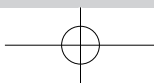
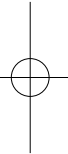
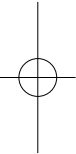
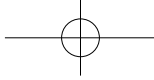


Eloeophila of the world

(Diptera, Limoniidae)





ELOEOPHILA OF THE WORLD

Published on November 13, 2023

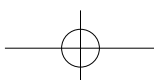
Published by National Institute of Biological Resources
Environmental Research Complex, 42, Hwangyeong-ro, Seo-gu, Incheon
22689, Republic of Korea
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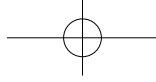
Publisher: National Institute of Biological Resources
Authors: Sigitas Podenas
Project Staff: Changmu Kim, Jinwhoa YUM, Neung-ho Ahn, Seon Yi Kim
Edited and designed by Doohyun Publishing Co. in Korea

ISBN: 978-89-0000-000-0 00000
Government Publications Registration Number: 11-0000000-000000-00

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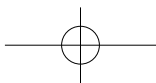
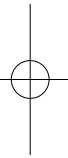
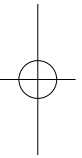
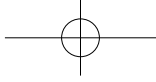




***Eloeophila* of the world**

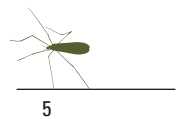
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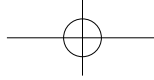
Sigitas Podenas



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ACKNOWLEDGEMENTS

Our warmest thanks to all Korean friends and colleagues who helped us during our visits to South Korea and all those who helped to collect crane flies. We are also very grateful to all researchers, museum curators and managers who helped us with the museum specimens, information, pictures and support, especially:

to Professor Dr. Yeon Jae Bae for the specimens from Korea University, Seoul, the Republic of Korea;

to Dr. Floyd Shockley and Dr. Torsten Dikow (USNM) and Dr. Jon K. Gelhaus (Academy of Natural Sciences of Drexel University, USA) for the possibility to use specimens from the USNM and Academy's collections;

to Jennifer Thomas for help with Korean specimens from the University of Kansas, USA;

to Dr. Justin Runyon for help with specimens from the Montana Entomology Collection at Montana State University;

Dr. Duncan Sivell for the possibility to use specimens from the Natural History Museum, London, United Kingdom;

Pasquale Ciliberti for the help with the specimens from the Naturalis biodiversity center, Leiden, Netherlands;

Dr. Daichi Kato, Echigo–Matsunoyama Museum of Natural Sciences, 'Kyororo', Tōkamachi, Japan for the specimens donated to the NRC and for permit to publish pictures of *Eloeophila hadrophallus*, we also acknowledge the copyright holder © Magnolia Press for these illustrations;

Dr. James Hogue for the specimens from California State University, Northridge, CA, USA;

Gardner Joel David for the information and image of *E. superlineata* wing from the Washington State University at Pullman, USA.

Mat Seidensticker, Northern Rockies Research & Educational Services, for the possibility to work and collect crane flies at the MPG Ranch, Missoula Co., Montana, USA;

Dr. Fenja Brodo for the specimens from her privat collection and help with the specimens from the Canadian National collection of Insects, Arachnids and Nematodes, Ottawa, Ontario, Canada;

Dr. Anne Freitag and Marion Podolak for the specimens and photographs of *Eloeophila* from the Cantonal Museum of Natural Sciences, Lausanne, Switzerland (Muséum cantonal des sciences naturelles, Etat de Vaud);

Dr. Willy Geiger, Dr. Christophe Dufour and Jessica Litman for the help with Swiss material and especially from the Natural History Museum, Neuchâtel, Switzerland;

to Stéphane Hanot for *Eloeophila* from Royal Museum for Central Africa, Tervuren, Belgium;

Dr. Jindřich Roháček for the specimens from Slezské zemské muzeum, Opava, Czech Republic;

Dr. Jaroslav Starý for many specimens and especially paratypes that he donated to the NRC, also for his permit to publish illustrations of *E. laciniata* and *E. maroccana*, we also acknowledge European Journal of Entomology for these illustrations;

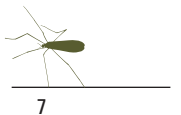
Dr. Andrew Fasbender, Invertebrate Taxonomist at Rhithron Associates Inc., USA for *Eloeophila* crane flies from the Western United States.

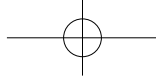
Special thanks are also extended to colleagues from the Nature Research Centre, Lithuania: to



Jonathan Stratford for correction of my English, Dr. Žilvinas Pūtys for the cover photograph, Nijolė Nasevičienė for help to arrange and to measure specimens and to Naukova Dumka Publishing House, Kiev, Ukraine, for the permit to reproduce illustrations of *E. verrucosa*, also to Dr. Jakaterina Havelka, Vilnius University, for her help with molecular phylogenetic analysis.

This research received support from the SYNTHESYS+ Project <http://www.synthesys.info/> which is financed by European Community Research Infrastructure Action under the H2020 Integrating Activities Programme, Project number 823827.





INTRODUCTION

Eloeophila Rondani, 1856 (Fig. 1) (Diptera, Limoniidae, Limnophilinae) is a medium-sized genus of crane flies with a total of 85 species worldwide (Oosterbroek, 2023). The genus has no recognized subgenera. Within the genus the most diverse is the Palearctic fauna with 33 species (20 species in the Western Palearctic and 15 in the Eastern Palearctic), while there are 20 species in the Nearctic Region, 23 species in the Oriental and nine in the Afrotropical Region. The genus is not present in the Australasian or Neotropical Regions. Three fossil species are described from the Eocene period: one species from Florissant deposits in Colorado (*E. scudleri* Santos, Klein, Ribeiro, 2022) and two from Baltic amber (*E. eocenica* Santos, Klein, Ribeiro, 2022 and *E. moba* Podenas, 2003).



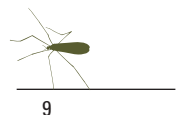
Fig. 1. General view of *Eloeophila apicata* female (photo by Žilvinas Pūtys).

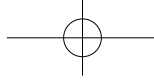


The wings of most species have intense patterning with abundant larger and smaller spots, most characteristically with seven larger spots along the frontal margin (Fig. 3A). Some variation in wing pattern can be observed in species with wider distribution areas, but usually the general pattern is preserved and allows species recognition. Many species have sexually dimorphic wings with males having wider wings with a distinctly extended posterior margin at the tip of the anal vein. The most obvious feature of *Eloeophila*, making it easily recognizable among other crane flies, is the supernumerary cross-vein in cell *bm*. This character occurs also in other Limnophilinae crane flies, thus at one time *Eloeophila* was placed within *Idioptera* Macquart, 1834, a northern genus with banded wings and long antennae. Such supernumerary cross-veins sporadically occur also in other Limnophilinae genera, such as *Epiphragma* (*E. (Parepiphragma) perideles* Alexander, 1960), *Dicranophragma* (*D. (s.str.) diploneura* (Alexander, 1956), *D. (s.str.) multiguttula* (Alexander, 1974)) and *Afrolimnophila* (*A. erhanae* Starý, Kolcsar, 2021). The supernumerary cross-vein in cell *bm* was considered as a synapomorphy shared between the genera *Eloeophila* and *Idioptera* by Ribeiro (2008), but this additional cross-vein is also known in other families of crane flies: Tipulidae, subfamily Tipulinae (genera *Leptotarsus (Pehlkea)* Enderlein, 1912 and *Keiseromyia* Alexander, 1963), Pediciidae (genera *Nasiternella* Wahlgren, 1904 and *Savchenkoiana* Kocak, 1981, subgenus *Dicranota (Polyangaeus)* Doane, 1900). However, as pointed out by Edwards (1938), the supernumerary cross-vein *m-cu* may, on rare occasion, be absent in one or both wings of some *Eloeophila* specimens and, in even more interesting specimens, there may be two supernumerary cross-veins *m-cu* (Fig. 3B).

Preimaginal stages are unknown for most species. Larvae are reported to live in mud beside streams or in moist soil, some are more often found at seepages (Stubbs, 2021).

This is the first attempt to gather all possible information on this genus and to document type specimens located in different museums across the world.





MATERIALS AND METHODS

Totally 1,250 specimens of *Eloeophila* crane flies were available for this study. They are preserved in these following scientific collections:

USNM	C.P. Alexander's Collection at the United States National Museum, the Smithsonian Institution, Washington DC, USA
ANSP	The Academy of Natural Sciences of Drexel University, Philadelphia, PA, USA
CSUN	California State University, Northridge, CA, USA
WSU	Washington State University at Pullman, WA, USA
CNC	The Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, Ontario, Canada
KU	Korea University, Seoul, South Korea
MCSN-VD	The Cantonal Museum of Natural Sciences, Lausanne, Switzerland (Muséum cantonal des sciences naturelles, Etat de Vaud)
Naturalis	Naturalis Biodiversity Center, Leiden, Netherlands
MHNN	The Natural History Museum, Neuchâtel, Switzerland
MTEC	Montana Entomology Collection, Montana State University, MT, USA
NHMUK	The Natural History Museum, London, the United Kingdom
NIBR	The National Institute of Biological Resources, Incheon, South Korea
NRC	The Nature Research Center, Vilnius, Lithuania
RMCA	The Royal Museum for Central Africa, Tervuren, Belgium
SMEK	The Snow Entomological Museum, University of Kansas, Lawrence, KS, USA
SMOC	Slezské zemské muzeum, Opava, Czech Republic
VU	The Zoological Collection of Vilnius University, Vilnius, Lithuania

Material was also obtained from the private collections of Dr. Fenja Brodo, Canada; Dr. Daichi Kato, Japan; Dr. Jaroslav Starý, Czech Republic; and Dr. Andrew Fasbender, USA.

Adult crane flies were collected in various ways, including by insect nets, with Malaise traps, LED light traps, black light traps, Mosquito Magnet® traps (Pro Model, Woodstream Corp., Lititz, PA), New Jersey traps and at light sources. Some specimens were preserved dry in envelopes in the field and were later mounted at the laboratory on their side on a paper point, with legs generally surrounding the insect pin. Other specimens were preserved in 96% ethanol (ETOH). Some specimens were slide-mounted in Euparal, with the genitalia of males and the ovipositors of females cleared overnight in approximately 10% potassium hydroxide (KOH) and preserved in microvials filled with glycerol on the same pin as the dry insect or on a separate pin if the crane fly was preserved in ethanol.

Information on the examined material is given as it is on the labels, except coordinates, altitudes and measurement units which are given in metric. Also given are any additional labels kept with the specimen or additional notes on the same label, such as "metatype" written by Dr. C.P. Alexander. For specimens collected by the author and his colleagues, the collecting date on the label is followed



by a number in brackets. Different localities where insects were collected on the same date were given separate numbers and all information from those localities, whether in the field notes, databases, photographs or any other locality information, was marked with this specific number. Non type specimens are arranged according to the collecting date.

Crane flies were observed using an Olympus SZX10 dissecting microscope. Photographs were taken with a Canon EOS R5 digital camera through a Canon MP-E 65 mm macro lens and through Mitutoyo M Plan Apo 10× and 20× lenses mounted on the same camera.

The terminology of adult morphological features generally follows that of Cumming and Wood (2017), while terminology of wing venation follows de Jong (2017) and terminology of structure of aedeagal complex follows Starý (2009).

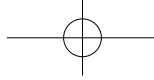
The general distribution of species is given according to Oosterbroek (2023).

Redescriptions are based on studied specimens and all available publications with special attention paid to original descriptions.

A phylogenetic tree was constructed based on the mitochondrial COI representing DNA barcoding region (658 bp) sequence data of all publicly available and our data of *Eloeophila*. Total genomic DNA was extracted from the abdomen or legs of each specimen using a QIAamp DNA Micro Kit (Qiagen, Hilden, Germany). Standard PCR amplification and sequencing protocols were used to generate COI fragment sequences. The target fragment of COI was amplified in 20 µL reactions containing AccuPower PCR PreMix (Bioneer Co., Daejeon, Korea), 1 U Top DNA polymerase, dNTPs (10 mM), Tris-HCl (pH 9.0), KCl (30 mM), MgCl₂ (1.5 mM), 3 µL (5–50 ng) template DNA, and 1 µL of each primer (LCO1490 and HCO2198; 10 pM each). Amplification was performed using the following thermal cycling program: 94 °C for 4 min; 35 cycles of 94 °C for 0.5 min; 48 °C for 0.5 min; 72 °C for 1 min; and a final extension at 72 °C for 10 min. PCR products were sequenced by Macrogen Inc., Korea.

Before further analysis, DNA sequences for each specimen were aligned in the BioEdit Sequence Alignment Editor. *Eloeophila* COI sequences were submitted to GenBank, and their accession numbers are OQXX – OQYY (Pl. 1). Maximum likelihood (ML) phylogenetic tree was computed with MEGA X software using all sites and Nearest-Neighbour-Interchange (NNI) heuristic search method with bootstrap test (1000 replicates). Best-fit model of evolution (GTR+G) was selected by the software jmodeltest 2.1.7. Genetic distances between examined species were calculated as proportion of differences (p-distances) as implemented in the program MEGA X. We used mitochondrial COI sequence of *Idioptera linnei* as an outgroup (GenBank accession number OQ404934).





TAXONOMY

Class Insecta Linnaeus, 1758

Order Diptera Linnaeus, 1758

Family Limoniidae, Rondani, 1856

Subfamily Limnophilinae Bigot, 1854

Genus *Eloeophila* Rondani, 1856

Type species: *Limnobia marmorata* Meigen, 1818 (= *maculata* (Meigen, 1804)) (Palearctic)

Eloeophila Rondani, 1856: 182–183; Savchenko, Krivolutskaya, 1976: 59; Savchenko, 1983: 50; 1986: 302–306; 1989: 81–82; Stubbs, 2021: 327–328; Podenas et al, 2020: 513–514;

Ephelia Schiner, 1863: 222; Lackschewitz, 1940: 72;

Trichephelia Alexander, 1938b: 73;

Limnophila (*Elaeophila*) Edwards, 1938: 77–78; Ishida, 1959: 2–3.

