♂ J. Ljungqvist leg. (ZMUC); Sønderjylland, Stensbaek plantage 20.VII.1950 1 ♀ Worm-Hansen leg. (ZMUC). **France:** Alpes-Maritimes, Peira Cava, 4800 ft., 23.VII.1911 1 ♂ Walsingham leg. (Wlsm. 1911-479) (B. M. slide 28596), 1 ♀ with the same collection data (BMNH). **Germany:** Baden-Baden 23.VI.1940 1 ♂ E. Linack leg., Coll. Osthelder (ZSM); Bavaria mer.,



Fig. 4. *Elachista regificella* Sircom. ♀ genitalia, neotype (U. K. England, Bristol, J. W. Tutt leg., B.M. slide 29769).



Fig. 5. *Elachista regificella* Sircom. ♀ genitalia (U.K., Wales, Tintern, Monmouthshire, E. C. Pelham-Clinton leg., L. Kaila prep. nr. 2977).

Gröbenzeller Moor bei München 31.VII.1940 1 ♂
1 ♀ L. Osthelder leg. (ZSM); nr. Bonn, Drachen-
fels, Siebengeb 5.VI.1961 1 ♂ e. 1. *Luzula*
sylvatica Hering leg. (MNHB); Württemberg,

Lindelfingen 2.VIII.19313 2 ♀ A. Wörz leg., Coll.
M. Sälzl (ZSM), 13.VIII.1935 2 ♂ 1 ♀ A. Wörz.
leg., Coll. Klimesch (ZSM), Schwarzwald, Wil-
bod 17.VI.1966 1 ♂ L. Süssner leg. (TLMF).

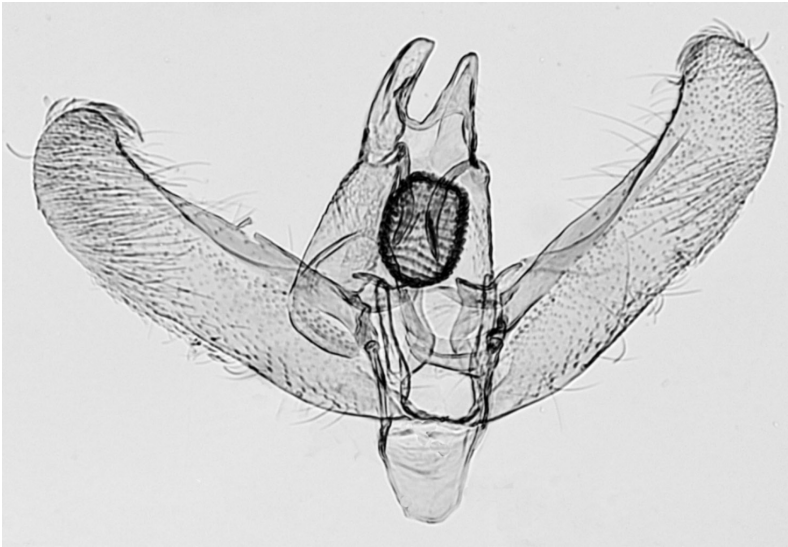


Fig. 6. *Elachista geminatella* (Herrich-Schäffer). ♂ genitalia, aedeagus excluded (Germany, nr. Bonn, Hering leg., L. Kaila prep.nr. 2985).



Fig. 7. *Elachista geminatella* (Herrich-Schäffer). ♂ genitalia (holotype of *Elachista nieukerkeni* Traugott-Olsen) (Spain, Avila, Navarredonda de Gredos, S. Richter & E. J. van Nieukerken leg., prep. nr. E.20.8.87).

Great Britain (England): Norfolk, Merton 3.VIII.1888 1 ♂ (Wlsm. 84835), 25.VII.1891 1 ♂ (Wlsm. 86474), 25.VII.1894 1 ♂ (Wlsm. 85463), 29.VII.1894 2 ♂ (Wlsm. 85466, B. M. slide 29771 and Wlsm. 85469, B. M. slide 28593), 2 ♀ (Wlsm. 85470, B. M. slide 28595, Wlsm. 85469, B. M. slide 28593), 5.VIII.1894 9 ♂ 4 ♀ (Wlsm. 85471-3, 85475-7, 85879-83, 85888-9), all Walsingham leg. & Coll. (BMNH). **Latvia:** Pape 17.VII.1993 1 ♂ 1 ♀ N. Savenkov leg. & Coll.; Riteri 22.VII.1991 1 ♂ I. Šulcs leg.; 8.VII.1998 1 ♂ J. Junnilainen leg.; 4.VII.1999 12 ♂ 3 ♀ J.

