Elachista baltica Hering, 1891 sp. rev. – a valid species of Elachistidae from the Baltic shore (Lepidoptera: Gelechioidea)

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Elachista baltica Hering, 1891, previously synonymised with *Elachista freyerella* (Hübner, 1825) is considered to be a good species. Morphological differences between *E. baltica* Hering, 1891, *E. consortella* Stainton, 1851, *E. exactella* (Herrich-Schäffer, 1855), *E. freyerella*, and *E. stabilella* Stainton, 1858 are presented and discussed. *E. baltica* is redescribed, including morphology of genitalia of both sexes, full grown larva and details on biology. The adults of *E. baltica* have been reared from larvae mining on *Festuca rubra* ssp. *arenaria* (Obs.) Syme.

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1. Introduction

In April–May of 2001–2003, the authors collected a number of tenanted mines of Elachistidae on *Festuca rubra* ssp. *arenaria* (Obs.) Syme overgrowing sand dunes of the Polish Baltic coast. From these mines, apart from specimens of *Elachista argentella* (Clerck, 1759) and *E. bedellella* (Sircom, 1848), a series of moths belonging to the *freyerella* species-group *sensu* Kaila (1999b) was reared [= genus *Cosmiotes* Clemens in Traugott-Olsen & Nielsen (1977)]. However, the specimens did not exactly fit to any species mentioned by Traugott-Olsen and Nielsen in their work on Elachistidae. In "Notes" they mentioned *Elachista baltica* Hering as a synonymy of *Cosmiotes freyerella* (Hbn.). *E. baltica* has been described after specimens found in Międzyzdroje, a small town in the island of Wolin at the Baltic shore. The specimens were bred from larvae mining on *Festuca rubra* ssp. *arenaria* (Obs.) Syme and *Koeleria macrantha* (Ledeb.) Schultes (*Koeleria cristata* auct.) (Hering 1891). These facts indicated that the unidentified specimens may belong to the species described by Hering (1891), but erroneously synonymised with *E. freyerella* by Traugott-Olsen & Nielsen (1977). Consequently, the authors carried out a comparative research dealing with all central European Elachistidae from the *freyerella* species group. The aim of the study was to clarify taxonomical problems within this relatively homogeneous species group. The examination revealed that *E. baltica* and *E. freyerella* are distinct species of Elachistidae, and that the authors' specimens indeed belong to *E. baltica*.

Therefore, the synonymy proposed by Traugott-Olsen & Nielsen (1977) is reversed here. Detailed data on the morphology of an adult and a last instar larva, and biology of *E. baltica* Hering, 1891 are given. The species is also compared with other related species of the family Elachistidae: *E. consortella* Stainton, 1851, *E. exactella* (Herrich-Schäffer), and *E. stabilella* Stainton, 1858.

2. Materials and methods

The material consisted of 73 specimens belonging to 5 species of Elachistidae: *Elachista baltica* (44 ex. from Poland; MIZW, TBA, BUS), *E. consortella* (2 ex. from Slovakia; TBA), *E. exactella* (4 ex. from Poland; MIZW), *E. freyerella* (17 ex. from Poland and Germany; MIZW, TBA), *E. stabilella* (6 ex. from Denmark; ZMUC). For morphological study of larval morphology, 20 larvae of *E. baltica* and 16 larvae of *E. freyerella* were examined.

Observations on biology of *E. baltica* were made in two sites of northern Poland: in Kołobrzeg (UTM: WA30), and in Unieście (UTM: WA71). The terminology used for description of adult and their genitalia follows Traugott-Olsen & Nielsen (1977) and Kaila (1999a–b). The terminology on larval morphology is adapted from Hinton (1946) and Hasenfuss (1980).

Male and female genitalia were drawn from microscope slides without applying cover glasses. This method was used to avoid deformation of the genitalia structures. Otherwise, before studying, female genitalia were held in a drop of glycerine with solution of Chlorazol Black for 24 hours. As a result of this procedure, membraneous parts were stained, and corpus bursae in the genitalia gained its natural shape.

In the paper, the following abbreviations are used for museums, institutions, and private collections:

BUS – coll. J. Buszko, Toruń, Poland.
TBA – coll. T. Baran, Rzeszów, Poland.
MIZP – Museum and Institute of Zoology, Polish Academy of Sciences, Warszawa, Poland.
ZMUC – Zoological Museum, University of Copenhagen, Copenhagen, Denmark.