ADULT

Small to medium-sized crane flies with body length ranging from 3.2 mm to 11.2 mm. Males usually smaller than females. The smallest male with body length 3.2 mm and wing length 3.8 mm is found in *E. enischnophallus* from Japan, the smallest female with body length 4.2 mm and wing length 4.8 mm is *E. serotinella* from Eastern United States. The largest species is the widely spread Palearctic *E. maculata* with male body length reaching up to 9.0 mm and female 11.2 mm, wing length accordingly 10.0 mm and 11.2 mm. Body coloration varies from yellow to brown, gray and dark brown, often densely dusted with gray.

Head (Fig. 2). Rounded posteriorly without neck-like extension. Vertex wide without tubercle, or with very small and indistinct tubercle. Antenna with 14-segmented flagellum, usually longer in male, reaching frontal margin of prescutum, sometimes wing base, as an exception, extending beyond base of abdomen if bent backwards. Flagellomeres elongate, sometimes oval, especially in female, apical segment subequal in length to preceding. Often 4–6 basal flagellomeres enlarged on ventral side. Separate segments covered with dense whitish or grayish pubescence, denser on basal half of flagellum. Verticils long and distinct, usually about twice as long as respective segment. Rostrum short, palpus always curved downwards, palpomeres elongate, but comparatively short. Palpus of all *Eloeophila* species is typical for most Limoniidae crane flies, it has four discernible segments (palpomeres) and basal, completely reduced palpomere which is usually not considered by



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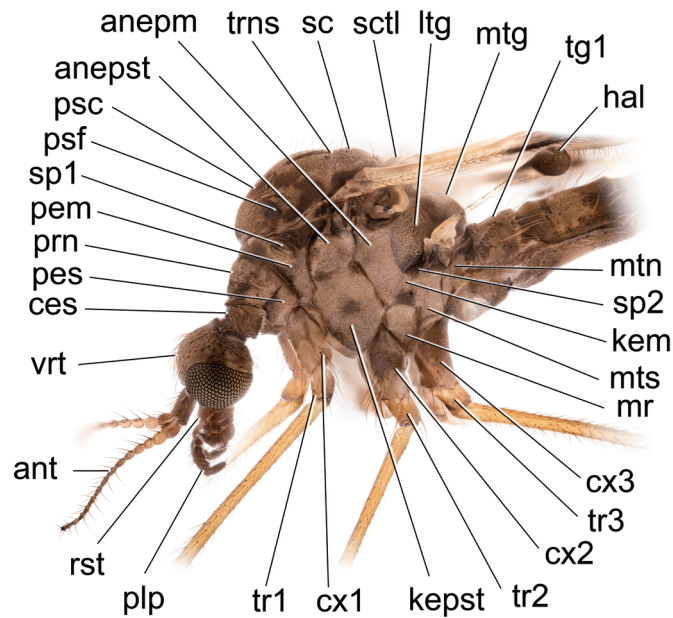


Fig. 2. Head and thorax of *Eloeophila maculata* female. Abbreviations: anepm – anepimeron; anepst – anepisternum; ant – antenna; ces – cervical sclerite; cx – coxa; hal – haltere; kem – katepimeron; kepst – katepisternum; ltg – laterotergite; mr – meron; mtg – mediotergite; mtn – metanotum; mts – metepisternum; pem – proepimeron; pes – proepisternum; plp – palpus; prn – pronotum; psc – prescutum; psf – pseudosutural fovea; rst – rostrum; sc – scutum; sctl – scutellum; sp1 – prothoracical spiracle; sp2 – postthoracic spiracle; tg1 – first abdominal tergite; tr – trochanter; trns – transverse suture; vrt – vertex.

dipterists. No species of *Eloeophila* has reduced one- or two-segmented palpus which occasionally occurs in other genera of Limoniidae.

Thorax (Fig. 2). Prothorax elongate, frontal margin nearly straight. Dorsum of prothorax often darkened or with distinct medial stripe. Mesonotal prescutum with small tubercular pits, pseudosutural fovea contrastingly polished black or brown. Prescutum and presutural scutum often with four longitudinal stripes and darkened lateral margin, sometimes uniformly colored without any darker spots or stripes. Pattern somewhat variable individually, but comparatively stable and can't be neglected for species identification. Scutal lobes concolorous with prescutum, usually marked with one or two darker spots, area between lobes usually paler, often with dark spot at posterior margin that extends onto scutellum making longitudinal medial stripe. Pleuron with bare katepisternum, meron distinct, thus middle and posterior coxae removed from each other. Wing (Fig. 3A) iridescent, long and narrow, usually with distinct pattern of many dark spots at frontal margin, less distinct spots around branching points of veins and at apices of longitudinal veins. *Arculus* present, vein *Sc* long, reaching wing margin close to the branching point of *Rs*, *sc-r* slightly before tip of *Sc*. *R*₁ short, longitudinal or oblique, *R*₃ and *R*₄ diverging. Cell *m*₁ long with long stem. Discal cell always present, elongate. Cell *bm* always with additional cross-vein, *m-cu* distinctly beyond base, usually from one-third to the middle of discal cell. Anal vein long, sinuous, reaching wing margin beyond the level



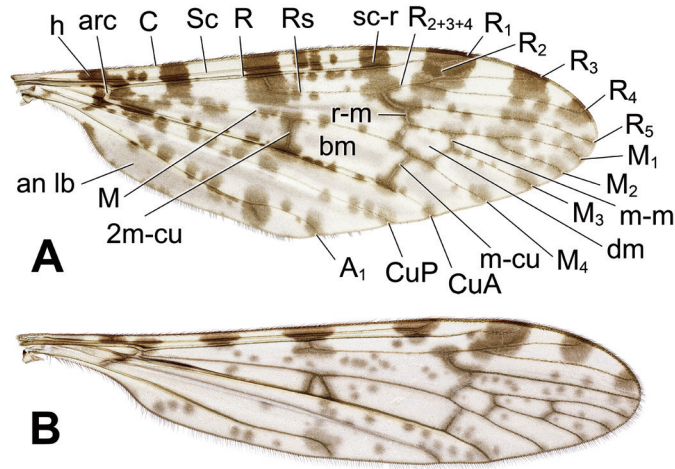


Fig. 3. Wing of *Eloephila* male. **A.** *E. maculata*. **B.** Aberrant wing of *E. aleator* with two supernumerary cross-veins *m-cu*. Abbreviations: *A*₁ – first branch of anal vein; *an lb* – anal lobe; *arc* – arcus; *bm* – basal medial cell; *C* – costal vein; *CuA* – anterior branch of cubital vein; *CuP* – posterior branch of cubital vein; *dm* – discal medial cell; *h* – humeral vein; *M* – medial vein, or media; *M*₁ – first branch of media; *M*₂ – second branch of media; *M*₃ – third branch of media; *M*₄ – fourth branch of media; *m-cu* – medial-cubital cross-vein; *2m-cu* – supernumerary medial-cubital cross-vein; *m-m* – medial cross-vein; *R* – radius, or radial vein; *R*₁ – anterior branch of radius; *R*₂ – second branch of radius; *R*₂₊₃₊₄ – stem of radial branches *R*₂, *R*₃ and *R*₄; *R*₃ – lower branch of second branch of radius; *R*₄ – upper branch of third branch of radius; *R*₅ – lower branch of third branch of radius; *r-m* – radio-medial cross-vein; *Rs* – radial sector; *Sc* – subcostal vein; *sc-r* – subcostal-radial cross-vein.

of *Rs* base. Anal angle wide, posterior margin widely rounded. Wing cells without macrotrichiae in most species, but some species have some macrotrichiae in distal cells. This feature is stable and could be used for species identification. Wing squama setoseless. Legs with tibial spurs, foreleg with single spur, middle and posterior legs with two spurs each.

Abdomen. Tergites with one pair of anterior transverse sutures that are less distinct than in some other Limnophilinae crane flies. Male terminalia (Fig. 4A) elongate, approximately as wide as the rest of abdominal segments. Epandrium (ninth tergite) wider than longer, posterior margin usually with wide, but shallow emargination. Gonocoxite elongate, without interbase, base often enlarged on ventro-mesal surface and armed with three to six small teeth. Two pairs of terminal elongated gonostyli. Outer gonostylus sclerotized, usually with large apical spine, outer margin often with large crest that stands at a right angle to the rest of gonostylus, thus hardly visible in directly dorsal view. Crest rounded in some species, but extended into long and strong spine in others, exception being *E. bifida* where crest extends into separate branch. Margin beyond crest often serrate. Inner margin of gonostylus usually straight and forming a near right angle with distal margin. Inner gonostylus simple, fleshy and setose, with darkened inner margin. Inner genitalia or aedeagal complex (Fig. 4B) comparatively small in most species, usually only about 0.2 mm wide. Paramere bifid in most species with medial branch long, blade-shaped, lateral branch short and blackened. Distal part of medial branch could be finely setose in some species. Very different paramere observed in *E. bifida*,



medial branch of which is strongly widened and arched. Both parameres usually reaching each other medially thus making genital bridge. Lower shelf sometimes rounded posteriorly, but in some species extends laterally or medially along aedeagus. Lateral apodeme elongate, blade or plate-shaped, usually darkened, especially at base. Aedeagus straight in dorsal view, but comparative length strongly varies among species, from very short, not extending beyond posterior margin of paramere to very long, as in *E. apicata*. The vesica or sperm pump subglobular or oval, bearing anterior apodeme, size and shape of which varies from very small in many species to large and fan-shaped in *E. apicata*. Lateral process of aedeagal sheath absent in *Eloeophila*. Ovipositor (Fig. 4C) with long and narrow cercus and hypovalva, distal part of cercus usually slightly raised upwards. Only *E. venaguttula* from South Africa has a completely different ovipositor with short fleshy valves.

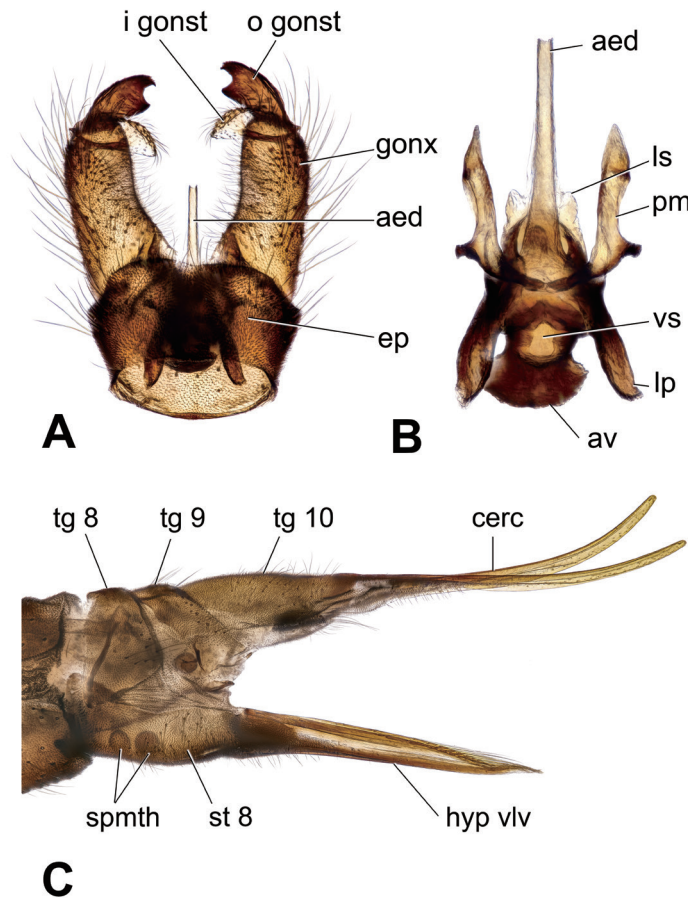
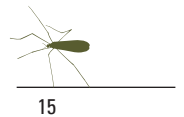


Fig. 4. Terminalia of *Eloeophila*. **A.** Male genitalia of *E. apicata*, dorsal view; **B.** Aedeagus (inner genitalia) of *E. apicata*, dorsal view; **C.** Ovipositor of *E. maculata*, lateral view. Abbreviations: aed – aedeagus; av – apodeme of vesica; cerc – cercus; ep – epandrium (ninth tergite); gonx – gonocoxite; hyp vlv – hypovalva; i gonst – inner gonostylus; lp – lateral apodeme; ls – lower shelf; o gonst – outer gonostylus; pm – paramere; spmth – spermatheca; st – sternite; tg – tergite; vs – vesica (spermal pump).