Junnilainen leg. & Coll., 9 ♂ 1 ♀ S. Kerppola leg. & Coll.; Livonia 1 ♂ Lienig leg., Coll. Zeller (BMNH). **The Netherlands:** Savelsbos, e. l. 1986 1 ♀, 1998 3 ♀ (*Luzula* sp.) A. Scheurs leg. (Coll. Biesenbaum.) **Slovakia:** Vráble 9.VI.1987 1 ♂ Bengtsson leg. & coll. **Spain:** Avila, Navarredonda de Gredos, 4.VIII.1986 1 ♂ S. Richter & E. J. van Nieukerken leg. (NNML), (holotype of *Elachista nieukerkeni* Traugott-Olsen, see Remarks below.) **Sweden:** Gotland, Gammelgarn, Sjaustrehammarn 16.–18.VI.1985 1 ♂ O. Karsholt leg. (ZMUC); Närshamn 21.VII.1980 1 ♂ Bengtsson leg. &

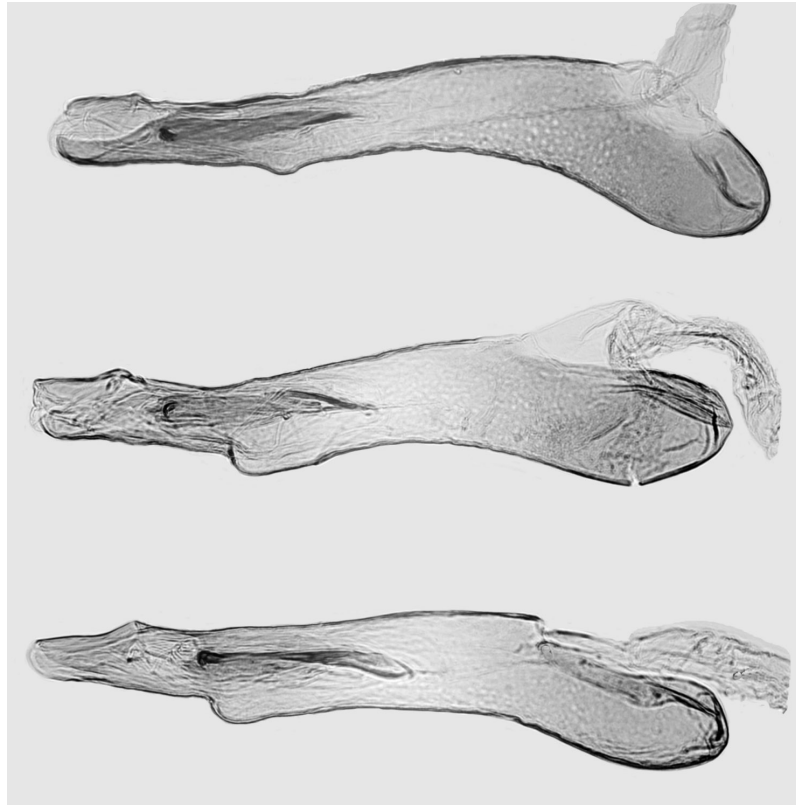


Fig. 8. *Elachista geminatella* (Herrich-Schäffer). ♂ aedeagus. Top: Austria merid., Kärnten, St. Jakob i. Lesachthal, Huemer & Erlebach leg., L. Kaila prep. nr. 3151; center: Germany, nr. Bonn, Hering leg. L. Kaila prep. nr. 2985; bottom: Germany, Bad-Baden E. Linack leg., L. Kaila prep. nr. 2990.

Coll.; Halland, Veinge stn 19.VII.1996 1 ♂ Bengtsson leg. & Coll.; Skåne, Vitemölla 12.VII.1995 1 ♂ Bengtsson leg & Coll.; Öland, Tocknekärr 29.VII.1975 1 ♂ O. Karsholt leg. (ZMUC).

Diagnosis. Wingspan 7.8–9.6 mm. Externally, most specimens of *E. geminatella* are characterised by the costal and ternal spots that are situated somewhat closer to each other than in *E. regificella* and *E. tengstromi*. This characteristic is not, however, constant and cannot be used as criterion for identification. In the male genitalia, the cornutus is broader in *E. geminatella* than in the other species, that of *E. regificella* being somewhat narrower and that of *E. tengstromi* considerably narrower than in *E. geminatella* (Fig. 10). The aedeagus of *E. geminatella* has a characteristic swelling ventrolaterally which, however, is easily hidden if the aedeagus is in an unfavourable position. Such a swelling is not present either in *E. tengstromi* or *E. regificella*. Besides the width of cornutus and the ventrolateral swelling of the aedeagus, *E. geminatella* can be identified

from *E. regificella* by the somewhat shorter valva: the length of valva – length of aedeagus ratio is on average 1.1 (n = 11, min. 1.0, max. 1.2). The female genitalia of *E. geminatella* are characteristic with the very large and distinctly sclerotised posterior dilation of the ductus bursae (Figs. 9, 10). The length of the dilation is nearly twice as long as apophyses posteriores. The posterior spine group of the dilation is situated in a well-delimited sclerotised plate which is fused to a strongly sclerotised longitudinal ridge. The ridge of *E. geminatella* variably contains either a few prominent thorns or a long row of smaller teeth. In *E. geminatella* the total length of the ductus bursae (including colliculum) is about 5.5 times the length of the apophyses posteriores (min = 5 times, max = 6.5 times, n = 11). The ductus bursae of *E. geminatella* has a few coils anteriorly. See also the diagnoses of the other species.

