

THREE NEW SPECIES OF *ELACHISTA* TREITSCHKE (LEPIDOPTERA: ELACHISTIDAE) FROM CENTRAL ASIA

Virginijus SRUOGA

Department of Zoology, Vilnius Pedagogical University, Studentų 39, 2034 Vilnius, Lithuania. E-mail: sruogavir@vpu.lt

Abstract. Three new species of *Elachista* Treitschke (*E. gerasimovi* sp. n., *E. purella* sp. n., *E. puplesisi* sp. n.) are described from Uzbekistan, Kazakhstan and Turkmenistan (Central Asia). The external features and genitalia are described and figured in detail. The type localities are mapped.

Key words: Elachistidae, *Elachista*, new species, Central Asia

INTRODUCTION

The Elachistidae fauna of Central Asia has been extremely poor known for a long time, and it is from the last decade only that the investigations have become more intense. This is the next from the series of the articles appeared in the last decade dealing with the Elachistidae of Central Asia. A short historical review of the investigations has been provided earlier (Sruoga, 1990; Sruoga & Puplesis, 1992; Sruoga & Puplesienė, 1998).

In the course of the study of the Elachistidae material from the Zoological Institute of the Russian Academy of Sciences (St. Petersburg) three new species of genus *Elachista* Treitschke, 1833, were revealed. Biologies of the new species are unknown.

MATERIAL AND METHODS

The terminology used for morphological structures mostly follows that of Traugott-Olsen & Nielsen, 1977. The appearance of moths was studied with stereo microscope MBS-10. The forewing length was measured from the base of the wing to the end of its terminal cilia. The wingspan was indicated as a double forewing length summarised with the thorax width. The genitalia slides have been prepared largely using the methods described by G.S. Robinson (1976) and E. Traugott-Olsen & E.S. Nielsen (1977). The illustrations of imagoes have been made by Mrs. Birutė Noreikienė (VPU) and the rest ones by the author of the article. The line figures of genitalia have been prepared using microscope Biolam and drawing apparatus RA-4. The genitalia of *E. gerasimovi* sp. n. and *E. puplesisi* sp. n. were examined and drawn in glycerol, before mounting in Euparal. The

genitalia of the rest species was examined and figured in permanent mount. Aedeagus in male genitalia are shown separately from the genital capsule to reduce overlapping of morphological structures in the juxta region.

The material has been collected by few Russian entomologists and originates from the following localities:

1. Uzbekistan, Kashkadar'inskaya Oblast, Kitab, 39°08'N, 66°46'E (Fig. 1a);
2. Kazakhstan, Karaganda Region, Koksengir, 49°11' N, 71°45'E (Fig. 1b);
3. Turkmenistan, Karakumy desert, Repetek, 38°36' N, 63°11'E (Fig. 1c).

The locality names have been spelled according to the Times Atlas of the World (Concise edition, 1994).

Abbreviations of institutions:

BMNH – The Natural History Museum, London, U.K.
VPU – Vilnius Pedagogical University, Lithuania
ZIRAS – Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia

RESULTS

Elachista gerasimovi sp. n.

Elachista gleichenella (Fabricius, 1781): Gerasimov, 1930: 41.

Type material. Holotype: ♀, Uzbekistan, Kashkadar'inskaya Oblast (SE Bukhara), Kitab, 15 06 1926, A.M. Gerasimov leg. (labelled in Russian), genitalia slide VS 166 (ZIRAS).

Female (Fig. 2). Forewing length 4.2 mm, wingspan 9 mm. Head, thorax and tegulae leaden grey with golden sheen. Labial palpi slightly curved, white with weak metallic sheen above and brownish below. An-