LAST INSTAR LARVA

Body (Fig. 5) covered with light brown pubescence, length up to 14 mm. Last abdominal segment (anal segment) constricted, penultimate inflate

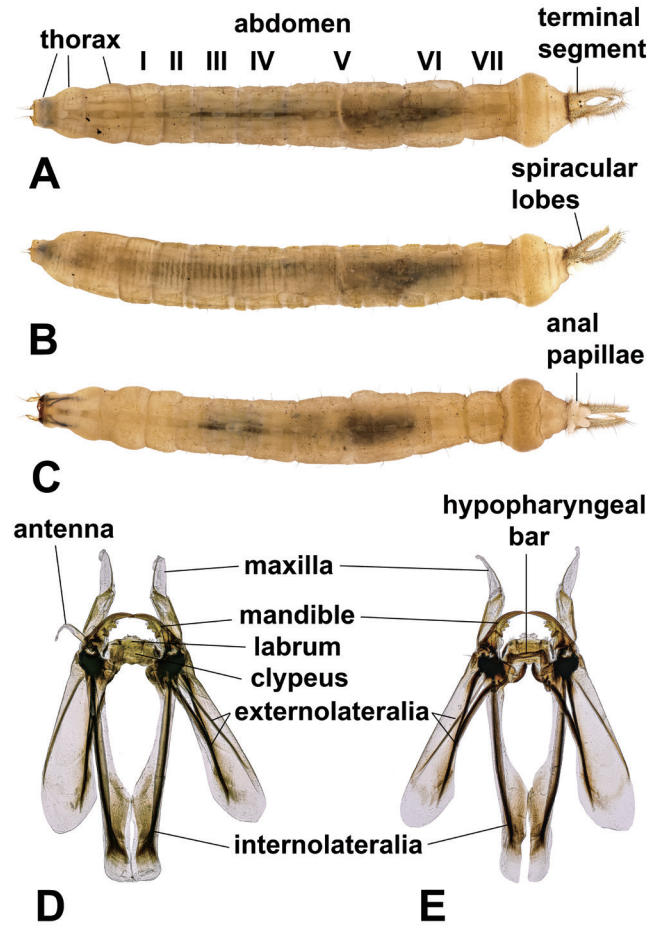


Fig. 5. Larva of *Eloephila maculata*. **A.** Dorsal view; **B.** Lateral view; **C.** Ventral view; **D.** Head capsule, dorsal view; **E.** Head capsule, ventral view.

Head capsule. Elongate-oval, depressed dorsoventrally and strongly reduced. Labrum trapezoid, sensory structures placed anteriorly. Clypeus distinctly divided from labrum, trapezoid, slightly sclerotized with a tuft of long setae anteriorly, with fissure separating lateral part into a prominent lobe. Frons reduced. Antenna elongated, longer than mandible, basal segment cylindrical with upper part directed outward, apical segment short and sculptured, placed subterminally. Mandible sickle-shaped, with a single sharp, curved apical tooth and a few prominent teeth at the base. Maxilla narrows toward the tip with apical part directed outward and elongate, fusion of inner and outer parts incomplete, basal part sclerotized, apex with sensory structures. Cardo reduced into small



sclerite. Ventral part of head capsule joined-up with the hypopharyngeal bar, consisting of two large lateral plates and a transversal bar. Labial palpus well developed. Posterior part of head capsule consists of one pair of internolateralia and two pairs of externolateralia, internolateralia wider than externolateralia.

Spiracular disc. Spiracular field surrounded by four cylindrical, elongate and pointed lobes. Dorsal lobe reduced and inconspicuous. Ventral pair of lobes longer or subequal to lateral pair. Spiracular lobes could be sclerotized or without sclerites. Spiracles small, circular and widely separated.

Anal field: Anus surrounded by four short, white and fleshy anal papillae.

PUPA

Length up to 12 mm. Body (Fig. 6) coloration brown. Head and thorax much darker than the rest of the body.

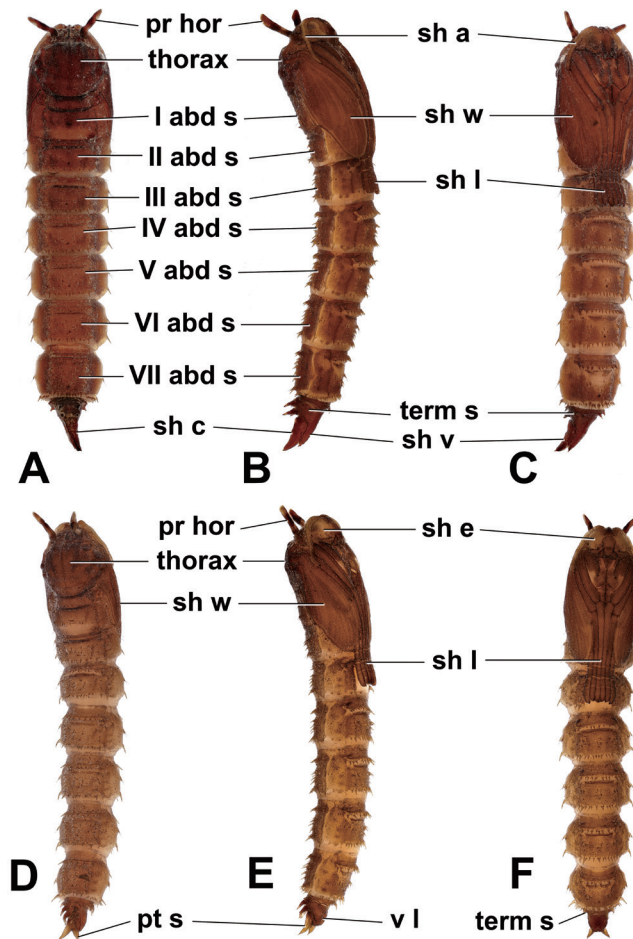
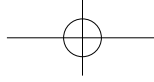


Fig. 6. Pupa of *Eloephila* sp. **A.** Female, dorsal view; **B.** Female, lateral view; **C.** Female, ventral view; **D.** Male, dorsal view; **E.** Male, lateral view; **F.** Male, ventral view. Abbreviations: abd s – abdominal segments (I–VII); pr hor – pronotal horn; pt s – posterotergal spine; sh a – sheath of antenna; sh c – sheath of cercus; sh e – sheath of eye; sh l – sheath of leg; sh v – sheath of valva; sh w – sheath of wing; term s – terminal segment; v l – ventral lobe.





Head. Cephalic crest inconspicuous, consisting of four unequal lobes. Antennal sheaths short, reaching one-third of wing length.

Thorax. Respiratory horns elongated with minute annulations along entire length, apex slightly flattened and rounded. Dorsum of thorax smooth. Tip of wing reaching posterior margin of second abdominal segment. Legs reaching posterior margin of third abdominal segment, hind pair slightly longer than other pairs.

Abdomen. Segments II–VII with inconspicuous annuli. Tergites and sternites with transverse rows of small spinose tubercles and a few scattered spines in between them on posterior and anterior parts. The middle part of pleurite forms sharp edge with two spines. Terminal segment of female pupa elongate, but blunt in male.

1. *Eloeophila abrupta* (Alexander, 1949) (Fig. 7, Pl. 2A)

Limnophila (*Elaeophila*) *aldrichi abrupta* Alexander, 1949: 309–310; 1954: 63;
Eloeophila abrupta Oosterbroek, 2023.

DESCRIPTION. General. Thorax gray, abdomen obscure yellow. Male body length 5.6–8.0 mm, female 9.7 mm, male wing length 7.0–9.0 mm, female 9.8 mm. **Head.** Brownish gray. Male antenna 1.0–1.5 mm long, female 1.7 mm. Scape pruinose. Pedicel brownish testaceous. Flagellum light yellow, turning darker towards apex. Four basal flagellomeres oval, slightly dilated ventrally, 5–7 segments spindle-shaped, remaining segments elongate, nearly cylindrical. Verticils dark brown, 1.5 times as long as respective segments. Rostrum gray, palpus brownish gray. **Thorax.** Pronotum gray. Prescutum and presutural scutum gray to brownish gray with four indistinct darker stripes. Median pair separated by narrow line. Scutal lobe slightly darkened. Dorsopleural membrane dark brownish gray. Pleuron dark gray. Wing with grayish tinge, yellowish at base. Stigma distinct, dark brown, slightly elongate. Five large dark brown spots at frontal margin. Dark spots surround cross-veins and tips of all longitudinal veins at wing margin, branching points of veins and cross-veins and at tips of all longitudinal veins along wing margin. Veins grayish brown, yellowish at wing base. Venation typical for the genus, but holotype has aberrant wing venation, as already mentioned in original description. It has two extra cross-veins between radius and radial sector, two cross-veins at base of cell *r*₃, supernumerary cross-vein in cell *bm*, typical for the genus, is lacking, cell *m*₁ very small. Original species description has illustration of typical wing venation, which was probably made from paratype. It shows supernumerary cross-vein in cell *bm* and long *m*₁. Holotype also has atypical wing pattern with dark spot extending along whole *Rs* length. Typical specimens (Alexander, 1949) have separate dark spots at origin and at branching point of *Rs*. Male wing slightly dilated along posterior margin. Male halter 0.9–1.0 mm long, female 1.0 mm. Halter pale yellow, knob same color as stem. Coxae pale brown to brownish yellow, posterior coxa yellow. Trochanters yellow. Femur yellow with narrowly and indistinctly darkened tip. Tibia yellow with narrowly and indistinctly darkened tip. Three basal tarsomeres yellow with darkened distal part, remainder of tarsus brown to dark brown. Male femur II: 6.5 mm long, III: 6.7 mm, tibia II: 5.7 mm, III: 6.1 mm, tarsus II: 3.7 mm, III: 4.2 mm. **Abdomen.** Abdominal segments yellow at base with distal margin widely dark brown. Pregenital segments uniformly dark brown. Male terminalia brown. Epandrium



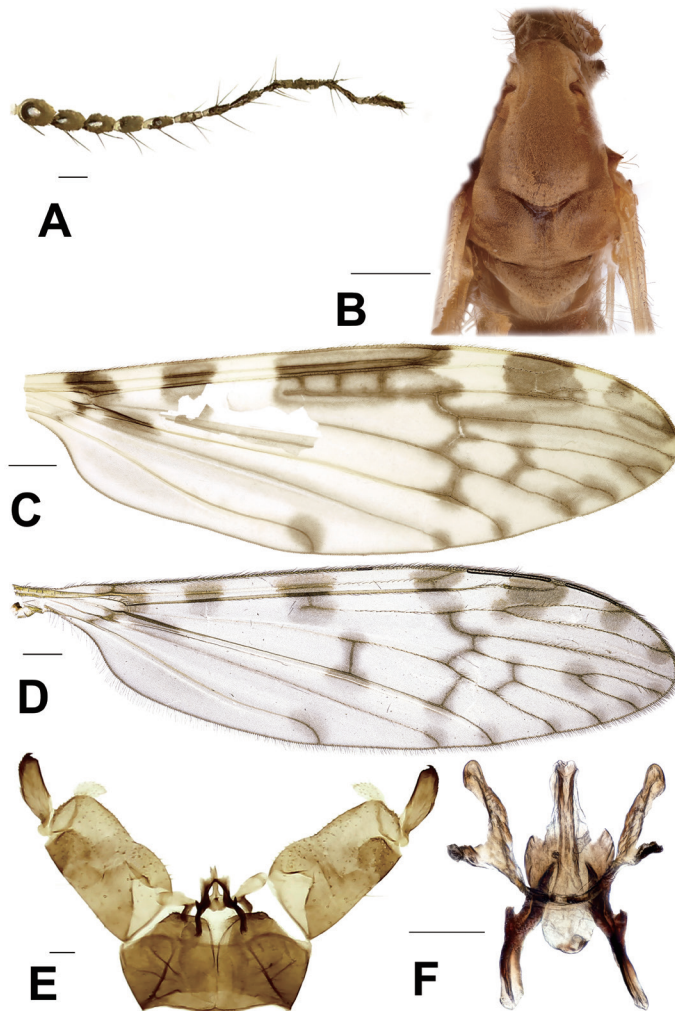
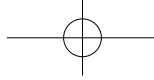


Fig. 7. *Eloeophila abrupta* (Alexander, 1949m) male, holotype. **A.** Antenna, holotype; **B.** Thorax, dorsal view; **C.** Wing, holotype (aberrant venation); **D.** Wing (normal venation); **E.** Male genitalia, dorsal view, holotype; **F.** Aedeagal complex, dorsal view. Scale bars: A, E, F = 0.1 mm; B, C, D = 0.5 mm.

with deep and narrow median incision and low, wide, blunt-apexed lobes on both sides of it. Very tip darkened and bearing small serration. Gonocoxite elongate, slightly dilated at basal half. Outer gonostylus elongate, sclerotized, apex blackened, hook shaped. Crest on outer margin with small spine-shaped structure directed upwards, thus hardly visible in dorsal view, fine serration beyond it. Inner gonostylus pale, fleshy, and setose. Interbase blackened with small process in the middle. Paramere club-shaped, pale, with elongate narrow darkened lateral process reaching to about middle of lateral apodeme. Lateral projection of lower shelf extends into sharp angle. Lateral apodeme elongate, blackened, narrow in dorsal view, reaching far beyond frontal margin of vesica. Aedeagus straight, bifid at apex. Apodeme of vesica directed anteroventrally thus hardly visible in dorsal view.





ELEVATION. From 300 m to 1400 m.

PERIOD OF ACTIVITY. From late June through to middle of August.

HABITAT. Unknown.

GENERAL DISTRIBUTION. USA (Washington, Oregon).

EXAMINED MATERIAL. Holotype (as *Limnophila (Elaeophila) abrupta*), male (wing, two legs and genitalia slide-mounted), USA, Oregon, Mt. Hood, Hood River, Meadows, August 8, 1946, C.P. Alexander (USNM); paratype (as *Limnophila (Elaeophila) abrupta*), male (pinned, antenna, wing, foreleg and genitalia slide-mounted), USA, Washington, Olympic Hot Spring, altitude 671 m (2200 ft), August 7, 1947, C.P. Alexander (USNM); one female (pinned), topotypic (USNM); one specimen with unclear sex (pinned), USA, Oregon, Mountain Hood, Still Creek, July 16, 1947, K.M. Fender (USNM); one male and one female (pinned, male genitalia in microvial with glycerol on same pin), USA, Oregon, Mountain Hood, Still Creek, July 17, 1947, K.M. Fender (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Washington, Elbe, Rainier Mountain, altitude 366 m (1200 ft), July 24, 1947, C.P. Alexander (USNM); two males (pinned, genitalia of one male in microvial with glycerol on same pin), USA, Oregon, Eel Creek, Forest Camp, August 11, 1948, K.M. Fender (USNM); one female (pinned), USA, Oregon, Curry Co., Chetco River, August 11, 1948, K.M. Fender (USNM); two males (pinned, genitalia of one male in microvial with glycerol on same pin), USA, Oregon, Humbug Mountain, August 5, 1950, K.M. Fender (USNM); two males, one female (pinned, genitalia of one male in microvial with glycerol on same pin), USA, Oregon, Siskiyou, N.7 Grayback Camp, altitude 555 m (1820 ft), August 8, 1950, K.M. Fender (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Oregon, Union Creek Fish Camp, Crater Lake Highway, June 29, 1967, K.M. & V.M. Fender (USNM).