3. Results

Elachista baltica Hering, 1891

Material examined. Lectotype ♀: 'Z 7/7 89 Fest. ar. Misdroy' (MIZP) [7.VII.1889, e. l. *Festuca rubra* ssp. *arenaria* (Obs.) Syme, Poland, Międzyzdroje, leg. E. Hering]; genitalia slide: 'A. 26.9.76 *Elachista baltica* E. Hering = *Cosmiotes freyerella* (Hübner, 1825), E. Traugott-Olsen & E. Nielsen' (MIZP). Other material (included 18 genitalia slides): 5 ♂♂ 4 ♀♀ [3.VII–20.VII. 1889, e. l. *Festuca rubra* ssp. *arenaria* (Obs.) Syme, Poland, Międzyzdroje, leg. E. Hering] (MIZP); 2 ♀♀ [4.VIII.1887, e. l. *Koeleria macrantha* (Ledeb.) Schultes ('*Koeleria cristata*' auct.), Poland, Międzyzdroje, leg. E. Hering] (MIZP); 1 ♂ [19.VII.1888, e. l. *Koeleria macrantha* (Ledeb.) Schultes, Poland, Międzyzdroje, leg. E. Hering] (MIZP); 1 ♀ [11.VII. 1889, e. l. *Koeleria macrantha* (Ledeb.) Schultes, Poland, Międzyzdroje, leg. E. Hering] (MIZP); 1 ♀ 15.V., 4 ♀♀ 16.V., 4 ♀♀ 1 ♂ 7.V.2001, e. l. *Festuca rubra* ssp. *arenaria* (Obs.) Syme, Poland, Kołobrzeg, leg. J. Buszko (TBA, BUS); 2 ♂♂ 1 ♀ 11.V.2002, 1 ♀ 13.V., 2 ♂♂ 14.V., 1 ♂ 15.V., 3 ♂ 16.V., 1 ♂ 2 ♀♀ 19.V.2003, e. l. *Festuca rubra* ssp. *arenaria* (Obs.) Syme, Poland,

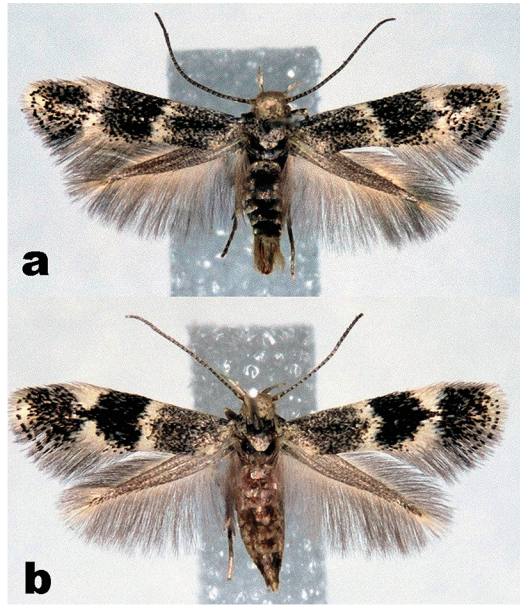

Fig. 1. *Elachista baltica*. – a. Male (wingspan 8.2 mm). – b. Female (wingspan 8.3 mm).

Kołobrzeg, leg. T. Baran (TBA); 1 ♀ 11.V., 1 ♂ 13.V.2002, 1 ♂ 16.V., 3 ♂♂ 17.V., 1 ♀ 20.V. 2003, e. l. *Festuca rubra* ssp. *arenaria* (Obs.) Syme, Poland, Unieście, leg. T. Baran (TBA).

Description. Male (Fig. 1a): wingspan 7.3–8.5 mm. Head and neck tuft creamy white to white or somewhat mottled with dark greyish-brown or brownish tipped scales, especially on vertex; labial palpus white, sometimes only slightly suffused with brown ventrally; flagellum dark greyish-brown, ringed paler. Tegula and thorax dark greyish-brown, strongly mottled by white basal parts of scales. Basal part of fore wing coloured like thorax, darker scales form a line in fold, white basal spot at dorsum often present. Distal part of fore wing darker, sometimes almost blackish-brown, mottled by white basal parts of scales. Almost entirely dark scales form two elongated spots adjacent to fascia (the spots often coalescent), as well as short line between white costal and tornal spots. These dark markings are more distinct in paler specimens. Fascia before middle of the wing white, and a little oblique, with more or less irregular edges (sometimes zigzag shaped). White costal and tornal spots distinct, opposite. White apical spot elongated, more or less distinct, also small cilia spot present (sometimes apical spot indistinct or joined with costal and tornal spots). Cilia pale greyish-brown except for whitish part at the apex; cilia line dark greyish-brown. Hind wing and its cilia pale greyish-brown. Abdomen pale greyish-brown dorsally, strongly covered with white and ochreous scales ventrally. Anal tuft dorsally ochreous, with some grey tipped scales; ventrally mixed with whitish and ochreous scales.