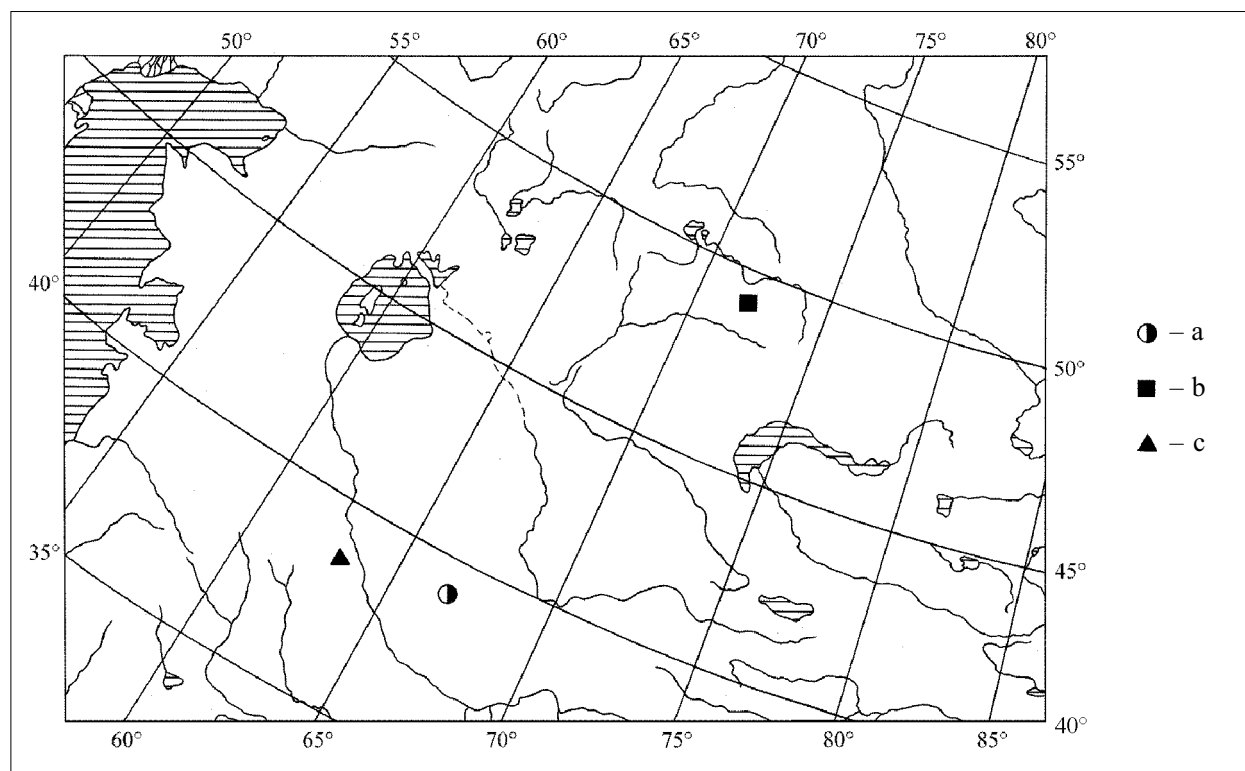


Figure 1. Distribution map: a – *Elachista gerasimovi* sp. n., b – *E. purella* sp. n., c – *E. puplesisi* sp. n.

tenna unicolorous dark brown with bronze sheen except last segment which is white; distal part of flagellum slightly serrated. Forewing dark brown with bronze lustre, marks golden shining. Basal spot reaching costal margin and broadened towards dorsum. Medial fascia wide and slightly oblique, width as 1/2 of its length. Distal fascia wide, only slightly bent towards apex of wing and narrowed near costal margin. Cilia brownish grey, cilia line blackish brown. Hindwing greyish brown, paler in basal part; its cilia of same colour.

Male. Unknown.

Female genitalia (Figs. 3-5). Papillae anales very short, setose. Tips of some setae hooked; these setae distinctly longer than remaining ones. Distal part of eighth tergite bears large tuft of enormously long setae (apparently longer than papillae anales), many of them hooked ventrad (Fig. 4). Scales on distal part of seventh tergite very long and slender. Apophyses posteriores about twice longer than anteriores. Ostium round; its anterior margin strongly sclerotized and slightly extended caudally, therefore ostium looks oval when ventrally viewed (Fig. 5). Characteristic W-shaped sclerotization on eight sternite situated caudally from ostium. Small sclerotization occurs inside antrum. Colliculum short and membranous, strongly spined. Remaining part of ductus bursae very long, membranous, only in posterior part with some very weakly

sclerotized folds. Corpus bursae with minute internal spines. Signum large and thorny, slightly bent (Fig. 3).