2. *Eloeophila aldrichi aldrichi* (Alexander, 1927) (Fig. 8, Pl. 2B)

Limnophila (Ephelia) aldrichi Alexander, 1927b:11–12; 1948b: 49;

Limnophila (Elaeophila) aldrichi Alexander, 1954: 16;

Limnophila (Eloeophila) aldrichi Alexander, 1967: 107, 110–111;

Eloeophila aldrichi aldrichi Ribeiro, 2008: 631, 635, 655, 671, 681, 682, 683, 684, 691; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration brownish gray. Male body length 5.8–9.1 mm, female 5.3–9.9 mm, wing length of male 6.3–8.9 mm, female 6.4–9.7 mm. **Head.** Dark brownish gray. Male antenna 0.9–3.0 mm, female 0.9–1.9 mm long. Both basal antennomeres dark brown. Basal half of flagellum yellow, distal segments turning darker towards apex. Female flagellum generally darker than that of male. Four basal flagellomeres oval, slightly dilated ventrally, 5–7 segments spindle-shaped, remaining segments elongate, nearly cylindrical. Apical flagellomere nearly as long as preceding segment. Vercils dark brown, 1.5 times as long as respective segments. Rostrum dark grayish brown, palpus dark brown. **Thorax.** Densely dusted with gray. Pronotum brownish gray. Prescutum and presutural scutum brownish gray with four indistinct darker stripes that are more distinct frontally, disappearing towards posterior margin of sclerite, lateral stripes can



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be missing completely. Area between medial and lateral stripe can bear line of small dots. Median pair separated by narrow brighter line. Scutal lobe darkened. Pseudosutural fovea distinct, dark brown, subcircular. Pleuron dark brown with indistinct brighter areas. Wing with grayish or brownish tinge, yellowish at base. Stigma distinct, dark brown. Seven dark brown spots at frontal margin, size variable depending on specimen. Lighter specimens with separate small spots surrounding tip of Sc and $sc-r$, darker specimens with one larger spot in that area. Dark spots surround all cross-veins, branching points and tips of all longitudinal veins at wing margin. Veins grayish brown, yellowish at wing base. Venation typical for the genus, but male from Canada has extra cross-veins between M_2 and M_3 and missing distal part of M_2 . Posterior wing margin slightly dilated in male. Male halter 0.8–1.2 mm, female 0.7–1.4 mm long, pale yellow, knob brownish. Coxae brownish yellow, posterior coxa yellow. Trochanters brownish yellow. Femur yellow with narrowly darkened tip in darker specimens, with tips of femora just slightly infuscate in lighter specimens. Tibia yellow with narrowly and indistinctly darkened tip. Three basal tarsomeres yellow with darkened distal part, remainder of tarsus brown to dark brown. Male femur I: 4.5–6.0 mm long, II: 4.4–5.3 mm, III: 4.5–6.8 mm, tibia I: 4.2–6.3 mm, II: 4.2–5.1 mm, III: 4.7–6.3 mm, tarsus I: 3.7–5.7 mm, II: 3.5–5.0 mm, III: 3.0–4.5 mm. Female femur I: 3.7–6.4 mm long, II: 4.2–6.8 mm, III: 4.1–7.3 mm, tibia I: 3.5–6.6 mm, II: 3.7–6.2 mm, III: 3.6–7.1 mm, tarsus I: 3.1–6.2 mm, II: 3.7–5.3 mm, III: 2.7–4.8 mm. **Abdomen.** Grayish brown. Segments widely yellowish brown at base in lighter specimens, uniformly grayish brown in specimens from Canada. Male terminalia yellowish brown to orange brown. Epiandrium with slightly concave and finely setose posterior margin. Gonocoxite elongate, distinctly dilated at base, serrated medially at base. Outer gonostylus elongate, sclerotized, apex hook shaped. Outer margin with spine-shaped outgrowth at about two-thirds length, finely serrate beyond it. Inner gonostylus pale, narrowly darkened along frontal margin, fleshy and setose, apex broadly obtuse, bearing 4–5 setae. Paramere with strongly arched distal part, lateral process short, blunt-apexed. Lateral apodeme long and narrow in dorsal view, blackened with small process in the middle. Lateral projection of lower shelf with a sharp angle at posterior margin. Aedeagus straight, simple, not reaching distal margin of paramere. Apodeme of vesica directed anteroventrally, thus hardly visible in dorsal view.

ELEVATION. From 600 m to nearly 2600 m.

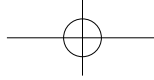
PERIOD OF ACTIVITY. From beginning of June through to middle of August.

HABITAT. Margins of rivers and creeks covered by mixed forests with thick understory of shrubs and grasses, margins of very fast rocky creeks covered with fir trees, creeks in more open areas but with dense cover of willows. Also steep sloped canyons, beaver dammed streams with dense cover of sagebrush, dwarf willows and other shrubs. Adults are attracted to light.

GENERAL DISTRIBUTION. Canada (Alberta, British Columbia), USA (Alaska, Arizona, California, Idaho, Montana, Nevada, Oregon, Utah, Washington, Wyoming).

EXAMINED MATERIAL. Holotype (as *Limnophila (Ephelia) aldrichi*), male (hind leg slide-mounted), USA, Montana, Glacier Park Station, altitude 1463 m (4800 ft), July 24, [no year], J.M. Aldrich (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, California, Walla Walla, Mill Creek, July 2–6, 1922, A.L. Melander (USNM); one male (pinned), Canada, [Alberta], Banff, Alta, August 5, 1925, O. Bryant (USNM); one male (pinned), Canada, [Alberta], Banff, Alta, August 9, 1928, O. Bryant, at light (USNM); one male (pinned), Canada, British Columbia, Summerland, Mt. Apex, August 3, 1931, A.N. Gartrell (CNC); one specimen





with unclear sex (pinned), USA, California, Miami, Mariposa grove, June 7, 1940, Astken, C.P. Alexander (USNM); one female (pinned), USA, California, Olympics, Boulder Lake Trail, altitude 2195 m (7200 ft), August 5, 1941, C.P. Alexander (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Idaho, Coeur d'Alene N. for 1463 m (4800 ft), July 5, 1942, L.L. Warnes (USNM); one female (pinned), USA, California, Kings Canyon National Park, July 19, 1946, C.P. Alexander (USNM); two females (pinned), USA, California, Humboldt Co., Prairie Creek, July 31, 1946, C.P. Alexander (USNM); one male, one female (pinned), USA, Oregon, Crater Lake, altitude 1829 m (6000 ft), August 2, 1946, C.P. Alexander (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Arizona, White Mountains, alpine, altitude 2560 m (8400 ft), June 23, 1947, C.P. Alexander (USNM); one male, one female (pinned, male genitalia in microvial with glycerol on same pin), USA, California, Truckee River, altitude 1829 m (6000 ft), June 30, 1947, C.P. Alexander (USNM); one male, one female, one specimen of unclear sex (pinned), USA, California, Truckee River, altitude 1829 m (6000 ft), July 1, 1947, C.P. Alexander (USNM); one female (pinned), USA, Oregon, Juntura, Malheur River, June 22, 1948, D.G. Denning (USNM); one female (pinned), USA, Oregon, Upper Walla Walla River, altitude 442 m (1450 ft), July 4, 1948, C.P. Alexander (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, California, Wenatchee Nat. Forest camp, altitude 884 m (2900 ft), July 7, 1948, C.P. Alexander (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Oregon, Mountain Hood, Tillie Game Creek, July 30, 1948, K.M. Fender (USNM); one male, one female (pinned, male genitalia in microvial with glycerol on same pin), USA, Oregon, Bend, Tumalo Creek, altitude 1100 m (3610 ft), August 14, 1948, C.P. Alexander (USNM); one female (pinned), USA, California, Upper Santa Ana River, July 13, 1950, A.L. Melander (USNM); two males (pinned, genitalia of one male in microvial with glycerol on same pin), USA, California, Yosemite Tuolumne Meadows, altitude 2608 m (8555 ft), July 16, 1950, C.P. Alexander (USNM); one male, one specimen of unclear sex (pinned, male genitalia in microvial with glycerol on same pin), USA, California, Mono Co., W. Walker River, altitude 1981 m (6500 ft), July 18, 1950, C.P. Alexander (USNM); one female (pinned), USA, Oregon, Coquille River S. fork, *Daphne* grows for camp, August 6, 1950, K.M. Fender (USNM); two males (pinned, one male genitalia in microvial with glycerol on same pin), USA, Alaska, AHMP 1213, July 8, 1952, Casam (USNM); two females (pinned), USA, California, Castle Crags, altitude 610 m (2000 ft), July 8, 1953, C.P. Alexander (USNM); two males (pinned, genitalia of one male in microvial with glycerol on same pin), USA, Washington, Rainier, Ohanapecosh, altitude 610 m (2000 ft), July 28, 1953, C.P. Alexander (USNM); one male, one female (pinned, male genitalia in microvial with glycerol on same pin), USA, California, King Canyon, S. fork of King River, July 20, 1957, C.P. Alexander (USNM); six males, six females, one specimen of unclear sex (pinned, genitalia of two males in microvial with glycerol on same pin), USA, California, Yosemite, Tuolumne Meadows, altitude 2608 m (8555 ft), July 26, 1957, C.P. Alexander (USNM); one male, one female (pinned, male genitalia in microvial with glycerol on same pin), USA, California, Mammoth, Coldwater Creek, altitude 2743 m (9000 ft), July 27, 1957, C.P. Alexander (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Idaho, Idaho Co., Trilby Lake, 20 mi. SE of Elk City, altitude 2408 m (7900 ft), August 18, 1971, Garney (USNM); one male (pinned), USA, California, Butte Co., Paradise, July 7–12, 1982, C. & A.V. Nidek (Naturalis, RMNH.INS.1543977); one male (pinned), USA, Utah, Summit Co., Shingle Creek Campground, 15.3 km E Kamas on Hwy #150, altitude 2256



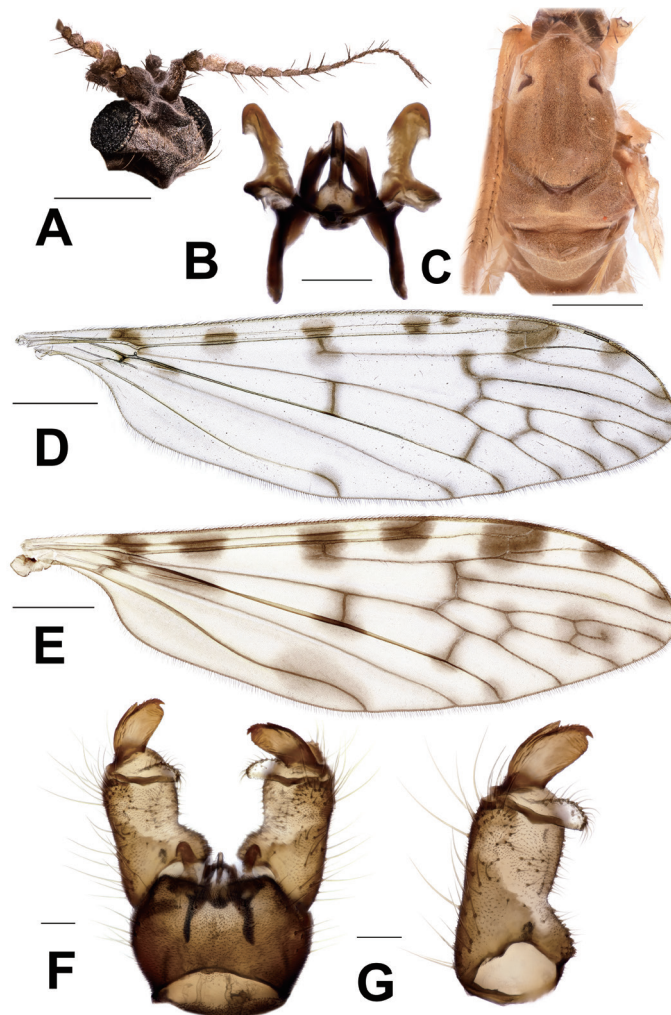
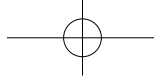


Fig. 8. *Eloeophila aldrichi aldrichi* (Alexander, 1927) male. **A.** Head (Canada); **B.** Aedeagal complex, dorsal view (Canada); **C.** Dorsum of thorax (Canada); **D.** Wing (California); **E.** Wing, variation (Canada); **F.** Male genitalia, dorsal view (Canada); **G.** Gonocoxite with gonostylus, dorsal view (Canada). Scale bars: A, C = 0.5 mm; D, E = 1.0 mm; F, G = 0.1 mm.