Female (Fig. 1b): wingspan 7.5–8.9 mm. In general coloured like male, except for: flagellum more distinctly ringed; basal part of fore wing with more abundant dark tipped scales, and in consequence the line in fold often indistinct. Distal part of the wing almost uniformly dark greyish-brown to blackish-brown, and only slightly mottled by light basal parts of scales (it appears to be darker than in male); white markings more contrasting with ground colour of the wing; apical spot absent; anal tuft small, more greyish-brown dorsally.

Male genitalia (Fig. 2). Gnathos more or less rounded. Inner side of uncus lobe covered with

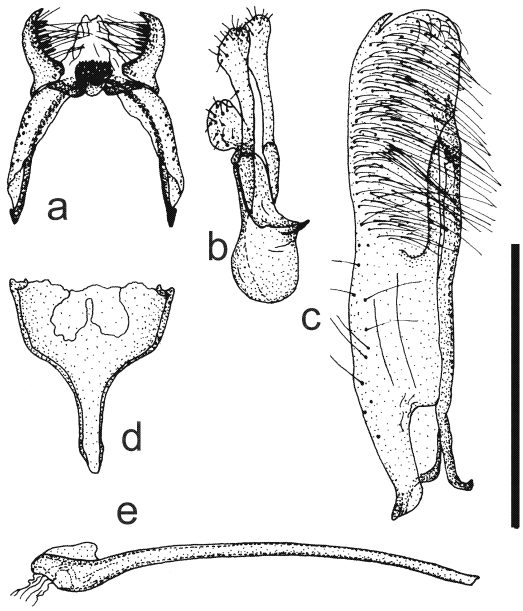

Fig. 2. Male genitalia of *Elachista baltica* (scale bar: 0.5 mm). –a. Complex of tegumen-uncus-gnathos. – b. Complex of digitate processes-juxta lobes-median plate of juxta. – c. Valva. – d. Vinculum with saccus. – e. Aedeagus.

short and thick, and rather long and slender setae, apex of the lobe inwardly directed. Valva with almost parallel sides, setose, especially in distal half and along sacculus. Distal spine of sacculus prominent. Juxta lobes setose, rounded apically. Digitate process long, distinctly broadened distally, setose in apical part. Aedeagus somewhat bent and tapered from basal part towards apex, its basal part strongly broadened, with prominent dorsal lobe of caecum. Vinculum tapering gradually into stout saccus.

Female genitalia (Fig. 3). Papillae anales covered with setae, with the longest setae placed basally. Apophyses posteriores slightly longer than apophyses anteriores. Tergum 8 makes a narrow, transverse band broadened laterally, well sclerotized. Antrum with folds, moderately long and slender, tapering gradually into colliculum; dorsal wall with small spines, ventral margin more or less U-shaped. Corpus bursae relatively long, and rounded anteriorly, covered with internal spines. Signum with opposed 'teeth', rather small in relation to the size of corpus bursae. The ratio of length of corpus bursae (measured from

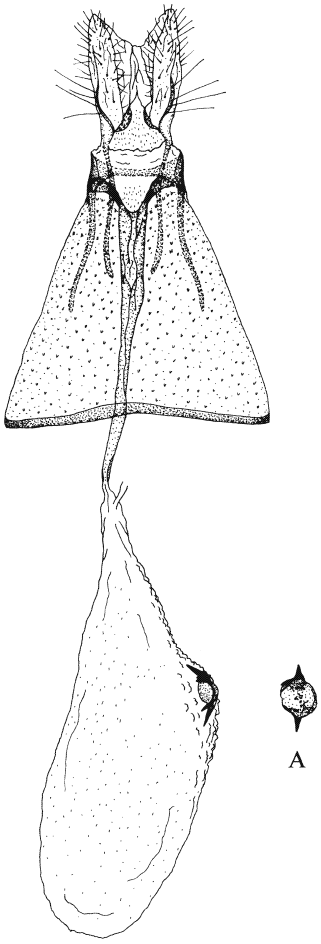

Fig. 3. Female genitalia of *Elachista baltica* (scale bar 0.5 mm). A = signum (dorsal view).