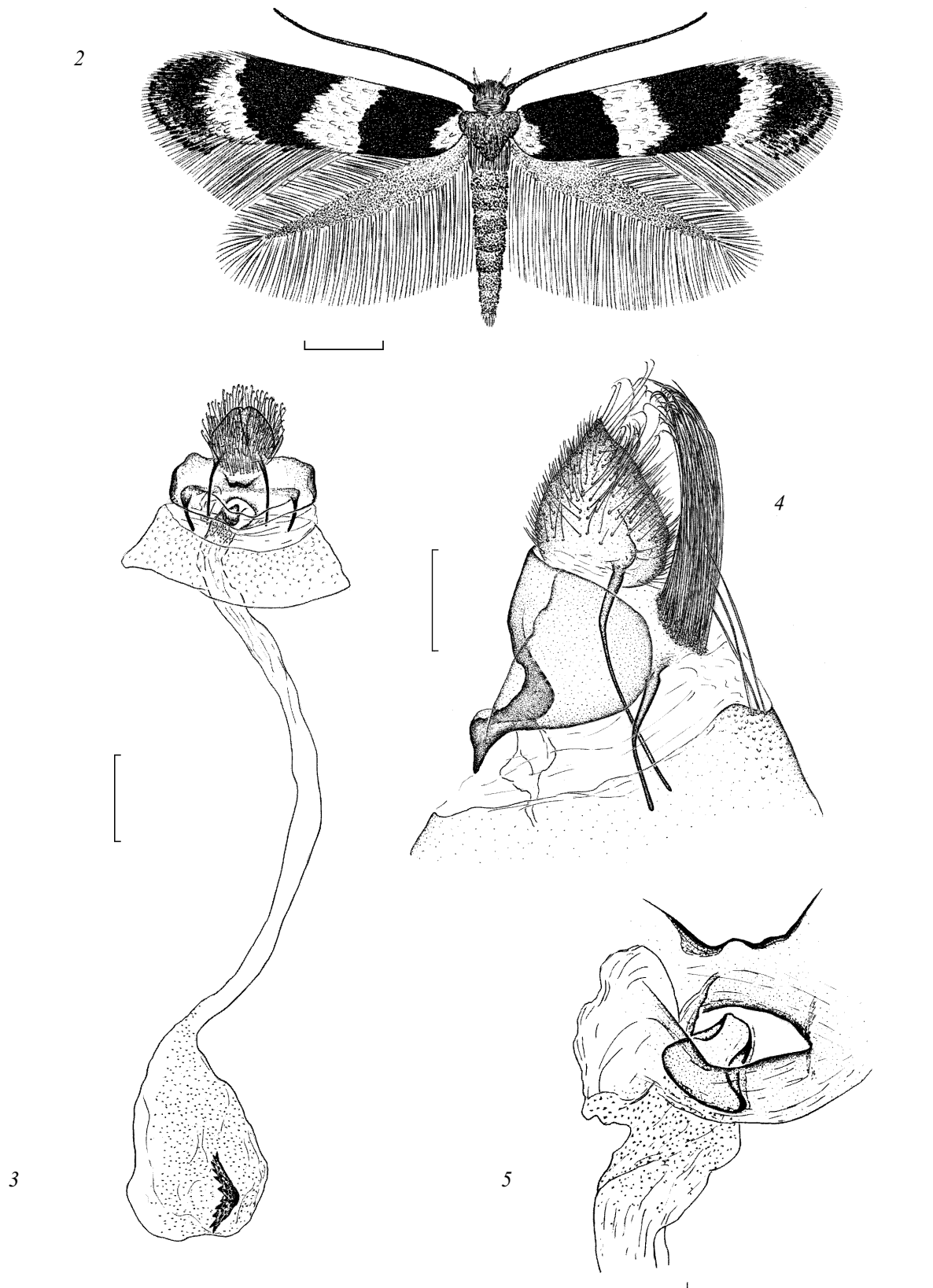
Diagnosis. The new species belongs to the *E. gleichenella* group sensu E. Traugott-Olsen & E.S. Nielsen (1977). Within the group, it is superficially distinguishable by the broad medial fascia of the forewing (Fig. 2). In female genitalia the new species differs from all other described species of the group by denser and conspicuously longer setae on distal margin of the eighth tergite, moreover, the tips of many these setae are hooked (Fig. 4). In addition, it is distinguished by the eighth sternite with characteristic W-shaped sclerotization caudally from ostium. The new species is mostly close to *E. gleichenella* (Fabricius, 1781), the differences are listed in Table 1.

Etymology. This species is named in honour of famous Russian entomologist A.M. Gerasimov who has collected the holotype.

Note. The Gerasimov's record (1930: 41) considering *E. gleichenella* (Fabricius, 1781) in Central Asia is based on misidentification of *E. gerasimovi* sp. n.

***Elachista purella* sp. n.**

Type material. Holotype: ♂, Kazakhstan, Karaganda Region, Koksengir, 40 km N Zhana-Arka, 14 06 1958, A.K. Zagulyaev leg. (labelled in Russian), genitalia slide VS 149 (ZIRAS).