m (7400 ft), July 14, 1985, J.K. Gelhaus #315, at light (ANSP); two males, one female (pinned), USA, Wyoming, Sublette Co., Sacajawea Campground, 39 km W of Big Piney, altitude 2530 m, July 27, 1986, J.K. Gelhaus #414, A. Roig (ANSP); one female (pinned), USA, Wyoming, Lincoln Co., La Barge Creek, 31 km SE Afton, July 28–29, 1986, J. Gelhaus #415, A. Roig (ANSP); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Washington, Chelan Co., Blewett at Peshastin Creek, July 10–11, 1988, W.E. Steiner (USNM); one female (pinned), USA, Nevada, Humboldt Co., Santa Rosa Range, Humboldt National Forest, Lye Creek Campground, T.44N, R.44E, 22, 41°41'04"N, 117°33'22"W, altitude 2090 m, August 1, 1995, J.K. Gelhaus & W. Bouchard #683 (ANSP); two females (pinned), USA, Nevada, Elko Co., Humboldt National Forest,





Independence Mts., Jack Creek Campground, T.42N, R.53E, sec. 19, 41°31'N, 116°04'W, altitude 1981 m, August 2–3, 1995, J.K. Gelhaus & W. Bouchard #686 (ANSP); one male, one female (pinned), USA, Nevada, Elko Co., Humboldt National Forest, Jarbridge Mts., Jarbridge River, Pine Ck. Campground, 6.4 km S Jarbridge, T.46N, R.58E, 33, 41°50'N, 115°25'W, altitude 2010 m, August 4, 1995, J.K. Gelhaus & W. Bouchard #689 (ANSP); one male, two females (pinned), same data, at light (ANSP); one female (pinned), USA, Nevada, Elko Co., Humboldt National Forest, Jarbridge Mountains, Camp Draw Trailhead, on Seventysix Creek, T45N, R58E, 32, 41°45'N, 115°26'W, altitude 2320 m, August 5, 1995, J.K. Gelhaus & W. Bouchard #691 (ANSP); one male, two females (pinned), USA, Nevada, Elko Co., Humboldt National Forest, Ruby Mountains, Road's End Picnic Ground, Lamoille Canyon, T32N, R58E, 36, 40°36'18"N, 115°22'34"W, altitude 2540 m, August 6, 1995, J.K. Gelhaus & W. Bouchard #694 (ANSP); one male (pinned), USA, California, Modoc Co., Warner Mountains, South Emerson Trail, at campground & trailhead, N Fork Emerson Ck., 6.4 km SW Eagleville, N 41°15'48", W 120°8'21", altitude 1793 m, July 11, 2000, A. & J. Gelhaus #840-2 (ANSP); three males, two females, one specimen of unclear sex (pinned), USA, California, Fresno Co., Sierra Nevada, Sierra N.F., Kaiser Creek, N 37.36°, W 119.24°, altitude 1635 m, July 17, 2004, J.N. Hogue, JNH #230 (CSUN); four females, one specimen of unclear sex (pinned), USA, Montana, Missoula Co., Lolo Nat. Forest, lower West Fork Butte Creek, 46.7468°N, 114.3159°W, July 15, 2021, A. Fasbender (ANSP); two males (slide-mounted), USA, Montana, Missoula Co., Lolo National Forest, lower West Fork Butte Creek, 46.7468°N, 114.3159°W, July 22, 2021, A. Fasbender (ANSP); twenty four males, seven females (pinned), USA, Montana, Missoula Co., West Fork Butte Creek at Trail# 311 on Forest Service Road #451, Lolo National Forest, 46.7467°N, 114.3159°W, altitude 1173 m, July 9, 2023, J. Gelhaus #1830 et al. (ANSP).

REMARK. Differs from *E. angustior* by wider wing, light knob of halter. Female differs from *E. aldrichi alticrista* by lighter overall body coloration, smaller and less distinct wing spots.

3. *Eloeophila aldrichi alticrista* (Alexander, 1943) (Fig. 9, Pl. 2C)

Limnophila (*Elaeophila*) *aldrichi alticrista* Alexander, 1943a: 165;

Eloeophila aldrichi alticrista Oosterbroek, 2023.

DESCRIPTION. General. Body coloration brownish gray. Male body length about 7.5 mm, female 7.9–8.9 mm, wing length of male 7.4–8.5 mm, female 8.5–9.4 mm. **Head.** Dark brownish gray. Male antenna 0.9–1.5 mm long, female 1.0–1.6 mm. Both basal antennomeres dark brown. Basal half of flagellum yellow, distal segments turning darker towards apex. Four basal flagellomeres oval, slightly dilated ventrally, 5–7 segments spindle-shaped, remaining segments elongate, nearly cylindrical. Apical flagellomere nearly as long as preceding segment. Verticils dark brown, 1.5 times as long as respective segments. Rostrum dark grayish brown, palpus dark brown. **Thorax.** Densely dusted with gray. Pronotum brownish gray. Prescutum and presutural scutum brownish gray with four indistinct darker stripes. Median pair separated by narrow brighter line. Scutal lobe darkened. Pseudosutural fovea distinct, dark brown, subcircular. Pleuron dark brown with indistinct brighter areas. Wing with brownish tinge, yellowish at base. Stigma distinct, dark brown. Seven dark brown spots at frontal margin. Dark spots surround all cross-veins and branching points. Spots surrounding



tips of all longitudinal veins at wing margin indistinct or missing. Veins grayish brown, yellowish at wing base. Venation typical for the genus, radial sector short-spurred at base, anal vein with distinct subapical spur. Wing narrow, posterior margin indistinctly dilated at apex of anal vein in male. Male halter 0.9–1.4 mm long, female 1.0–1.2 mm. Halter pale yellow, knob brownish. Coxae brownish yellow, posterior coxa yellow. Trochanters brownish yellow. Femur yellow with narrowly darkened tip in darker specimens, lighter specimens with tips of femora just slightly infuscate. Tibia yellow with narrowly and indistinctly darkened tip. Three basal tarsomeres yellow with darkened distal part, remainder of tarsus brown to dark brown. Male femur I: 4.8–5.6 mm long, II: 5.3–6.9 mm, III: 5.5–6.6 mm, tibia I: 5.2–6.4 mm, II: 4.8–6.6 mm, III: 5.6–6.1 mm, tarsus I: 4.6–6.0 mm, II: 4.2–4.6 mm, III: 3.8 mm. Female femur I: 4.6 mm long, II: 5.6 mm, III: 5.3–5.9 mm, tibia I: 4.6 mm, II: 5.0 mm, III: 5.0–5.4 mm, tarsus I: 4.4 mm, III: 3.7–3.8 mm. **Abdomen.** Grayish brown. Segments widely yellowish brown at base. Male terminalia yellowish brown to orange-brown. Epandrium with slightly concave and finely setose posterior margin. Gonocoxite elongate, distinctly dilated at base, serrated medio-basally. Outer gonostylus wide, sclerotized, apex hook shaped. Outer margin with high crest at about two-thirds length, finely serrate beyond it. Inner gonostylus pale, narrowly darkened along frontal margin, fleshy and setose. Paramere with club-shaped distal part, lateral process elongate, slightly arched, blunt-apexed. Lateral apodeme long and narrow in dorsal view, blackened with small process at middle. Lateral projection of lower shelf with a rounded angle at posterior margin. Aedeagus straight, simple, nearly reaching distal margin of paramere. Apodeme of vesica directed anteroventrally, thus hardly visible in dorsal view.

ELEVATION. From 2000 m to 3500 m.

PERIOD OF ACTIVITY. From late June through to end of July.

HABITAT. Margins of creeks covered by mixed forests (aspen, fir) with dense undergrowth of *Artemisia*, willows and grassy vegetation.

GENERAL DISTRIBUTION. USA (Colorado, Wyoming).

EXAMINED MATERIAL. Holotype (as *Limnophila (Elaeophila) aldrichi alticrista*), male (wing and genitalia slide-mounted), USA, Colorado, Gothic, altitude 3078 m (10,100 ft), July 12, 1934, Alexander (USNM); one specimen with unclear sex (pinned), USA, Colorado, Colorado Springs, Cheyenne Canyon, June 27, 1934, C.P. Alexander (USNM); two males (pinned, one male genitalia in microvial with glycerol on same pin), USA, Colorado, Monarch Pass, altitude 3200 m (10,500 ft), July 1, 1934, C.P. Alexander (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Colorado, Monarch Pass, altitude 3505 m (11,500 ft), July 7, 1934, C.P. Alexander (USNM); one specimen with unclear sex (pinned), topotypic (USNM); one female (pinned), topotypic, altitude 3048 m (10,000 ft) (USNM); one female (pinned), USA, Colorado, Gothic, altitude 2896 m (9500 ft), July 31, 1934, C.P. Alexander (USNM); two males (pinned, male genitalia in microvial with glycerol on same pin), USA, Colorado, Gothic, July 21, 1938, I. Williams (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Wyoming, Grand Tetons, Arizona Creek, altitude 2073 m (6800 ft), July 1, 1941, C.P. Alexander (USNM); one female (pinned), USA, Wyoming, Big Horn Mountains, altitude 2134 m (7000 ft), July 14, 1942, C.P. Alexander (USNM); one male (pinned), USA, Wyoming, Albany Co., Green Rock Picnic Ground, 8 km NW Centennial, altitude 2987 m, July 24, 1986, J. Gelhaus #409, A. Roig (ANSP); one male (pinned), USA, Colorado, Alamosa Co., Great Sand Dunes National Monument, Mosca Creek, altitude 2500 m, July 9, 1991, I. Yarom (ANSP).



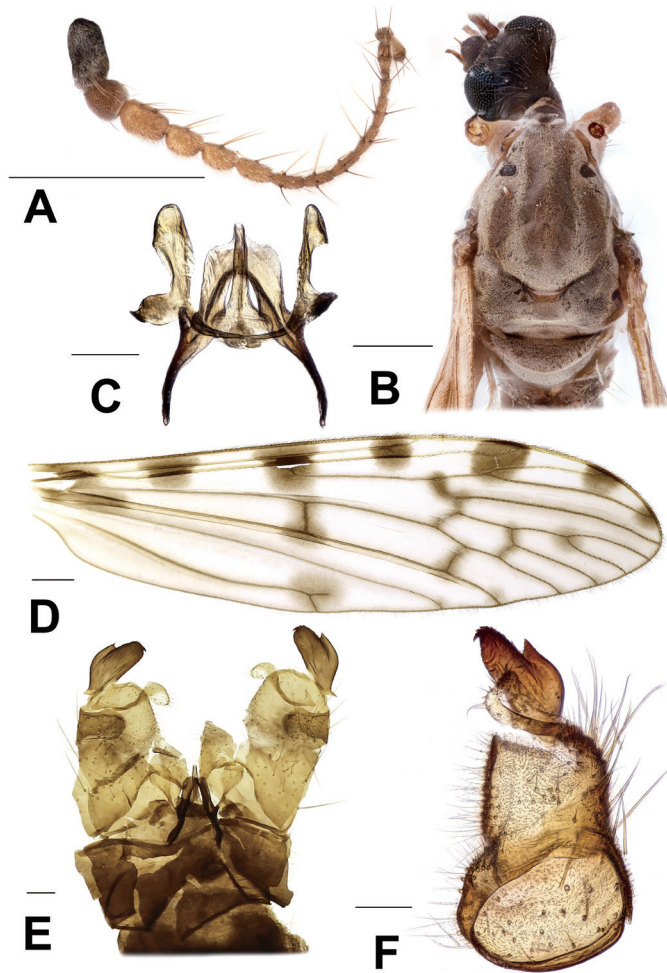


Fig. 9. *Eloeophila aldrichi alticrista* (Alexander, 1943) male. **A.** Antenna; **B.** Dorsum of thorax; **C.** Aedeagal complex; **D.** Wing, holotype; **E.** Male genitalia, dorsal view, holotype; **F.** Gonocoxite with gonostyles, dorso-frontal view. Scale bars: A, B, D = 0.5 mm; C, E, F = 0.1 mm.

REMARK. Male differs from *E. aldrichi aldrichi* by the very high crest of the outer gonostylus of male terminalia. Female differs from *E. aldrichi aldrichi* by darker gray overall body coloration, larger and more distinct wing spots.

4. *Eloeophila aldrichi collata* (Alexander, 1948) (Fig. 10, Pl. 2D)

Limnophila (*Elaeophila*) *aldrichi collata* Alexander, 1948: 48–49;
Eloeophila aldrichi collata Oosterbroek, 2023.

DESCRIPTION. General. Body coloration brownish gray. Male body length 7.5–8.0 mm,



female 7.8–9.0 mm, wing length of male 6.5–8.7 mm, female 6.5–9.5 mm. **Head.** Dark brownish gray. Male antenna 1.0–1.2 mm long, female 1.1–1.4 mm. Both basal antennomeres dark brown. Basal half of flagellum yellow, distal segments turning darker towards apex. Four basal flagellomeres oval, slightly dilated ventrally, 5–7 segments spindle-shaped, remaining segments elongate, nearly cylindrical. Apical flagellomere nearly as long as preceding segment. Verticils dark brown, 1.5 times as long as respective segments. Rostrum dark grayish brown, palpus dark brown. **Thorax.** Densely dusted with gray. Pronotum brownish gray. Prescutum and presutural scutum brownish gray with four indistinct darker stripes. Median pair separated by narrow brighter line. Scutal lobe darkened. Pseudosutural fovea distinct, dark brown, subcircular. Pleuron dark brown with indistinct brighter areas. Wing with brownish tinge, yellowish at base. Stigma distinct, dark brown. Seven dark brown spots at frontal margin. Dark spots surround all cross-veins and branching points. Spots surrounding tips of all longitudinal veins at wing margin indistinct or missing. Veins grayish brown, yellowish at wing base. Venation typical for the genus, radial sector short-spurred at base, anal vein with distinct subapical spur. Wing narrow, posterior margin indistinctly dilated at apex of anal vein in male. Halter pale yellow, knob brownish. Male halter 0.8–1.1 mm long, female 1.1–1.2 mm. Coxae brownish yellow, posterior coxa yellow. Trochanters brownish yellow. Femur yellow with narrowly darkened tip in darker specimens, lighter specimens with tips of femora just slightly infusate. Tibia yellow with narrowly and indistinctly darkened tip. Three basal tarsomeres yellow with darkened distal part, remainder of tarsus brown to dark brown. Male femur I: 4.9–5.1 mm long, II: 5.3 mm, III: 5.7–6.2 mm, tibia I: 4.8–5.3 mm, II: 4.6–4.7 mm, III: 5.0–5.5 mm, tarsus I: 3.8–4.4 mm, II: 3.6–3.7 mm, III: 3.6–3.7 mm. Female femur I: 4.9 mm long, II: 4.2–5.4 mm, III: 6.0 mm, tibia I: 5.1 mm, II: 3.5–4.9 mm, III: 5.6 mm, tarsus I: 4.9 mm, II: 3.4–4.2 mm. **Abdomen.** Grayish brown. Segments widely yellowish brown at base. Male terminalia yellowish brown to orange-brown. Epandrium with slightly concave and finely setose posterior margin. Gonocoxite elongate, distinctly dilated at base, serrated medially at base. Outer gonostylus wide, sclerotized, apex hook-shaped. Outer margin with high crest at about two-thirds length, finely serrate beyond it. Inner gonostylus fleshy and setose, narrow, especially at apex which bears single seta, pale, narrowly darkened along frontal margin. Paramere with strongly arched distal part, lateral process short, blunt-apexed. Lateral apodeme long and narrow in dorsal view, blackened with small process at middle. Lateral projection of lower shelf with a sharp angle at posterior margin. Aedeagus straight, simple, far not reaching distal margin of paramere. Apodeme of vesica directed anteroventrally, thus hardly visible in dorsal view.