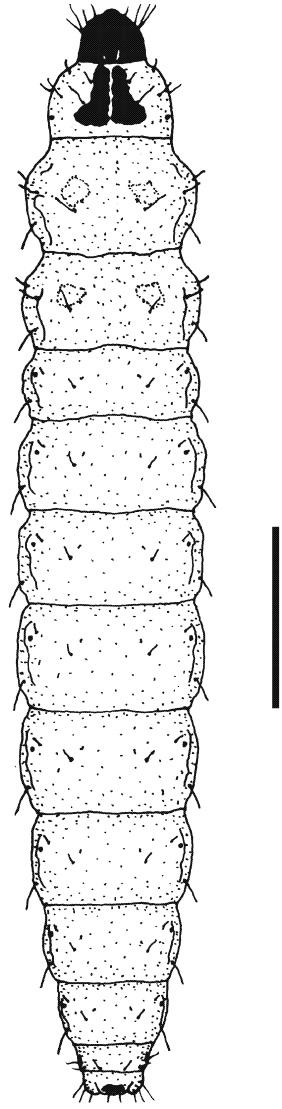

Fig. 4. Mature larva of *Elachista baltica* (scale bar 1 mm).

the anterior end of colliculum to anterior apex of the corpus) to the length of signum is on average 6.6 (n = 10, min. 6, max. 7.8). The central part of signum is circular in outline (dorsal view). Inception of ductus seminalis is near colliculum.

Larva. Last instar (Fig. 4). Body length 5–6 mm. Head dark blackish-brown, except for white lines next to adfrontals. Dorsal prothoracic shield as a pair of elongated and enlarged posteriorly plates with irregular edges, dark blackish-brown but paler in median part (Fig. 5a). Ventral prothoracic shield in a form of rectangular plate with shallow, lateral concavities, as well as distinct anterior and posterior depressions; the plate well sclerotized, dark blackish-brown (Fig. 5b). Anal shield in a form of elongated laterally plate situated above two most dorsal setae; the shield well visible, dark brown or dark brown blackish (Fig. 6a). Sclerites of thoracic legs and basal rings of

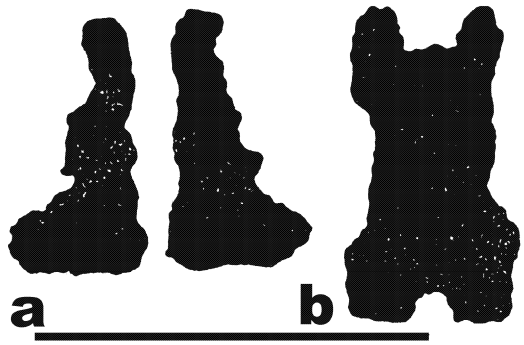

Fig. 5. Larval plates of last instar (scale bar 0.5 mm). – a. Dorsal prothoracic shield. – b. Ventral prothoracic shield.

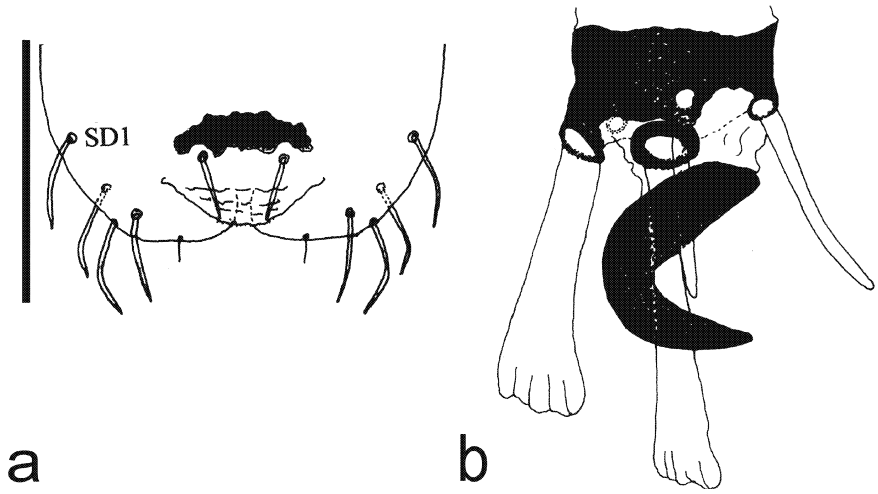

Fig. 6. - a. Dorsal view of abdominal segment X. – b. Tarsus of thoracic leg. Scale bar 0.5 mm for (a) and 0.05 mm for (b).

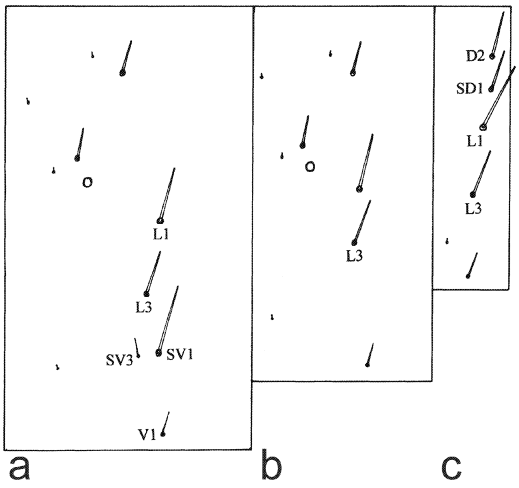

Fig. 7. Setal maps of last instar, abdominal segments VII–IX. – a. VII. – b. VIII. – c. IX.

the setae dark brown blackish. Body of the larva tapered towards the last segment, dark yellowish, but slightly paler in median areas of the segments.