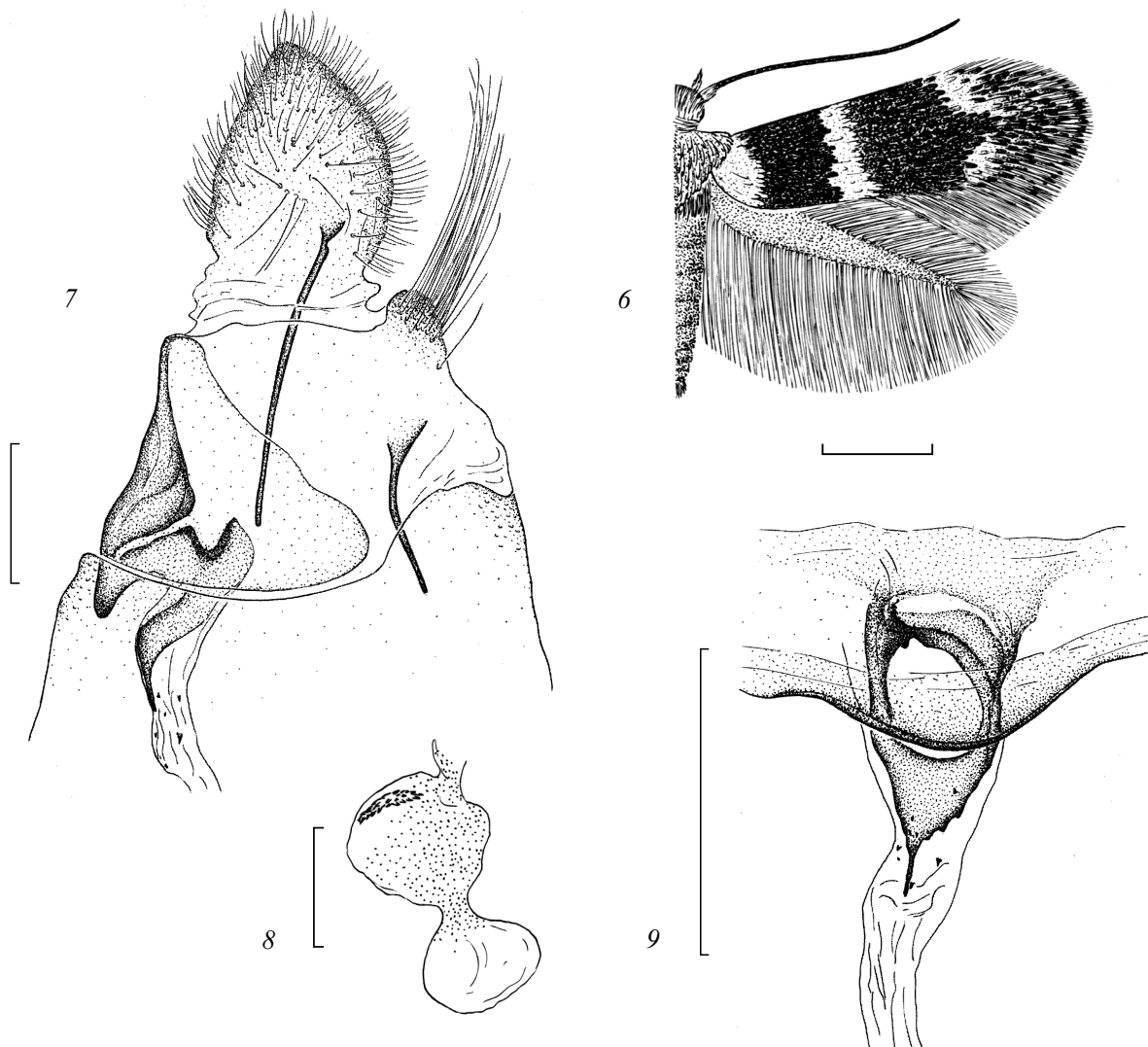


Figures 2-5. *Elachista gerasimovi* sp. n., holotype, female: 2 – general view (scale bar 1 mm); 3 – genitalia, general view (scale bar 0.4 mm); 4 – terminal part of genitalia, lateral view; 5 – ostium bursae, colliculum and part of sterigma (scale bar 0.1 mm)

Table 1. Main differences between *E. gleichenella* and *E. gerasimovi*

Character	<i>E. gleichenella</i>	<i>E. gerasimovi</i>
Medial fascia of forewing	Narrow (Fig. 6)	Broad (Fig. 2)
Costal and tornal spots	Either separated or confluent into the outwardly pointed fascia	Confluent into the fascia which is not pointed outwardly
Anterior margin of 8th tergite	Strongly sclerotized and convex (Fig. 9)	Less sclerotized and less convex (Fig. 5)
Colliculum	Dorsally sclerotized, with few teeth (Figs. 7, 9)	Membranous and strongly spined (Figs. 3, 5)
Corpus bursae copulatrix	Constricted ¹ (Fig. 8)	Not constricted (Fig. 3)