Biology. *E. geminatella* occurs on dry, sunny calcareous meadows. It has been reared from *Luzula sylvatica* Hudson (Gaudin) in Germany by Hering. In Latvia and Sweden the species oc-



Fig. 9. *Elachista geminatella* (Herrich-Schäffer). ♀ genitalia, neotype (Germany, nr. Bonn, Hering leg., L. Kaila prep. nr. 2973).

curs in sites where *L. sylvatica* does not occur. *L. campestris* (L.) DC. could be a possible host plant in these localities, but thus far searches of larvae have been unsuccessful.

Distribution. Europe (Austria, Belgium, Denmark, France, Germany, Great Britain (England),

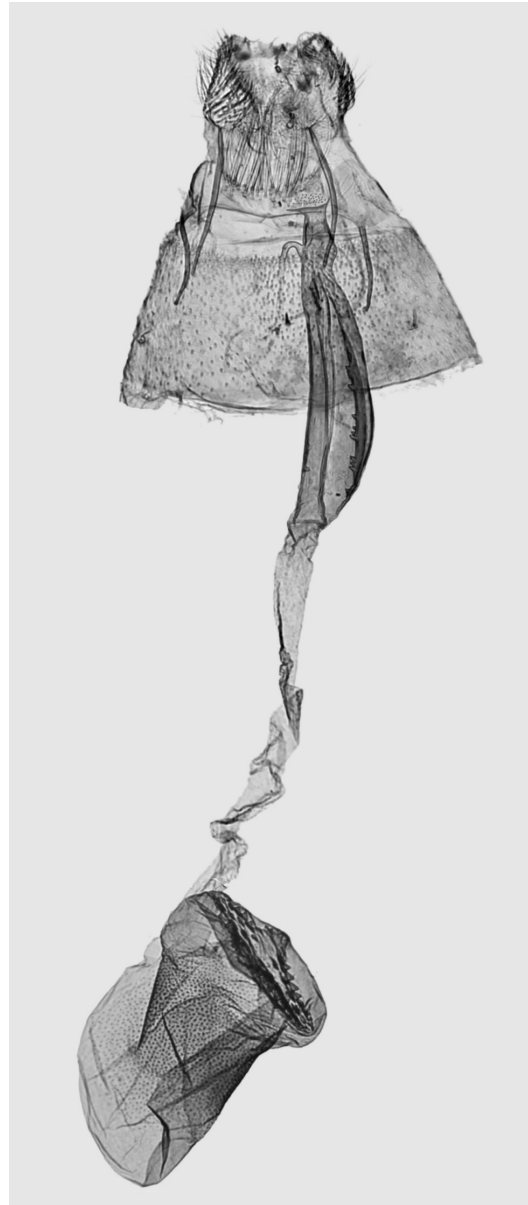


Fig. 10. *Elachista geminatella* (Herrich-Schäffer). ♀ genitalia (Netherlands, Savelbos, Scheurs leg., L. Kaila prep. nr. 2975).

Latvia, The Netherlands, Slovakia, Spain, Sweden).

Remarks. When Herrich-Schäffer (1855: 309) introduced the name *geminatella* he listed the names *magnificella* Tengström and *regificella* Sircom as (senior) synonyms of his *geminatella*. The original description of *geminatella* was not