Chaetotaxy (Figs. 6–8). Thorax, T1. – XD1, D1 and D2 near to lateral margin of the prothoracic shield. D2 (microscopic seta) antero-dorsal to D1. SD2 (very small seta) dorso-posterior to SD1. L group trisetose; L2 and L3 dorsal to L1, more or less equal in length. SV group unisetose. V1 next to coxa. MV2 and MV3 (not proprioreceptors) in oblique line. T2–3. – D1 (very small seta) antero-dorsal to D2. SD1 near to L group. SD2 absent. L2 antero-dorsal, whereas L3 postero-dorsal to L1; L3 distinctly longer than L2. SV group unisetose. On the segments, there are proprioreceptors: MD1, MSD1–2, MV1–3; MV2 distinctly remote from the other setae of MV group, close to V1.

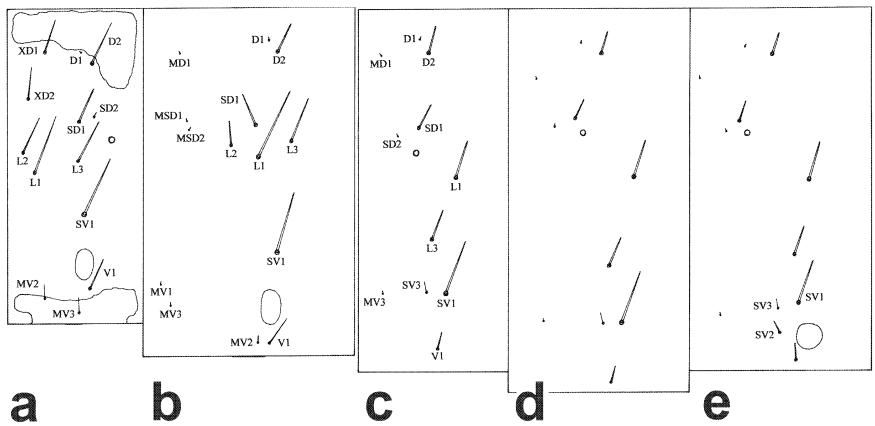

Fig. 8. Setal maps of last instar. – a–b. Thoracic segments. – c–e. Abdominal segments.

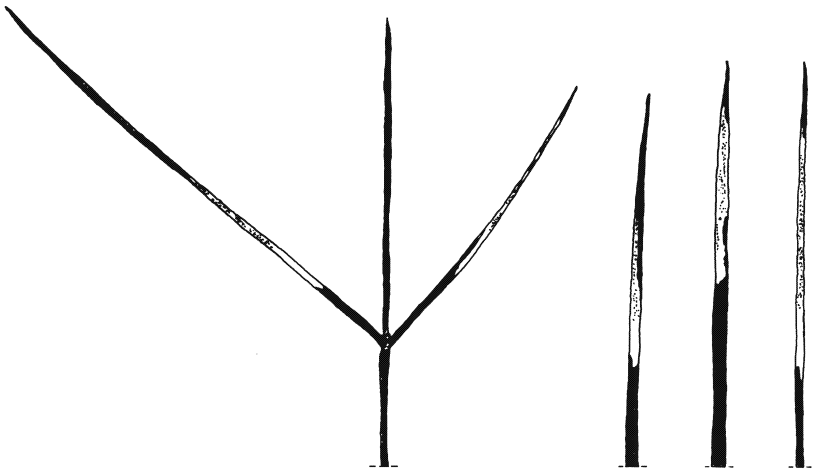

Fig. 9. Mines of larvae of *Elachista baltica* on *Festuca rubra* ssp. *arenaria*.

Two of the tarsal setae (dorsal ones) of thoracic legs modified – enlarged and flattened (Fig. 6b).