ELEVATION. From 2100 m to 3300 m.

PERIOD OF ACTIVITY. From late June to late August.

HABITAT. Margins of creeks. Species is attracted to light.

GENERAL DISTRIBUTION. USA (Utah).

EXAMINED MATERIAL. Holotype (as *Limnophila (Elaeophila) aldrichi collata*), male (pinned, wing slide-mounted), USA, Utah, Beaver, altitude 2438 m (8000 ft), June 26, 1942, C.P. Alexander (USNM); paratypes, male (pinned, antenna, two legs, wing and genitalia slide-mounted) and female (wing slide-mounted), topotypic; paratype, male (wing and genitalia slide-mounted), non-type female, FUSA, Utah, Mt. Timpanogos, glacier lake, [no date], D.E. Hardy (USNM); one female (pinned), USA, Utah, Trout Creek, July 27, 1933, H.B. Stafford (USNM); one female (pinned), USA, Utah, Duchesne Co., Hanna, July 24, 1945, Knowlton (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Utah, Brian Head, altitude 3292 m (10,800



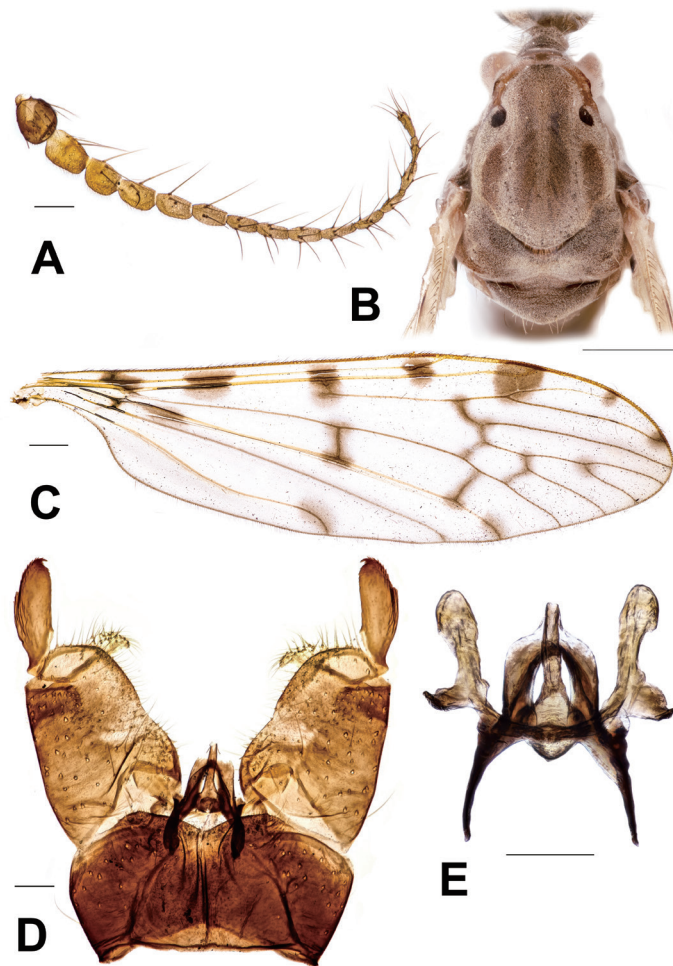
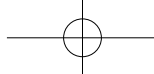


Fig. 10. *Eloeophila aldrichi collata* (Alexander, 1948) male. **A.** Antenna, paratype; **B.** Thorax, dorsal view; **C.** Wing, paratype; **D.** Male genitalia, dorsal view, paratype; **E.** Aedeagal complex, dorsal view. Scale bars: A, D, E = 0.1 mm; B, C = 0.5 mm.

ft), July 5, 1946, C.P. Alexander (USNM); one specimen with unclear sex (pinned), USA, Utah, Unita Co., Carter Creek, August 26, 1953, E. Pitt (USNM); one male, one female (pinned), USA, Utah, Cache Co., Bear River Range of Wasatch Mts., Tony Grove Creek, 41.89°N, 11.60°W, altitude 2150 m, July 15, 2000, at blacklight, J.N. Hogue, JNH #155 (CSUN); one male (pinned), USA, Utah, Cache Co., Wasatch Range, Cache National Forest, Tony Grove Creek, NE of Logan, 41.887°N, 11.596°W, altitude 2160 m, July 1, 2017, blacklight, J.N. Hogue, JNH #578 (CSUN).

REMARK. Differs from the typical *E. aldrichi* by the inner gonostylus of male genitalia. Inner gonostylus of *E. a. collata* conspicuously narrowed, especially at apex, the actual tip bearing a single seta, the other being removed from this tip. In typical *E. aldrichi* the apex is broadly obtuse, there being four or five setae on this bluntly rounded portion (Alexander, 1948).





5. *Eloeophila aleator* (Alexander, 1945) (Fig. 11, Pl. 2E)

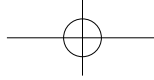
Limnophila (*Elaeophila*) *aleator* Alexander, 1945: 422–423;

Limnophila (*Eloeophila*) *aleator* Alexander, 1967: 107, 111;

Eloeophila aleator Oosterbroek, 2023.

DESCRIPTION. General. Body coloration gray. Male body length 6.5–7.7 mm, female 7.0–8.8 mm, wing length of male 7.0–8.6 mm, female 7.6–9.0 mm. **Head.** Dark gray. Anterior vertex with blackish spot or stripe. Male antenna 0.9–1.6 mm long, female 1.1–1.6 mm. Both basal antennomeres brown to dark brown, scape sparsely pruinose. Flagellum yellowish brown at base, turning grayish brown towards apex. Four basal flagellomeres oval, slightly dilated ventrally, remaining segments turning elongate towards apex of antenna. Flagellomeres covered with whitish pubescence ventrally. Longest verticils 1.4 times as long as respective segments. Rostrum dark brown, sparsely dusted with gray, palpus dark brown to black. **Thorax.** Pronotum brownish gray with darker brown median line or entirely dark dorsally, postpronotum grayish. Prescutum and presutural scutum yellowish gray with four distinct dark brown stripes. Medial stripes not reaching posterior margin of sclerite. Scutal lobe brownish gray with dark spot. Area between lobes also marked with dark. Pseudosutural fovea distinct, black. Scutellum grayish brown with dark median line, posterior margin light gray. Mediotergite brownish gray, pruinose, medial line indistinct or missing. Dorsopleural membrane dark brown to black. Pleuron dark brown, densely dusted with gray. Wing with yellowish tinge, yellow at base and along frontal margin. Stigma distinct, dark brown. Six dark brown spots at frontal margin. Dark spots surround all cross-veins and branching points, wing cells along frontal margin usually without small dots or these are very few, remaining cells with numerous small dots. Veins grayish brown, yellowish at wing base and in costal field. Venation typical for the genus, radial sector angulate and short-spurred at base, discal cell small, cell m_1 long and narrow, longer than its stem, anal vein slightly arched subapically, reaching wing margin at about same level as base of *Rs*. Atypical wing with two supernumerary cross-veins in cell *bm* and supernumerary cross-vein m_2-m_3 closing additional cell m_{1+2} (Fig. 3B). Wing narrow, posterior margin just slightly rounded, widest at middle, approximately at apex of vein *CuP*. Male halter 1.0–1.1 mm long, female 1.0–1.3 mm. Stem of halter yellow with brownish base, knob dark brown with pale base. Coxae brown dorsally, yellow ventrally, fore and middle pairs darker, posterior yellow with narrowly darker dorsal margin. Trochanters brownish yellow, posterior pair more brownish. Femur obscure yellow with narrowly brown tip, tibia brownish yellow with narrowly brown tip. Basal tarsomere light brown, yellowish at base and narrowly darker at apex, distal tarsomeres brown to dark brown. Male femur I: 4.5–5.4 mm long, II: 5.2–5.8 mm, III: 5.3–6.3 mm, tibia I: 5.1–6.2 mm, II: 4.9–5.7 mm, III: 4.9–6.3 mm, tarsus I: 4.6–5.5 mm, II: 4.2–5.1 mm, III: 4.3–4.7 mm. Female femur I: 4.6 mm long, II: 4.2 mm, III: 4.5–5.7 mm, tibia I: 4.4 mm, II: 3.6 mm, III: 4.2–4.7 mm, tarsus I: 4.8 mm, II: 3.7 mm, III: 3.3–3.5 mm. **Abdomen.** Brownish yellow to light brown. Tergites with posterior and lateral margins brown. Sternites yellow to obscure yellow. Pregenital segments darker brown. Male terminalia brown. Epandrium with nearly straight posterior margin. Gonocoxite elongate. Outer gonostylus wide, sclerotized, apex hook shaped. Outer margin with high crest at about two-thirds length, finely serrate beyond it and below hook-shaped apex. Inner gonostylus fleshy and setose, pale, narrowly darkened along frontal margin. Paramere with club-shaped distal part, lateral process wider at base, turning





narrow and sinuous distally in dorsal view. Lateral projection of lower shelf narrows distally, without angle-shaped projection at apex. Lateral apodeme wide, dark brown, extending far beyond anterior margin of vesica, having just small bump at middle. Aedeagus straight, tip reaching slightly beyond distal part of paramere, bifid at apex. Apodeme of vesica directed anteroventrally, thus hardly visible in dorsal view.

ELEVATION. From 600 m to more than 2500 m.

PERIOD OF ACTIVITY. Late March through to late July.

HABITAT. Along stream seepages, fast flowing rocky rivers in deep valleys covered with mixed forests (maple, ponderosa pine, shrubby oak), males forming swarms under trees.

GENERAL DISTRIBUTION. USA (California, Colorado, Montana, New Mexico, Oregon, Utah, Wyoming).

EXAMINED MATERIAL. Holotype (as *Limnophila (Elaeophila) aleator*), male (hind leg, wing and genitalia slide-mounted), USA, Wyoming, Grand Teton Natural Forest, Arizona Cr., altitude 2070 m (6790 ft), July 2, 1941, C.P. Alexander (USNM); one female (pinned), USA, Colorado, Boulder Co., Pinecliff, July 22, 1916, Oslar (ANSP) (most probably erroneous label (Scott, 2016)); one male (pinned), USA, Colorado, Pine Cliff, July 11, 1920, Oslar (ANSP) (most probably erroneous locality label (Scott, 2016)); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Colorado, Green Mountain Falls, altitude 2438 m (8000 ft), June 27, 1934, C.P. Alexander (USNM); one female (pinned), USA, California, Yosemite, Mirror Lake, altitude 1219 m (4000 ft), June 6, 1939, A. Downes (USNM); two females (pinned), USA, California, Nevada Co., Cisco, June 13, 1939, Casier (USNM); two males (pinned, one male genitalia in microvial with glycerol on same pin), USA, Wyoming, Grand Tetons, Arizona Creek, altitude 2073 m (6800 ft), July 1, 1941, C.P. Alexander (USNM); one male (pinned, male genitalia in microvial with glycerol on same pin), USA, Colorado, Rocky Mountain National Park, altitude 2545 m (8350 ft), July 18, 1941, C.P. Alexander (USNM); two males, four females (pinned, male genitalia in microvial with glycerol on same pin), USA, Colorado, Rocky Mountain National Park, altitude 2499 m (8200 ft), July 21, 1941, C.P. Alexander, two males and three females: Fern L. Trail near Moraine Park, one female: Thompson Road (USNM); one male, one female (pinned, male genitalia in microvial with glycerol on same pin), USA, Colorado, Rocky Mountain National Park, glacier basin, altitude 2545 m (8350 ft), July 23, 1941, C.P. Alexander (USNM); one female (pinned), USA, Utah, Beaver, altitude 2438 m (8000 ft), June 26, 1942, C.P. Alexander (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Wyoming, Grand Tetons, altitude 2134 m (7000 ft), July 10, 1942, C.P. Alexander (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Utah, Zion National Park, altitude 1372 m (4500 ft), May 5, 1943, Knowlton (USNM); two females (pinned), USA, Utah, Glendale, May 5, 1943, Knowlton (USNM); one female (pinned), USA, Oregon, McMinnville, May 9, 1945, K.M. Fender (USNM); two males, two females (pinned, one male genitalia in microvial with glycerol on same pin), USA, Oregon, Happy Valley near McMinnville, April 14, 1946, K.M. Fender (USNM); one male, one specimen of unclear sex (pinned), USA, Oregon, Peavine Ridge near McMinnville, St. 1, April 15, 1946, K.M. Fender (USNM); two males, two females (pinned, genitalia of one male in microvial with glycerol on same pin), USA, Oregon, Peavine Ridge near McMinnville, St. 1, April 23, 1946, K.M. Fender (USNM); one specimen with unclear sex (pinned), USA, Oregon, Peavine Ridge near McMinnville, St. 1, May 2, 1946, K.M. Fender (USNM); one female (pinned), USA, Oregon, Three Rivers, May



23, 1948, K.M. Fender (USNM); three males (pinned, genitalia of one male in microvial with glycerol on same pin), USA, Oregon, Ochoco National Forest, Silver Rock, May 26, 1950, K.M. Fender (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Oregon, Valsetz, April 22, 1956, K.M. Fender (USNM); one male, one female (pinned, male genitalia in microvial with glycerol on same pin), USA, Utah, Millard Co., Oak Creek Canyon, June 12, 1972, G.F. Knowlton (USNM); seven males (pinned), USA, Utah, Millard Co., Oak Creek campground 5.3 km SE of Oak City, T17S, R4W, 11, altitude 1798 m, June 11, 1986, J.K. Gelhaus #394, swarm 6:30 PM, 5–6 ft high under maple tree (ANSP); one male (pinned), USA, California, Kern Co., Alder Ck. Cmpgrd, Sequoia National Forest, ±16 km E Glennville on CA#155, 2 km S CA#155, T25S, R31E, 26, 35°43'N, 118°36'30"W, 1189 m, June 19, 1995, J. Gelhaus #620 (ANSP); one female (pinned), USA, Montana, Gallatin Co., East Gallatin River, 45.7070°, -111.0341°, June 16, 2023, J.B. Runyon (Montana State University).