¹ This character of *E. gleichenella* was ignored by Traugott-Olsen & Nielsen, 1977, but correctly shown in Kaila & Biesenbaum, 1995: fig. 13, and also justified by our material of *E. gleichenella*: 1 ♀, Russia, Primorskiy Kray, 20 km E Ussuriysk, Gornotaezhnoe, 6-12 08 1985, S. Sinev leg. (ZIRAS); 1 ♀, Ukraine, Crimea, Karadag, 4 08 1987; 1 ♀, same locality, 13 07 1987 (Figs. 6-9), R. Puplesis leg. (VPU).

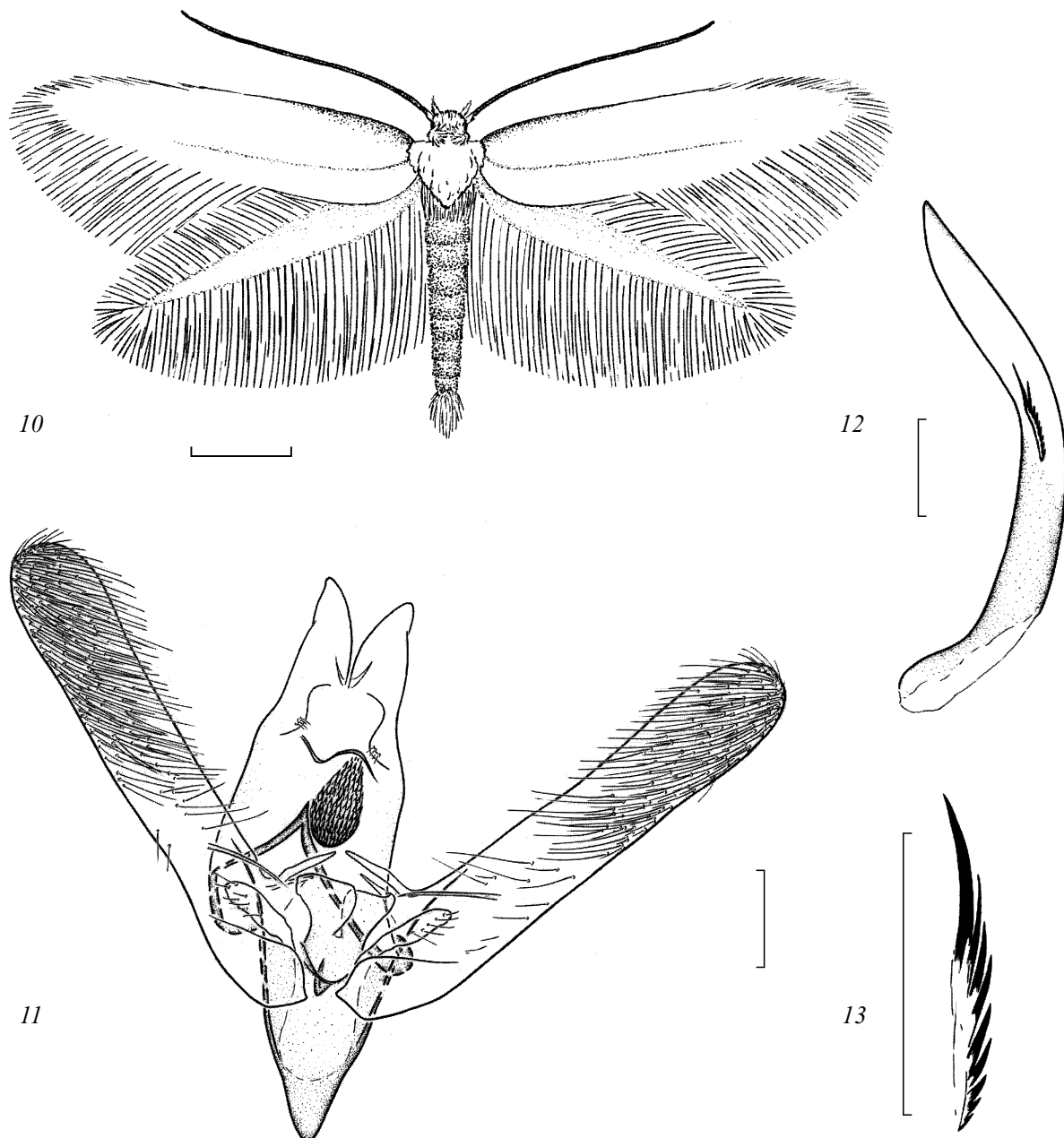


Figures 6-9. *Elachista gleichenella* (F.), female: 6 – general view (scale bar 1 mm); 7 – genitalia, terminal part, lateral view; 8 – corpus bursae copulatrix; 9 – ostium bursae and colliculum (scale bar 0.1 mm)