Abdomen, AI. – D1 (very small seta) anterodorsal to D1. SD2 (microscopic seta) anterior, and slightly ventral to SD1. L3 (long seta) widely, ventrally separated from L1. SV group bisetose; SV3 anterior to SV1. V1 ventral to SV group. On the segment, two proprioreceptors occur: MD1, and MV3. AII. – Arrangement of the setae similar to the previous segment, but SD group less remote from spiracle. AIII–VI. – Arrangement of MD1, MV3, D, SD, and L groups as on 2nd abdominal segment. SV group trisetose. V1 close to ventral proleg. AVII. – Arrangement of the setae similar to the abdominal segments III–VI, except for: SV group bisetose; SV3 anterior, and slightly ventral to SV1. V1 ventral to SV1. AVIII. – Arrangement of the setae similar to the 7th abdominal segment, but SV1 absent. AIX. – On the segment, the following setae present: D2, SD1, L1, L3, MV3, V1; MD1, D1, and SV1 absent. AX. – SD1 remote from anal shield. The seta situated posterior to sclerotized plate, as well remaining setae of 10th segment of uncertain homology.

Biology. In the study sites, larvae of *Elachista baltica* Hering, 1891 have been found on *Festuca rubra* ssp. *arenaria* (Obs.) Syme only. They mine mainly in lower leaves of this grass. The larvae start mining near the tip of the leaf, then feed downwards, making a flat, whitish, whitish green, or yellowish blotch mine (sometimes the larvae can mine towards the tip of the leaf). The blotch may occupy the whole width of the grass-blade, especially in its proximal half (Fig. 9). The dark green to blackish frass is irregularly scattered within the mine. Generally, the mines of this species are difficult to detect, mainly because of somewhat longitudinally rolled leaves of the food plant. During the research, tenanted mines were collected by the end of April and in the first days of May. Apart from *Festuca rubra* ssp. *arenaria*, Hering (1891) also mentions *Koeleria macrantha* (Ledeb.) Schultes as a host plant for *E. baltica.* However, this grass is not present in either studied localities.

Pupation takes place in a dense 'stiff', white cocoon; in captivity, larvae have pupated outside the host plant, often on walls of the breeding containers. According to label data (both from the authors' and Hering's collections) the species is bivoltine in Poland; the adult flight season extends from mid May to mid June, and from the beginning of July to about half of August.

Elachista baltica has peculiar habitat preferences. It inhabits coastal sand dunes, frequently very close to the sea. For this reason, its habitats are frequently destroyed during strong storms. These dunes are overgrown by only a few plant species, such as *Ammophila arenaria* (L.) Link, *Leymus arenarius* (L.) Hochst., and *Festuca rubra* ssp. *arenaria* (Obs.) Syme (Fig. 10).

Distribution. The species has hitherto been recorded only from three coastal localities in Poland: Międzyzdroje (*locus typicus*), Kołobrzeg, and Unieście. Nevertheless, *Elachista baltica* may well occur in other Baltic countries, too.

4. Diagnosis, and discussion

The adults of *Elachista baltica* are externally similar to other European species of the *freyerella* species group. The males can most easily be confused not with *E. freyerella*, but with *E. stabilella*. Still, the basal area of the fore wings of *E. baltica* is in general paler than the apical area, and the white fascia is almost transversal. Fore wings of males of *E. stabilella* are uniformly dark (i.e. there is no clear difference between basal and apical parts of the wings), and the white fascia is more sloping. The males of *E. freyerella*, in turn, can be distinguished from those of *E. baltica* mainly by less pronounced white markings, strong suffusion with dark tipped scales on the head and neck tufts, and by darker dorsal parts of labial palpi in relation to ventral ones. From two other elachistids of this group, viz. *E. consortella* and *E. exactella*, *E. baltica* can be separated mainly by the paler head and neck tufts. Vertex and neck tufts of *E. consortella* are covered with scales which are light greyish-brown basally, and dark brown apically. On the other hand, these characters in *E. exactella* are dark brown, and are only somewhat mottled by whitish basal parts of scales. The fascia in *E. exactella* is less distinct than in *E. baltica*.

The male genitalia of *E. baltica* most closely resemble those of *E. freyerella* and *E. stabilella*. However, *E. baltica* differs from the former by having vinculum gradually tapering into stout saccus that is often about twice as wide as the width of aedeagus (the width about half of the length); vinculum of *E. freyerella* is often tapered rather abruptly into long, slender saccus (Fig. 11a). Nevertheless, saccus shows a great variability in shape, especially in *E. freyerella*, perhaps partly due to geographic variation. For this reason, its shape is not always a good diagnostic feature, and the above-mentioned external characters should be used to differentiate these elachistids. From *E. stabilella*, *E. baltica* can be separated by the shape of aedeagus: it is bent from caecum to apex. The aedeagus of *E. stabilella* is almost straight, and only its short apical part is slightly curved (Fig. 11b). *E. consortella*, on the other hand, differs from *E. baltica* mainly having smaller distal spine of sacculus, shorter, thicker and basally straight aedeagus, smaller lobe of caecum, as well as distinctly shorter saccus (Fig. 11c). The aedeagus of *E. exactella* is meandering in shape, with clearly curved apical part, and it also has more slender saccus (Fig. 11d).