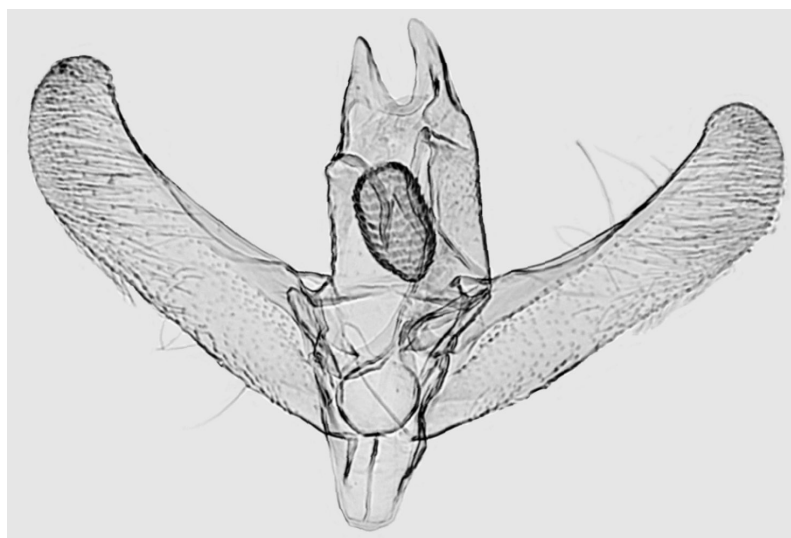


Fig. 11. *Elachista tengstromi* nom. nov. ♂ genitalia, aedeagus excluded (L. Kaila prep.nr. 2949, Finland, Al: Saltvik, Nylund leg.).

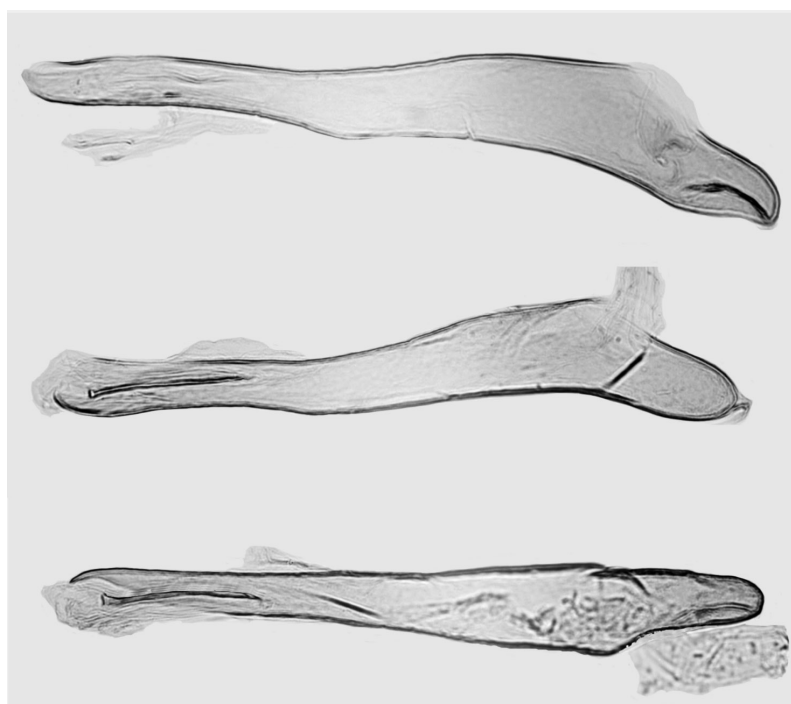


Fig. 12. *Elachista tengstromi* nom. nov. ♂ aedeagus. Top: Finland, Ab: Hiittinen, Nylund leg. L. Kaila prep. nr. 2950; center: Austria, Sommerau, J. Klimesch leg., L. Kaila prep. nr. 2991; bottom: Germany, Berlin-Frohnau, D. & M. Hering leg., L. Kaila prep. nr. 2987.

published in synonymy in the sense of ICZN 1999, article 11.6, since Herrich-Schäffer himself treated the name as valid and thus made it available in the sense of ICZN, article 11.6.1. The description of *geminatella* refers to partly different material from those of *magnificella* Tengström or *regificella* Sircom. Therefore the name cannot be

treated as an objective junior synonym of either of these names.

In the original description of *Poeciloptilia geminatella*, Herrich-Schäffer (1855) lists Regensburg (Germany), England and Sweden as the sites of occurrence of the species. We have selected as the neotype a reared female specimen in good



Fig. 13. *Elachista tengstromi* nom. nov. ♀ genitalia (Sweden, Gotland, Irevik O. Karsholt leg., L. Kaila prep. nr. 3251).

condition, collected from Germany, Drachenfels, situated near Bonn. In our opinion, this designation does not violate the content of the quite loose

distributional range given by Herrich-Schäffer (1855). Along with the neotype designation this locality becomes the type locality of the species. The name *Elachista magnificella* Zeller, 1847 is probably referable to this species. However, the name is unavailable due to homonymy (*nec Oecophora magnificella* Duponchel, 1843, which is a junior synonym of *Elachista gleichenella* (Fabricius)).