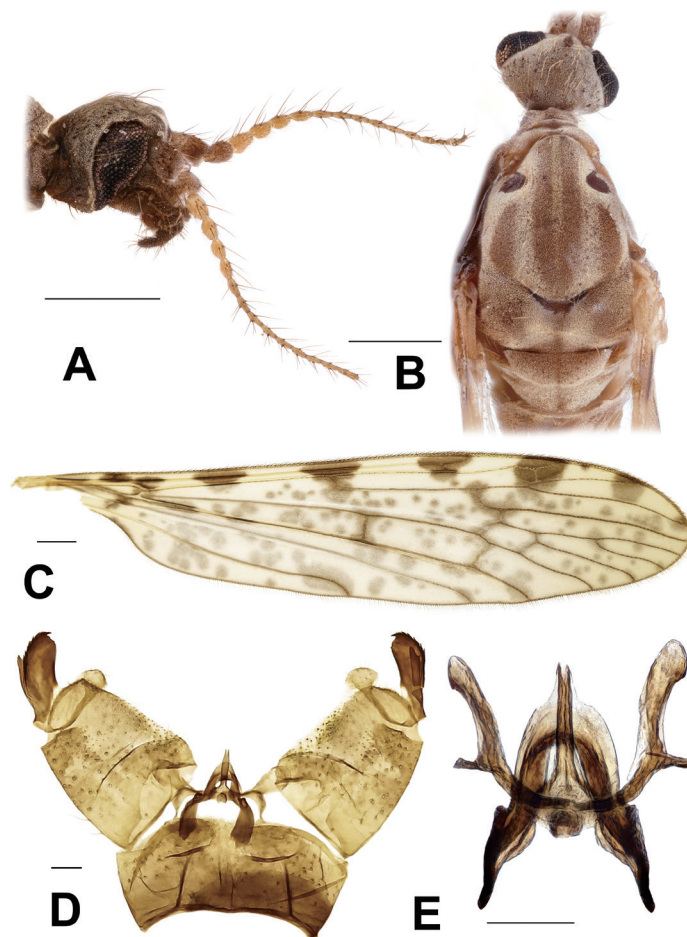
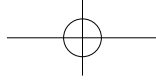


Fig. 11. *Eloeophila aleator* (Alexander, 1945) male. **A.** Head with antennae, lateral view; **B.** Dorsum of thorax; **C.** Wing, holotype; **D.** Male genitalia, dorsal view, holotype; **E.** Aedeagal complex, dorsal view, holotype. Scale bars: A–C = 0.5 mm; D, E = 0.1 mm.





6. *Eloeophila amamiana* (Alexander, 1956) (Fig. 12, Pl. 2F)

Limnophila (*Elaeophila*) *amamiana* Alexander, 1956a: 671–672;

Eloeophila amamiana Nakamura, 2014: 12; Kato, 2021: 426–428; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration brown to dark brown. Male body length 4.1–5.5 mm, female 6.0–7.2 mm, wing length of male 4.8–6.2 mm, female 5.5–6.6 mm. **Head.** Dark greyish brown. Male antenna 1.1–1.2 mm long, reaching to about base of wing if bent backwards. Antenna dark brown, scape sparsely pruinose. Flagellomeres elongate, segments turning longer towards apex of antenna. Verticils slightly exceed length of respective segments. Rostrum black. Palpus black. **Thorax.** Pronotum brown. Prescutum and presutural scutum brownish grey, longitudinal stripes indistinct, darker brown. Original description mentions four stripes and area separating medial stripes as wide as stripe itself, but specimen from Okinawa has three stripes without paler line along middle. Medial stripe far not reaching posterior margin of sclerite. Kato (2021) writes that some specimens have four indistinct stripes. Area behind stripe pale. Scutal lobe darker brown. Area between lobes pale. Pseudosutural fovea distinct, dark brown, oval. Scutellum brownish pale with narrow dark medial line, slightly darkened along lateral margin. Mediotergite brown, pruinose. Pleuron brownish grey with darker brown areas. Wing with grayish tinge, yellowish at base and along frontal margin. Stigma oval, light, brownish. Indistinct dark spots at wing base, at all cross-veins, at vein branching points, at tips of longitudinal veins and on anal vein at the level of *Rs* base. Veins brownish gray, yellowish at wing base. Venation typical for the genus, radial sector angulate at base, *m-cu* at middle of discal cell, cell *m*₁ long and narrow, nearly twice as long as its stem, anal vein slightly sinuous, reaching wing margin distinctly beyond base of *Rs*. Wing narrow, posterior margin just slightly rounded, widest at middle beyond apex of anal vein. Male halter 0.8 mm long, obscure yellow, knob slightly infusate. Coxae yellow, fore coxa brownish at base. Trochanters yellow. Femur brownish yellow without darker apical ring. Tibiae brownish yellow with indistinctly darkened tip. Tarsus brownish yellow at base, turning brownish towards distal end. Male femur I: 4.0 mm long, II: 4.4 mm, III: 4.5 mm, tibia I: 4.2 mm, II: 3.9 mm, III: 4.1 mm, tarsus I: 3.9 mm, II: 3.5 mm, III: 3.2 mm. **Abdomen.** Tergites dark brown, sternites yellowish brown, pregenital sternites darker brown. Male terminalia brown. Epandrium with “V”-shaped incision at middle of posterior margin. Gonocoxite elongate, narrowing towards distal end. Outer gonostylus elongate, sclerotized, apex with spine-shaped outgrowth subdorsally, right outer gonostylus of holotype with two such spines, but left gonostylus and other studied specimens have just one spine, outer margin with crest extended into subapical spine, inner margin right-angled. Inner gonostylus fleshy and setose, pale, narrowly darkened along frontal margin. Paramere with long blade-shaped medial process that is three times as long as triangle-shaped lateral process (dorsal view). Lateral projection of lower shelf narrows distally, without angulate apical projection. Lateral apodeme blackened, wide and massive at base, with long and narrow, slightly arched distal part (dorsal view). Aedeagus straight, apex simple, undivided. Vesica (sperm pump) oval. Apodeme of vesica directed anteroventrally, thus hardly visible in dorsal view.

ELEVATION. From sea level to 300 m.

PERIOD OF ACTIVITY. Adults fly from late January through to late May.

HABITAT. Unknown.



GENERAL DISTRIBUTION. Japan (Ryukyu Island).

EXAMINED MATERIAL. Holotype (as *Limnophila (Elaeophila) amamiana*), male (antenna, wing and genitalia slide-mounted), Japan, Louchoos, Amami Oshima, Shinmura, March 26, 1954, T. Mohri (USNM); one male (pinned), Japan, Okinawa, Mt. Fuenchiji-dake, Yona, Kunigami-son, altitude 250 m, May 21, 2016, D. Kato (NRC).

REMARK: Resembles *E. tergilobella* Kato, 2021. Halter of *E. amamiana* about half length of thorax, 1.3 times as long as thorax in *E. tergilobella*. Posterior margin of male tergites 7 and 8 straight, but bearing paired lobes in *E. tergilobella* (Kato, 2021).

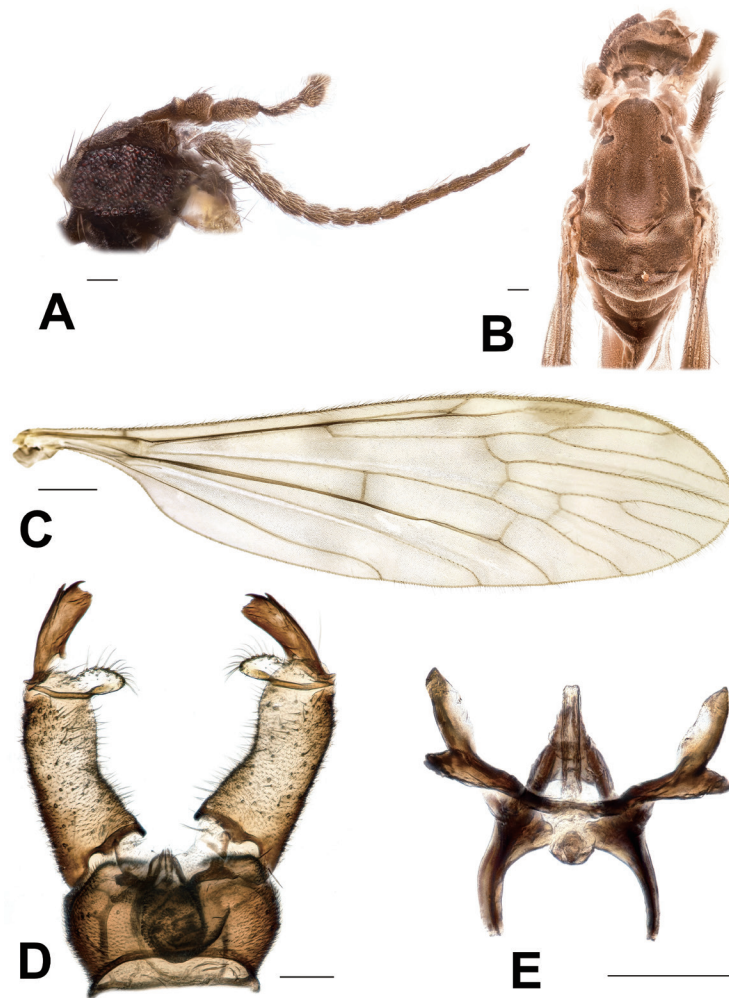
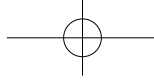


Fig. 12. *Eloeophila amamiana* (Alexander, 1956) male. **A.** Antenna (Okinawa); **B.** Dorsum of thorax (Okinawa); **C.** Wing, holotype; **D.** Genitalia, dorsal view (Okinawa); **E.** Aedeagal complex, dorsal view (Okinawa). Scale bars: A, B, D, E = 0.1 mm; C = 0.5 mm.





7. *Eloeophila angolensis* (Alexander, 1963) (Fig. 13, Pl. 3A)

Limnophila (*Elaeophila*) *angolensis* Alexander, 1963: 33–34;

Eloeophila angolensis Oosterbroek, 2023.

DESCRIPTION. General. Body coloration dark gray. Male body length 6.0–6.2 mm, wing length 6.5–6.8 mm. **Head.** Dark brown. Male antenna 1.2–1.4 mm long. Scape brown, pruinose. Pedicel yellowish brown. Flagellum yellow with apical flagellomeres slightly darker. Flagellomeres oval, turning slightly longer towards apex of antenna, covered with dense whitish pubescence. Apical segment slightly smaller than penultimate. Longest verticils twice as long as respective flagellomeres. Rostrum black. Palpus black. **Thorax.** Pronotum large, grayish brown with dark brown median line. Prescutum and presutural scutum grayish brown with two indistinct darker brown medial longitudinal stripes not reaching posterior margin of sclerite. Lateral margin with short narrow line next to pseudosutural fovea. Both stripes separated by narrow dark brown line frontally. Few dark brown dots lined along lateral stripe margin. Lateral stripes less distinct than medial. Area behind stripes pale. Scutal lobe grayish brown with two darker brown spots. Area between lobes pale grayish brown. Pseudosutural fovea distinct, dark brown, rounded, surrounded by yellowish area. Scutellum dark brown with grayish posterior and lateral margins. Mediotergite pruinose, brownish gray. Pleuron blackened. Wing with grayish tinge, yellowish at base. Stigma dark brown. Two large dark brown spots at frontal wing margin, one at base of R_s , another at tip of R_1 and R_2 , at branching point of R_s and at base of R_5 . Third large spot at wing apex. Smaller but distinct dark brown spots at arculus, surrounding supernumerary cross-vein in cell bm , around $m-cu$, at tip of Sc and $sc-r$, at tip of R_1 , and at tip of anal vein. Numerous small dots dispersed through all wing cells. Venation typical for the genus, radial sector arcuate at base, $m-cu$ at middle of discal cell, cell m_1 long, longer than its stem, anal vein strongly arched before wing margin and bearing short spur. It reaches wing margin approximately at same level as base of R_s . Male wing widened along posterior margin, widest slightly beyond tip of anal vein. Halter obscure yellow, knob brownish black. Male halter 1.1 mm long. Coxae black. Trochanters black. Femur, tibia and tarsus yellow to brownish yellow. Male femur III: 5.2 mm long, tibia III: 4.7 mm, tarsus III: 3.3 mm. **Abdomen.** Segments dark brown, sparsely dusted with gray. Male terminalia dark brown with brown to light brown gonostyli. Epandrium with shallow depression at middle of posterior margin and with slightly raised lateral corner. Gonocoxite strongly elongate, approximately 2.3 times as long as wide, slightly constricted at middle. Outer gonostylus elongate, sclerotized, yellowish brown with dark margins. Apex with large spine, outer margin serrated at distal end, inner margin smooth with large, rounded angle distally. Inner gonostylus fleshy and setose, pale, narrowly darkened along frontal margin. Paramere with long blade-shaped anterior process and small rounded lateral process. Lateral apodeme of lower shelf long and narrow, extending far beyond tip of vesical apodeme, bearing small rounded subbasal lobe laterally. Aedeagus long and straight, apex bifid. Apodeme of vesica long and narrow, blackened. Vesica subglobular.