In females, all the above-mentioned taxa are difficult to distinguish based solely on fore wing patterns. Rough diagnosis of these moths can be made merely on the basis of head and neck tuft colouration (see the males above). However, the only certain way of their separation is to study the

Fig. 10. Habitat of *Elachista baltica* in Poland – Unieście at the Baltic Sea.

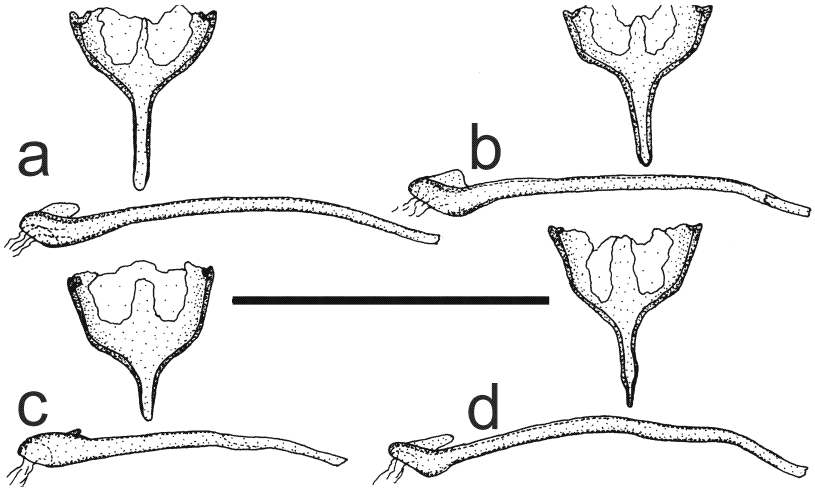

Fig. 11. Male genitalia of species of the *freyerella* species-group – vinculum with saccus (upper) and aedeagus (lower) (scale bar 0.5 mm).– a. *Elachista freyerella*. – b. *Elachista stabilella*. – c. *Elachista consortella*. – d. *Elachista exactella*.

genitalia, especially in case of *E. baltica* and *E. stabilella*, because both species possess more or less whitish head and neck tufts.

Like in males, the female genitalia of *E. baltica* are most similar to those of *E. freyerella* and *E. stabilella*. From *E. freyerella* it can be distinguished by smaller signum, central part of which is circular in shape (very often this part is situated somewhat posteriorly in relation to the half of corpus bursae length), usually more elongated shape of corpus bursae, and more "smooth" lateral walls of antrum-colliculum complex. The female of *E. freyerella* has a larger signum: the ratio of the length of corpus bursae to the length of the signum is on average 4.9 (n = 10, min. 4.3, max. 5.7). The central part of signum in this species is oval (in dorsal view), more or less elongated, and frequently placed somewhat anteriorly in relation to the half of length of corpus bursae. Corpus bursae in *E. freyerella* is usually pear-shaped, and the antrum is plainly swollen in some points (Fig. 12a).

It must be emphasized that some of the above-mentioned characters (shape of corpus bursae, shape of complex of antrum-colliculum, length of signum) express some degree of variability, especially in *E. freyerella*. Therefore they may create some problems in separation of *E. baltica* and *E. freyerella*. In questionable cases, the best diagnostic feature for these species seems to be the shape of the central part of signum. Corpus bursae and signum of *E. stabilella* more resemble those of *E. baltica* than those of *E. freyerella*. The female is characterized by the shape of antrum that is clearly swollen and rather abruptly tapered into colliculum compared to *E. baltica* (Fig. 12b). On the other hand, the females of *E. consortella* and *E. exactella* are distinguishable from those of *E. baltica* mainly in the following characters: *E. consortella* has smaller signum, longer, slender colliculum, and bell-shaped antrum (Fig. 12c),

Fig. 12. Female genitalia of species of the *freyerella* species-group – complex of antrum-colliculum-corpus bursae (scale bar 0.5 mm). A = signum (dorsal view). – a. *Elachista freyerella*. – b. *Elachista stabilella*. – c. *Elachista consortella*. – d. *Elachista exactella*.

while *E. exactella* possesses wider antrum, which ventral margin is narrowly V-shaped (Fig. 12d).

A comparison of larvae of *E. baltica* with other species is limited owing to an insufficient knowledge of detailed morphology of immature stages of Elachistidae. Yet, a few differences between species of the *freyerella* species-group may be outlined. Larvae of *E. baltica* are superficially similar to those of *E. freyerella*, but they may be recognized by having elongated and well-sclerotized anal shield (Fig. 6a). *E. freyerella* usually does not possess an anal shield, but if the shield is present, it is just a small, irregular plate situated between most dorsal setae (T. Baran, unpublished). From other described larvae of the group, *E. baltica* can be separated by having darker head and thoracic shield. In *E. stabilella* these shields are pale brownish, and yellowish in *E. consortella* (Bland 1996).