The description of *Elachista nieukerkeni* Traugott-Olsen, 1995 was based on one male specimen collected from Navarredonda de Gredos, central Spain. The author mentions the unicolorous antennae as the main distinguishing character of *E. nieukerkeni* from *E. regificella*. This must have been a lapsus, since the male specimens of all these species have unicolorous antennae, while the distal part of the *females only* are white. The genitalia of *E. nieukerkeni* agree in all respects with those of *E. geminatella* (H. S.). The apparent difference in the shape of valva is obviously an artifact produced by superfluous pressing of the genitalia during preparation of the holotype slide of *E. nieukerkeni*. To test this conclusion we squeezed some genitalia of *E. geminatella* preserved in glycerol, and the result was much like that in the holotype slide of *E. nieukerkeni* (Fig. 7). Therefore we consider *E. nieukerkeni* to be a junior synonym of *E. geminatella*, syn. nov. The female genitalia illustration presented as *E. regificella* in Traugott-Olsen & Nielsen (1977) represents *E. geminatella*.

***Elachista tengstromi* nom. nov. (Figs. 1 (bottom row), 11–14)**

Elachista magnificella Tengström, (1848) 1847: 147, *nec* Duponchel, 1843

Material studied. Type material: Holotype of *Elachista magnificella* Tengström, labelled: Holotypus (red); Åbo (Finland Ab: Turku) Sahlb (Sahlberg); Coll. Tengstr (white); Mus. Zool. H:fors Spec. type No 7086 *Elachista magnificella* Tengstr; Gen. präp. Gaed. (Gaedike) 1420 (white); *Elachista magnificella* Tengstr. Holotypus det. R. Gaedike 73 (white with red border); lectotypus *E. magnificella* Tgstr. teste U. Parenti 74 (red); 804; *Elachista regificella* Sirc. det. E. Traugott-Olsen (ZMH).

Other material (with 34 ♂ 18 ♀ genitalia preparations): **Austria:** Summerau 9.VIII.1973 1 ♂ J. Klimesch leg. (ZSM); Bonnerwald, Schöneben. 900 m, 12.VIII.1962 1 ♀ J. Klimesch leg. (ZSM). **Denmark:** Løvenholm Skov 5.VII.1968 1 ♂ E. Traugott-Olsen leg. (ZMUC); Grib Skov 3.VIII.1968 1 ♀ "J E J" leg. (ZMUC); WJ, Gindeskov Krat, 28.VII.1968 1 ♂ O. Karsholt leg. (ZMUC); Fyrrevenget 30.VII.1968 1 ♂ (no collector) (ZMUC); NEZ, Rude Skov, 1 ♂ 1 ♀ e. l. (*Luzula pilosa*) 1932 C. S. Larsen leg. (ZMUC); F: Fåborg, Lyngbakkerne 23.VII.1917 1 ♀, 13.VII.1917 1 ♀ C. S. Larsen leg. (ZMUC). **Finland:** *At:* Eckerö, Skag 16.VI.1948 1 ♂, 7.VIII.1949 1 ♂, 9.VIII.1949 1 ♂, 11.VII.1952 1 ♀ A. Nordman leg. (ZMH); Föglö 1 ♂ Hellén leg. (ZMH); Lemland 2.VII.1947 1 ♂ A. Nordman leg. (ZMH); 2.VIII.1951 1 ♂ Nylund leg. (ZMH) Lemland 667:11 8.VIII.1991 1 ♀ K. Vaalamo leg. (ZMH); Lemland, Flaka 9.VIII.1952 1 ♂ Lankiala leg. (ZMH); Mariehamn 10.VIII.1947 1 ♀ Nordman leg. (ZMH), 1 ♂ Lingonblad leg. (ZMH); Saltvik 12.VII.1941 1 ♂, 21.VII.1941 2 ♂, 24.VII.1947 1 ♂ Nylund leg. (ZMH); *Ab:* Bromarv 5.VIII.1922 1 ♀ Lankiala leg. (ZMH); Hiittinen 5.VII.1944 1 ♂ Nylund leg. (ZMH), 3.VII.1949 1 ♀ Lankiala leg. (ZMH); Houtskari 25.VII.1940 1 ♀ Lankiala leg. (ZMH); Karjalohja 668:32 22.VIII.1994 1 ♀ H. Krogerus leg. (ZMH); Kiikala 671:30 13.VIII.1982 2 ♂ A. Albrecht leg. (ZMH); Korppoo 1 ♂ E. Reuter leg. (ZMH); 15.VIII.1941 1 ♀, 21.VII.1959 1 ♀ Wegelius leg. (ZMH); Lohja 27.VII.1932 1 ♀ Lingonblad leg. (ZMH); Lohja 668:32 27.VII.1961 1 ♀, 3.VIII.1961 1 ♂ 1 ♀, 19.VIII.1966 1 ♀, 18.VII.1973 1 ♂ H. Krogerus leg. (ZMH); Lohjan mlk Lieviö e. l. 1991 1 ♀, 1992 1 ♂ (*Luzula pilosa*) E. Laasonen leg. (ZMH), Lohjan mlk. Muijala e. l. 1990 1 ♂, 1992 1 ♀ E. Laasonen leg. (ZMH); Naantali 1 ♀ Hellén leg. (ZMH); Nauvo 1 ♂ Hellén leg. (ZMH); Parainen 6 ♂ 1 ♀ E. Reuter leg., 1 ♂ Hellén leg. (ZMH); Uusikaupunki 2 ♂ 1 ♀ Hellén leg. (ZMH); *N:* Espoo 1.VII.1921 2 ♂, 9.VIII.1922 1 ♂, 29.VII.1926 1 ♂ Lankiala & Karvonen leg. (ZMH), e. l. 1 ♂ (*Luzula pilosa*) 1992 K. Vaalamo leg. (ZMH); Espoo, Oitbacka e. l. 1991 1 ♀ (*Luzula pilosa*) E. & L. Laasonen leg. (ZMH), Espoo Järvenperä 669:37 2 ♂ e. l. 1991 (*Luzula pilosa*) L. Kaila leg. (ZMH); Hanko 22.VII.1992 2 ♂ H. Krogerus leg. Hanko 664:28 e. l. 1992 6 ♂ 1 ♀ J. Kullberg leg. (Coll. Kullberg); (ZMH); Hanko,