Male (Fig. 10). Forewing length 4.1 mm, wingspan 8.7 mm. Head: frons and neck tuft white, vertex with very weak beige tinge; labial palpi white but light beige in basal part from underside; antennal scape, pecten and few basal segments white, remaining part of flagellum brown, covered by very thin whitish scales. Thorax, tegulae and forewing white, cilia same, underside light brown. Hindwing white, with very weak beige tinge, cilia and underside white.

Female. Unknown.

Male genitalia (Figs. 11-13). Uncus lobes wide basally, tapering to pointed apices, medial margin gradually curved outwards. Gnathos distinctly drop-shaped, broadened apically. Vinculum with reinforced lateral margins, gradually narrowed into short and wide saccus. Valva long and narrow, widened at very base only. Juxta lobes narrow at base, medial margin slightly convex, apical margin almost straight, no setae presented.



Figures 10-13. *Elachista purella* sp. n., holotype, male: 10 – general view (scale bar 1 mm); 11 – genitalia, aedeagus removed; 12 – aedeagus; 13 – cornuti (scale bar 0.1 mm)

Table 2. Main differences between *E. bigorrensis*, *E. dispilella*, *E. distigmatella* and *E. purella*

Character	<i>E. bigorrensis</i>	<i>E. dispilella</i>	<i>E. distigmatella</i>	<i>E. purella</i>
Forewing	Spotless	With 2 black-brown spots	With 2 dark brown spots	Spotless
Gnathos	Wide-oval	Wide-oval	With parallel margins	Drop-shaped
Juxta process	Long and bottle-shaped	Short and simply shaped	Short and simply shaped	Short and simply shaped
Saccus	Slender	Wide	Slender	Wide
Aedeagus length	Almost equal to valva	Almost equal to valva	Almost equal to valva	Shorter than valva
Cornuti	8-9; the first four cornuti very large, the 2nd and 4th cornuti are probably the largest, remaining ones evidently smaller ²	5-6; gradually increasing in size towards apex of aedeagus	7-8; three large and 4 or 5 small ones	9; gradually increasing in size towards apex of aedeagus

² In the original description of *E. bigorrensis* concerning cornuti (slide no. 24886 BMNH) E. Traugott-Olsen (1990: 58) wrote: 'one large separate cornutus and a conglomeration of 7-8 smaller cornuti on a common base and a multitude of spines along the conglomeration'. However, R. Puplesis, having checked the same slide, noted: 'the first four cornuti are very large, remaining 4-5 ones are in the conglomeration and are evidently smaller' (Puplesis, pers. comm.)

Digitate process club-shaped, with some long setae apically. Sac-shaped process of juxta short and strongly sclerotized. Aedeagus strongly curved, slightly tapering, apex pointed, 9 relatively small cornuti on common base increasing in size towards apex of aedeagus (Figs. 12, 13).

Diagnosis. This species belongs to the *E. dispilella* complex sensu E. Traugott-Olsen (1990). It is similar to *E. bigorrensis* Traugott-Olsen, 1990 (compared with paratype slide no. 24886, BMNH, and Traugott-Olsen, 1990: figs. 57, 75), *E. dispilella* Zeller, 1839 (compared with lectotype slide no. 19364, BMNH, and Traugott-Olsen, 1990: figs. 42, 43, 64) and *E. distigmatella* Frey, 1859 (compared with lectotype slide no. 19395, BMNH, and Traugott-Olsen, 1990: figs. 45-48, 65). The differences are summarised in Table 2.

Etymology. *Purus* (Latin adjective meaning clean, spotless) refers to the white and spotless appearance of the moth.

Elachista puplesisi sp. n.

Type material. Holotype: ♂, Turkmenistan, SE Karakumy (desert), Repetek Biosphere Reserve, 30 03 1983, collected on grass, V.A. Krivokhatskii leg. (labelled in Russian), genitalia slide VS 167 (ZIRAS).