The chaetotaxy of *E. baltica* is characterized by some interesting features. Although these features concern, first of all, simply reduction of the body setae, they may have significance in phylogenetic studies, and may be especially useful in the so-called ingroup (within the family) comparisons. The following characters may be autapomorphies for the *freyerella* species group (all have been found in larvae of *E. freyerella*, too):

1. On thoracic segments 1–2, MV2 distinctly remote from other setae of MV group, close to V1. Here this seta has been designed as MV2, but it may also be a secondary one, because the absence of MV2 has been observed in larvae of *Elachista nolckeni* Šulcs, 1992 (Baran 2002);
2. On thoracic segments 1–2, SD2 absent.
3. Abdominal segments VIII–IX without SV setae.
4. On abdominal segment IX, proprioreceptor MD1 absent.

Also *E. baltica* possesses a character that may be one of the larval synapomorphies for the family Elachistidae (Baran 2002): on abdominal segments I–VIII, seta SD2 is placed far away from SD1.

Regarding the species' habitat associations, *E. baltica* appears to have different ecological requirements than *E. freyerella* and *E. stabilella*. In the studied habitats, the two latter mentioned elachistids have not been found flying together with *E. baltica*, and at least *E. freyerella* and *E. baltica* are ecologically allopatric in Poland. *E. stabilella* has also been collected in coastal sites in Denmark, but it occurs in habitats with clay soil with, among others, *Festuca arundinacea* Schreber – a probable food plant of this species (O. Karsholt, pers. comm.).

As for larval food-plant specialization of the elachistids belonging to the *freyerella* species group, a reliable confrontation is currently impossible due to many published, erroneous or uncertain host-plant records. It may be stated, however, that apart from *E. baltica* no species of the group has so far been reared from *Festuca rubra* ssp. *arenaria* (Obs.) Syme. On the other hand, an important problem that needs further studies deals with *Koeleria macrantha* as a host plant. Firstly, in Hering's collection (MIZP), labels under some reared specimens of *E. freyerella* bear only generic name of "*Koeleria*" sp., while those of *E. baltica* bear also species name – "*Koeleria cristata*" auct. (= *Koeleria macrantha*). Thus, there is doubt if both elachistids have been reared from the same grass species. Secondly, the authors have not found *Koeleria macrantha* in the studied localities, and generally this grass is very rare at Polish Baltic shore. Therefore, it is not unlikely that Hering's data are based on uncertain grass determination. *Koeleria*-grass determined by Hering as *Koeleria cristata* is treated here as *K. macrantha*. Nevertheless, *Koeleria glauca* (Schrader) D.C. also occurs at the Polish Baltic Sea. Thus, *E. baltica* might well be reared actually from Blue Hair-grass too.

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References

Baran, T. 2002: *Elachista nolckeni* Šulcs, 1992: morphology and bionomics of immature stages (Gelechioidea: Elachistidae). — Nota lepidopterologica 25 (2/3): 97–107.

Bland, K. P. 1996: Elachistidae. — In Emmet, A. M. (ed.), The moths and butterflies of Great Britain and Ireland, Vol. 3, Yponomeutidae–Elachistidae: 339–410. Harley Books, Colchester, Essex.

Hasenfuss, I. 1980: Die Präimaginalstadien von *Thyris fenestrella* Scopoli (Thyridodae, Lepidoptera). — Bonner Zoologische Beitrage 31: 168–190.

Hering E. 1891: Ergänzungen und Berichtigungen zu F. O. Büttner's Pommerschen Mikrolepidopteren. — Stettin. Ent. Ztg. 52: 135–227.

Hinton, H. R. 1946: On the homology and nomenclature of the setae of lepidopterous larvae with some notes on the phylogeny of the Lepidoptera. — Transactions of The Royal Entomological Society of London 97: 1–35.

Kaila, L. 1999a: Phylogeny and classification of the Elachistidae s.s. (Lepidoptera: Gelechioidea). — Systematic Entomology 24: 139–169.

Kaila, L. 1999b: A revision of the Nearctic species of the genus *Elachista* s. l. III. The *bifasciella*, *praelineata*, *saccharella* and *freyerella* groups (Lepidoptera, Elachistidae). — Acta Zoologica Fennica 211: 1–235.

Traugott-Olsen, E. & Nielsen, E. S. 1977: The Elachistidae (Lepidoptera) of Fennoscandia and Denmark. — Fauna Entomologica Scandinavica 6: 1–299.