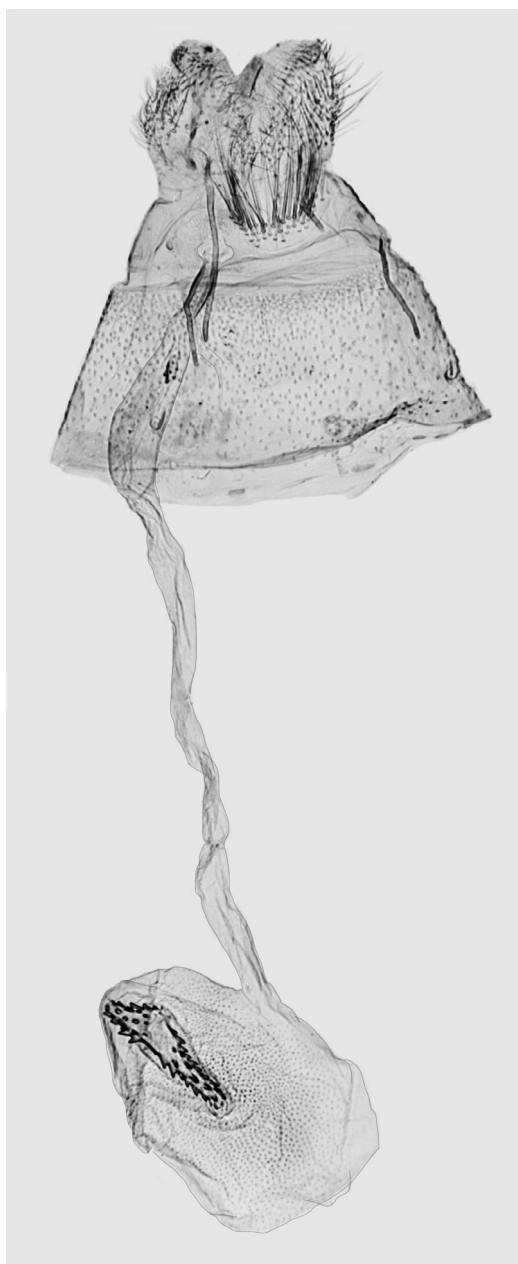


Fig. 14. *Elachista tengstromi* nom. nov. ♀ genitalia (Poland, Soldany J. Buszko leg., L. Kaila prep. nr. 3247).

Tvärminne 20.VII.1927 1 ♂ Kanerva leg. (ZMH); 1 ♀, 12.VII.1936 1 ♂, 8.VII.1934 1 ♂ W. Hackman leg. (ZMH); Helsinki 1 ♀ Palmén leg. (ZMH); 20.VII.1934 1 ♂ O. Nybom leg. (ZMH); Kirkkonummi, Aavaranta e. l. 1991 1 ♂ 1 ♂ K.