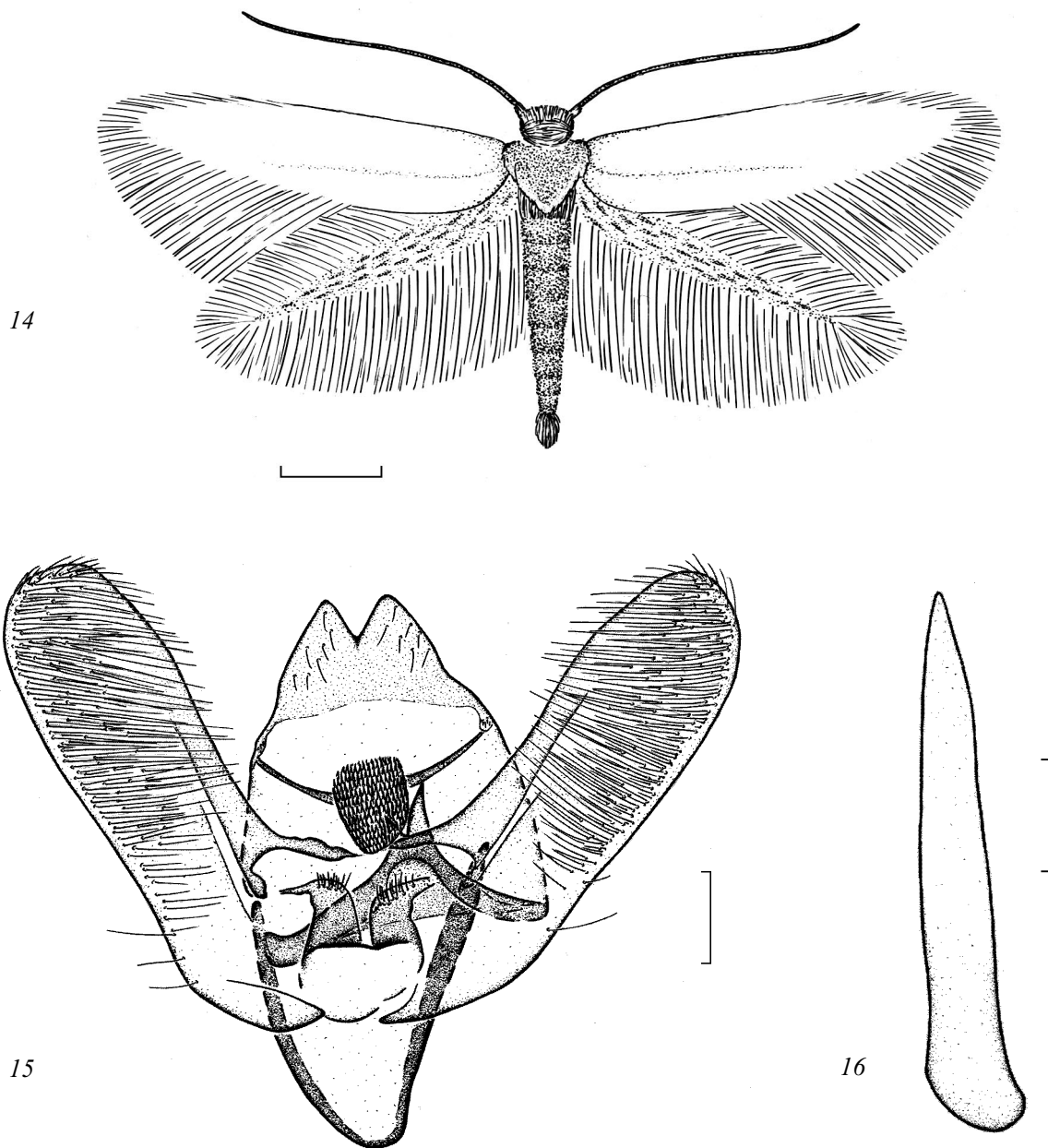
Male (Fig. 14). Forewing length 4.1 mm, wingspan 9 mm. Head: frons and neck tuft white with some grey brownish scales; labial palpi rather short and drooped; antennae brown, sparsely covered by whitish scales. Thorax and tegulae white, anterior part of tegulae greyish. Forewing white, with very weak yellowish tinge, cilia greyish white. Hindwing whitish, weakly mottled by brownish scales.

Female. Unknown.