- Vaalamo leg. (ZMH); Nurmijärvi, Klaukkala e. l. 1998 1 ♀ J.-P. Kaitila leg. (ZMH); Porvoo 21.VIII.1955 1 ♀ A. Nordman leg. (ZMH); Porvoo, Weckjärvi 1 ♂ W. Hackman leg. (ZMH); Sipoo 669:40, 2.VIII.1982 1 ♀ A. Albrecht leg. (ZMH); Sipoo, Nevas 668:41 9.–15.VII.1984 1 ♂, 6.VIII.1994 1 ♂, 10.–12.VII.1990 1 ♂ 1 ♀ A. Albrecht leg. (ZMH); Tammisaari, Gästans 664:31 e. l. 1991 4 ♂ 5 ♀, 1998 2 ♂ 1 ♀ (*Luzula pilosa*) L. Kaila leg. (ZMH); Tammisaari, Nothamn 10.–24.VII.1943 1 ♂ 1 ♀ A. Nordman leg. (ZMH); Tammisaari, Strömsö 2 ♂ Klingstedt leg. (ZMH); Tuusula 29.VII.1921 1 ♀, 30.VII.1922 1 ♂, 5.VIII.1923 2 ♂ 1 ♀ Lankiala leg. (ZMH); Vantaa 4 ♂ 4 ♀ e. l. 1989, 1 ♀ e. l. 1990 (*Luzula pilosa*) J. Junnilainen leg. & Coll.; Vantaa 668:39 e. l. 1 ♂ 1989, 1990 3 ♀ (*Luzula pilosa*) J.-P. Kaitila leg. (ZMH), e. l. 1 ♂ 1990, 3 ♂ 3 ♀ 1991 (*Luzula pilosa*) L. Kaila leg. (ZMH); *St*: Parkano 687:27 26.VII.1982 1 ♂ A. Kullberg leg. (Coll. Kullberg); Reposaari 1949 2 ♂ 3 ♀ V. Lauro leg. (ZMH); *Ta*: Nastola, Uusikylä e. l. 1 ♀ (*Luzula pilosa*) 1991 E. & L. Laasonen leg. (ZMH); *Sa*: Imatra 26.VII.1953 1 ♀, 12.VII.1954 1 ♂, 20.VII.1959 1 ♀ O. Nybom leg. (ZMH); Ruokolahti 5.VII.1948 W. Hellén leg. (ZMH); *Oa*: Vasa, Replot 1 ♂ Storå leg. (ZMH); *Tb*: Keuruu 1 ♀ Hellén leg. (ZMH). **Germany**: Blankenburg, Zechstein 2.VIII.1980 1 ♀, 7.VIII.1980 1 ♂ (reared from *Luzula pilosa*) H. Steuer leg. (ZSM); Bärenkopf bei Goslar emg. 3.VIII.1918 1 ♂ (*Luzula pilosa*) e. Bauer leg. (ZSM); Erlangen 31.VII.–2.8.1858 3 ♀♀ e. l. (*Luzula*) O. Hofmann leg., Stainton Coll. (1 ♀ dissected, B. M. slide 29789) (BMNH); Freiburg VI.63 1 ♂ (B. M. slide 29788) 1 ♀ Zeller Coll. in Coll. Walsingham (BMNH), Berlin-Frohnau, IV.1929 1 ♂, VI.1929 3 ♀, all reared from *Luzula pilosa* O. & M. Hering leg. (MNHB). **Great Britain (England)**: Kent, Bexley 1 ♂ bred 30.VII, 1 ♂ bred 2.VIII.1940, 2 ♂ bred 28.VII.1942 (BM slides 2122 and 2123), 1 ♀ bred 21.VII.1940 (B. M. slide 28598), all S. Wakely leg. (BMNH); N. Kent, Ford 15.VII.1939 1 ♀ S. N. A Jacobs leg. (B. M. slide 29770) (BMNH); Newport Monmouth 21.VII.1860 1 ♂ Stainton leg. (B. M. slide 28599) (BMNH). **Japan**: Hokkaido, Uenai Tomakomai City, emg. 17.VI.1998 1 ♂, 12.VI.1998 1 ♀ (*Luzula capitata*) K. Sugisima leg. (ZMH); Hokkaido, Sibetu, Sibetu-Town 10.VIII.1993 1 ♂ Y. Sakamaki leg., (SEHU), Koshimizu-cho, Hamakoshimizu, 19.VI.1995 1 ♀ S. Kawahara leg. (SEHU). **Latvia**: Püre 25.VII.1961 1 ♂ I. Šulcs leg. & Coll.; Svēte 6.VIII.1985 1 ♂, 14.VIII.1985 1 ♀ I. Šulcs leg. & Coll.; Carnikava 5.VIII.1983 1 ♂ *ad luc.* N. Savenkov leg. & Coll.; Lepste 15.VII.1987 1 ♂, e. l. (*Luzula* sp.) N. Savenkov leg. & Coll.; Garupe 27.IV.1989 1 ♂, 1.V.1989 1 ♀ e. l. (*Luzula* sp.) N. Savenkov leg. & Coll.; Silene, Ilgas 11.VII.1990 3 ♂ N. Savenkov leg. & Coll.; Kūdra 14.VII.1993 1 ♂ *ad luc.* N. Savenkov leg. & Coll.; Mārciena 1.VIII.1991 1 ♂ 1 ♀, 10.VIII.1993 1 ♂ N. Savenkov leg. & Coll.; Šķeltiņi VII.1993 1 ♂ A. Baroņevskis leg. & Coll.; Ragaciems 9.VIII.1983 1 ♀ N. Savenkov leg. & Coll. **Norway**: EIS 12 Ø, Hvaler: Asmaløy, Huser 30.VII.1997 1 ♂ L. Aarvik leg. & Coll. **Poland**: CD 38 Res. Las Piwnicki e. l. 16.VI.1999 1 ♂ 18.VI.1999 1 ♂ (*Luzula pilosa*) T. Baran leg. & Coll.; Soldany , e. l. 1991 1 ♀ J. Buszko leg. & Coll.; Silesia 1/77 1 ♂ 1 ♀ Staudinger, Stainton Coll. (BMNH). **Russia**: Karelia Rep.: Ruskeala reg. e. l. 1991 2 ♀ L. Kaila leg. (ZMH); Valamo 14.VII.1938 1 ♂ N. Kanerva leg. (ZMH); Leningrad obl.: Viborg 1 ♀ Thuneberg leg. (ZMH); Kurils: Kunashir Isl., Yu.-Kurils'sk VII.1997 1 ♀ Yu. M. Marusik leg. (ZMH). **Sweden**: Gotland, Irevik 30.VII.1985 1 ♀ O. Karsholt leg. (ZMUC); Småland, 4 km N Bäckebo 28.VII.1991 1 ♀ Bengtsson leg. & Coll.; Öland: Högby, Gudesjö 28.VII.1996 1 ♂; Skäftekärr, 5.VIII.1976 1 ♂; Getterum 12.VII.1981 1 ♂, all Bengtsson leg. & Coll.; Östergötland, Norsholmen, Grensholm 9.VII.2000 2 ♂ Bengtsson leg. & Coll. **Switzerland**: Zürich, e. l. 1 ♂ Frey leg., Frey Coll. Brit. Mus. 1890-62 (B. M. slide 28597) (BMNH).
- Diagnosis.* Wingspan 7.0–9.3 mm. The tornal spot of the female *E. tengstromi* is usually broader triangular than in *E. geminatella* and *E. regificella*, sometimes even being a broad, roundish spot (Fig. 1, bottom row). The median fascia tends to be slightly larger and more regularly 8-shaped than in the other two species. In the structure of the male genitalia *E. tengstromi* is readily distinguished from the other species by the very narrow cornutus in the aedeagus. It usually also has a characteristically prolonged and oblique cucullus of the valva. The female colliculum, as interpreted

to be the part of the ductus bursae situated between the ostium bursae and the inception of ductus seminalis, is significantly longer in *E. tengstromi* than in the other two species which do not differ from each other with respect of this characteristic. The ratio of the length of apophyses posteriores – length of colliculum is on average 0.5 ($n = 12$, min. 0.5, max. 0.6), the average being 0.3 in the other species with no overlap with *E. tengstromi* ($n = 11$ for *E. geminatella*, 5 for *E. regificella*). The length of the posterior dilation is 1.3 times longer than apophyses posteriores in *E. tengstromi*. The dilation is similar to that in *E. regificella* but has a more distinctive longitudinal sclerotised ridge with a few spines anteriorly. In *E. tengstromi* the total length of the ductus bursae (including colliculum) is on average 5.5 times the length of the apophyses posteriores (min = 5 times, max = 7 times, $n = 12$). The ductus bursae of *E. tengstromi* is straight, with no spiral coilings. See also the diagnoses of the other species.

Biology. The species has been recorded only on *Luzula pilosa* L. (Willd.) in Europe. In Hokkaido, Japan it has been reared from *Luzula capitata* (Miquel) Komarov (K. Sugisima pers. comm.). Steuer (1980) gives a thorough outline of the biology of this species (as *regificella*). In Finland mines of *E. tengstromi* can be found at any time of the year, but most commonly the species hibernates as a small larva. In spring it develops slowly until early to mid-June. Larvae can be found in leaves of *Luzula pilosa* growing on semi-shady or open places, often together with *E. gleichenella* (F.) in open and *E. trapeziella* (Stt.) in more shady sites. Adults have been recorded from mid-June to late August, the peak of records being around mid-July.

Distribution. Transpalaeartic (Austria, Denmark, England, Finland, Germany, Japan, Latvia, Norway, Poland, Russia, Sweden, Switzerland).

Remarks. The oldest name given to this species is *E. magnificella* Tengström, 1848, which is not nomenclatorically available due to homonymy. Since *Elachista tengstromi* nom. nov. is an objective replacement name of *Elachista magnificella* Tengström, 1848, the holotype of *E. magnificella* Tengström will automatically serve as the holotype of *E. tengstromi*. The male genital illustration representing *E. regificella* in

Traugott-Olsen & Nielsen (1977), and both male and female genitalia presented by Steuer (1980) apply to this species.

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