Male genitalia (Figs. 15, 16). Uncus strongly sclerotized, lobes short, triangularly-shaped, sparsely setose, indentation between lobes small, V-shaped. Tegumen short and wide, anterior margin extremely strongly sclerotized into rather broad band. Gnathos large, elongated,

Table 3. Main differences between *E. bromella* and *E. puplesisi*

Character	<i>E. bromella</i>	<i>E. puplesisi</i>
Cucullus	Pronounced	Not pronounced
Indentation of uncus	Large	Small
Uncus lobes	With dense and long setae	With few sparse and short setae



Figures 14-16. *Elachista puplesisi* sp.n., holotype, male: 14 – general view (scale bar 1 mm); 15 – genitalia, aedeagus removed; 16 – aedeagus (scale bar 0.1 mm)

attached to tegumen by long reinforced arms. Vinculum V-shaped, without distinct saccus. Lateral margins of vinculum very strongly sclerotized. Valva short and wide, cucullus rounded, not pronounced; transtilla reinforced. Juxta with deep and broad incision, lobes apically rounded and with some short setae; lateral processes long and narrow. Digitate process absent. Aedeagus wide at base, tapering, apex pointed; no cornuti presented.

Diagnosis. Externally characterised by the white appearance and brownish mottled hindwing. Male genitalia exhibit an evident distinction of the new species.

It is just a little similar to *E. bromella* Chrétien, 1915 (Parenti, 1972: figs. 3 a-d). The essential differences are listed in Table 3.

Etymology. This species is named in honour of Prof. Rimantas Puplesis who has studied Microlepidoptera of Central Asia.

Remarks. This quite outstanding species is likely to represent a separate species group within *Elachista*, or even a new genus. However, as only a single specimen is known from this taxon, I prefer to abstain from systematical decisions.

ACKNOWLEDGEMENTS

I am greatly indebted to Dr Sergei Yu. Sinev (ZIRAS) for providing material for this study. I am also grateful to Prof. Rimantas Puplesis (VPU) for his help in checking some type material deposited at the BMNH. Mrs. Birutė Noreikienė (VPU) is acknowledged for providing the illustrations of the imagoes for this paper.

REFERENCES

- Gerasimov A. 1930. Zur Lepidopteren-Fauna Mittel-Asiens. I. Microheterocera aus dem District Kaschkadaria (SO-Buchara). *Ann. Mus. Zool. Acad. Sci. URSS* 31 (1): 21-48.
- Kaila L., Biesenbaum W. 1995. Redescription of *Elachista differens* Parenti, 1978 (Lepidoptera, Elachistidae). *Nota lepid.* 17 (3/4): 113-119.
- Parenti U. 1972. Revisione degli Elachistidi (Lepidoptera, Elachistidae) paleartici. I. - I Tipi di Elachistidi del Museo di Storia naturale di Parigi. *Boll. Mus. Zool. Univ. Torino* 2: 29-56.
- Robinson G.S. 1976. The preparation of slides of Lepidoptera genitalia with special reference to the Microlepidoptera. *Entomologist's Gaz.* 27: 127-132.
- Sruoga V. 1990. Seven new species of Elachistidae (Lepidoptera) from the USSR. *Tijdschr. ent.* 133 (1): 75-84.
- Sruoga V.A., Puplesis R.K. 1992. New species of gramineal elachistid moths (Lepidoptera, Elachistidae) from Middle Asia and Kazakhstan. *Ent. Obozr.* 71 (2): 428-441 (in Russian).
- Sruoga V., Puplesienė J. 1998. Contribution to the knowledge of Central Asiatic Microlepidoptera with description of new species. *Acta Zoologica Lituanica. Entomologia* 8 (3): 38-48.
- Traugott-Olsen E. 1988. The *Elachista triseriatella* Stainton complex, with descriptions of eight new species (Lepidoptera: Elachistidae). *Entomologist's Gaz.* 39: 293-311.
- Traugott-Olsen E. 1990. The *Elachista dispilella* Zeller complex, with descriptions of ten new species (Lepidoptera: Elachistidae). *Entomologist's Gaz.* 41: 35-68.
- Traugott-Olsen E., Nielsen E.S. 1977. The Elachistidae (Lepidoptera) of Fennoscandia and Denmark. *Fauna ent. scand.* 6: 1-299.

**TRYS NAUJOS *ELACHISTA* TREITSCHKE
(LEPIDOPTERA: ELACHISTIDAE) RŪŠYS
IŠ CENTRINĖS AZIJOS**

V. Sruoga

SANTRAUKA

Aprašytos trys naujos *Elachista* rūšys (*E. gerasimovi* sp. n., *E. purella* sp. n., *E. puplesisi* sp. n.) iš Uzbekistano, Kazachstano ir Turkmėnijos (Centrinė Azija). Pateikti detalūs visų rūšių išorės ir genitalinių struktūrų aprašymai bei piešiniai. Naujų rūšių tipinės vietovės pažymėtos žemėlapyje.