ELEVATION. Unknown.

PERIOD OF ACTIVITY. From beginning of October through to beginning of March.

HABITAT. Unknown.

GENERAL DISTRIBUTION. Angola.



EXAMINED MATERIAL. Holotype (as *Limnophila angolensis*), male (pinned), Angola, Dundo, River Luachimo, October 2, 1960, Machado (Mus. Roy. Afr. Centr. RMCA ENT 000017054); one male (pinned), Angola (A25), Rio Longa, 4 miles S. Lussusso, 8.III.1972 (BMNH).

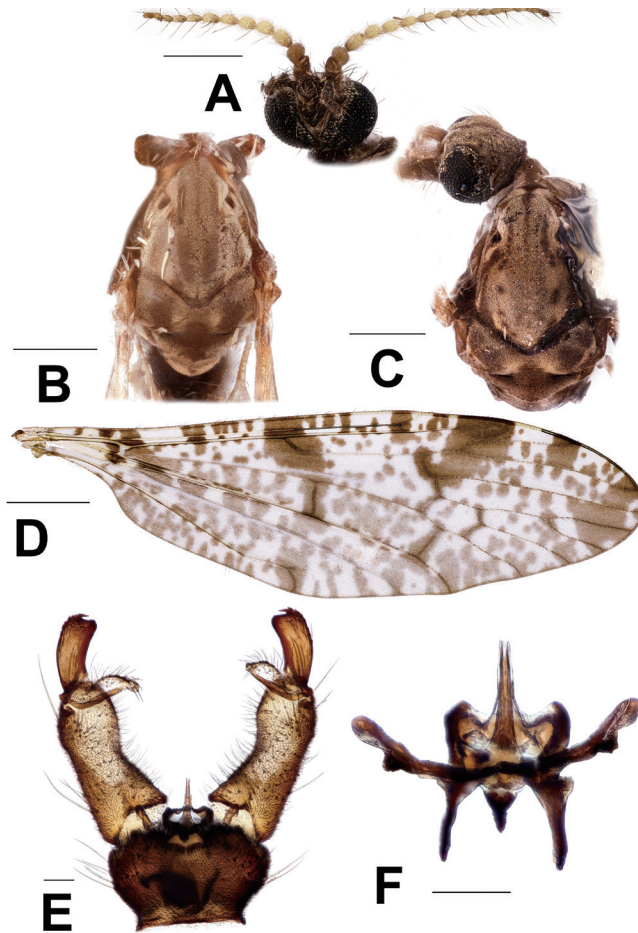
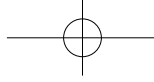


Fig. 13. *Eloeophila angolensis* (Alexander, 1963), male. **A.** Head (Rio Longa); **B.** Dorsum of thorax, holotype; **C.** Dorsum of thorax (Rio Longa); **D.** Wing (Rio Longa); **E.** Genitalia, dorsal view (Rio Longa); **F.** Aedeagal complex, dorsal view (Rio Longa). Scale bars: A–C = 0.5 mm; D = 1.0 mm; E, F = 0.1 mm.

8. *Eloeophila angustior* (Alexander, 1919) (Fig. 14, Pl. 3B)

Limnophila (*Ephelia*) *angustior* Alexander, 1919: 163–164;
Limnophila (*Elaeophila*) *angustior* Alexander, 1948: 49;
Limnophila (*Eloeophila*) *angustior* Alexander, 1967: 107, 111;
Eloeophila angustior Oosterbroek, 2023.





DESCRIPTION. General. Male body length 4.8–6.5 mm, female 5.9–8.4 mm, male wing length 6.4–7.6 mm, female 6.0–8.3 mm. **Head.** Brown, posteriorly light brown, densely dusted with yellowish gray. Occiput with darker brown median line, more distinct frontally, less so posteriorly. Male antenna 1.3–2.2 mm, female 0.9–1.5 mm long. Both basal antennomeres dark brown. Scape elongate, nearly cylindrical, covered with grayish pruinosity. Pedicel twice as short as scape, wider distally. Flagellum brown basally, dark brown distally. Two-three basal flagellomeres yellowish at base. Flagellomeres covered with dense whitish pubescence. Longest verticils reaching to about half length of respective segments. **Thorax.** Pronotum brown, postpronotum yellowish. Prescutum and presutural scutum with three dark longitudinal stripes. Median stripe extending from frontal margin of sclerite to suture, wide, darker along middle, lateral margin paler. Lateral stripe less distinct, margin of sclerite unmarked. Scutal lobe yellowish brown with darker brown central area. Area between lobes dark brown. Scutellum brownish yellow. Mediotergite light brown covered with grayish pruinosity. Pleuron grayish brown with wide obscure yellow longitudinal stripe that extends from head to base of Abdomen. Wing narrow with grayish tinge and dark brown to greyish brown spots. Dark spots along frontal wing margin small, much narrower than the interspaces. Veins and cross-veins surrounded by narrow seams. Veins dark brown, yellowish in costal region and at wing base. Venation typical for the genus, radial sector arcuate at base, *m-cu* at about one-third of discal cell's length, cell *m₁* long, slightly more than twice as long as its stem, anal vein slightly arched before apex. It reaches wing margin before the base of *Rs*. Supernumerary cross-vein in cell *bm* distinctly beyond base of *Rs*. Male wing not widened along posterior margin, widest at tip of vein *CuP*. Anal lobe long and narrow. Male halter 0.9–1.2 mm, female 1.0–1.1 mm long. Stem of halter yellow, knob dark brown with pale base. Coxae yellow, fore coxa brownish frontally. Trochanters brownish yellow. Femur yellowish brown to light brown with darker brown ring at apex. Tibia brown with narrowly darker apex. Three basal tarsomeres brown, distal tarsomeres dark brown. Basitarsus yellowish at base. Male femur I: 4.1–5.2 mm long, II: 4.9–5.2 mm, III: 4.3–5.9 mm, tibia I: 4.2–5.5 mm, III: 3.7–6.1 mm, tarsus I: 4.4–5.4 mm, III: 4.0–4.5 mm. Female femur I: 3.4–3.6 mm long, II: 4.0–5.0 mm, III: 3.4–3.6 mm, tibia I: 3.1–3.3 mm, II: 3.1–4.2 mm, III: 3.6–4.0 mm, tarsus I: 3.6–3.7 mm, II: 3.1–3.9 mm, III: 2.8–3.7 mm. **Abdomen.** Tergites yellowish brown with widely dark brown posterior and lateral margins. Pregenital segment dark brown, posterior margin of tergite narrowly grayish. Male terminalia dark brown. Gonocoxite strongly elongate, approximately 2.2–2.3 times as long as wide, with blackened bump at apex that is covered with tuft of long yellow curled setae exceeding gonostyli in length. Outer gonostylus elongate, sclerotized, with apical spine and with distally serrated outer margin, outer margin with crest extended into spine at about four fifths of stylus. Inner gonostylus fleshy and setose with blunt rounded apex. Paramere with two branches, posterior wide round-apexed, plate-shaped, anterior about twice as short as posterior, narrow and blunt-apexed. Lateral apodeme of lower shelf with long and narrow anterior process that slightly narrows posteriorly. Lateral projection of lower shelf narrows posteriorly, it has no subapical angle-shaped projection, pale membranous posteriorly. Aedeagus long and straight. Aedeagal apodeme directed anteroventrally, blunt-apexed.

ELEVATION. From 1400 m to nearly 3100 m.

PERIOD OF ACTIVITY. From end of May through to end of July.

HABITAT. Margins of fast streams in deep rocky canyons covered with pines, willows and other shrubs, adults hide among willow and nettle.



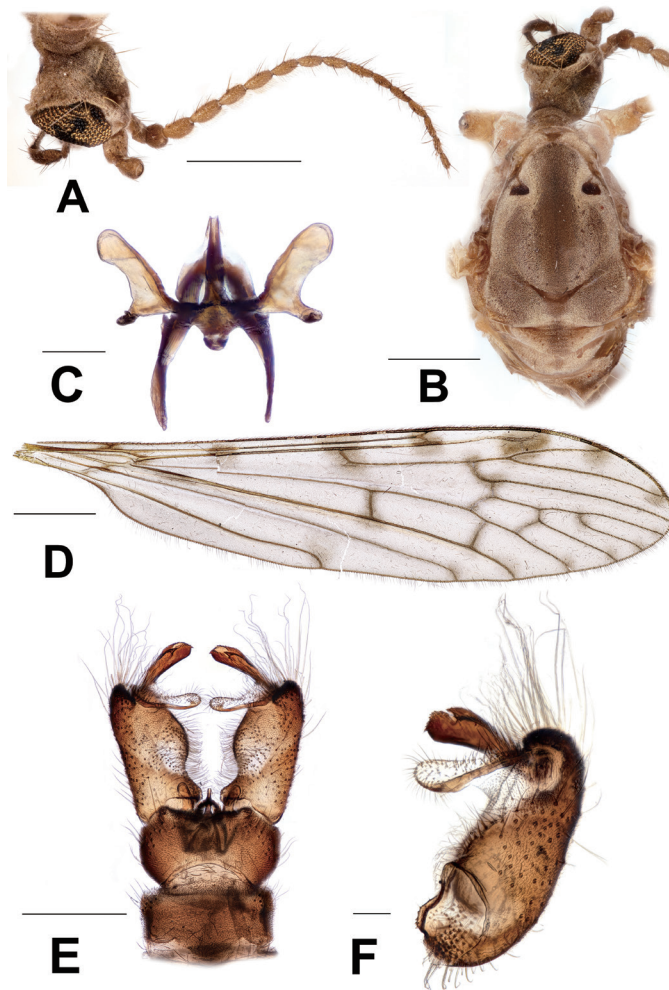
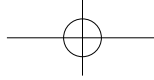


Fig. 14. *Eloeophila angustior* (Alexander, 1919), male. **A.** Head and antenna, lateral view; **B.** Head and thorax, dorsal view; **C.** Aedeagal complex, dorsal view; **D.** Wing; **E.** Male genitalia, dorsal view; **F.** Gonocoxite with gonostyles, fronto-dorsal view. Scale bars: A, B, E = 0.5 mm; C, F = 0.1 mm; D = 1.0 mm.

GENERAL DISTRIBUTION. USA (California, Colorado, Idaho, Montana, Nevada, Oregon, Utah, Wyoming).

EXAMINED MATERIAL. One male (pinned, genitalia in microvial with glycerol on same pin), USA, Colorado, Rocky Mountain National Park, July 23, 1900, D.G. Denning (USNM); one male, one specimen with unclear sex (pinned, male genitalia in microvial with glycerol on same pin), USA, Wyoming, Yellowstone, Emerald Pool, St. 7, altitude 2217 m (7275 ft), June 30, 1941, C.P. Alexander (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Wyoming, Grand Tetons, altitude 2070 m (6790 ft), July 8, 1941, C.P. Alexander (USNM); one female (pinned), USA, Colorado, Rocky Mountain National Park, altitude 2545 m (8350 ft), July 23, 1941, C.P. Alexander (USNM); two males (pinned, genitalia of one male in microvial with





glycerol on same pin), USA, Utah, Logan Canyon, altitude 1463 m (4800 ft), June 30, 1942, C.P. Alexander (USNM); one male, one specimen with unclear sex (pinned, male genitalia in microvial with glycerol on same pin), USA, Wyoming, Evanston, altitude 2286 m (7500 ft), July 8, 1942, C.P. Alexander (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Colorado, Moffat Co., Browns' Park, altitude 2104 m (6904 ft), June 23, 1946, M.T. James (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Oregon, Chitwood, May 29, 1949, J.E. Davis (USNM); two males (pinned, genitalia in microvial with glycerol on same pin), USA, California, Mono Co., W. Walker River, altitude 1981 m (6500 ft), July 19, 1950, C.P. Alexander (USNM); one female (pinned), USA, Nevada, Ormsby Co., st. #2, altitude 2073 m (6800 ft), July 20, 1950, C.P. Alexander (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Colorado, Mesa Co., Glade Park, July 8, 1955, A.B. Gurney (USNM); two males (pinned, genitalia in microvial with glycerol on same pin), USA, Utah, Uintah Co., Whiterocks, July 11, 1972, Knowlton, Hanson (USNM); one male, one female (pinned), USA, Colorado, Jefferson Co., 2.4 km E Kittredge on Hwy. 74, near Bear Creek, T4S, R71W,36, altitude 2076 m (6810 ft), July 10, 1985, J.K. Gelhaus #309 (ANSP); one male, two females (pinned), USA, Wyoming, Sublette Co., Sacajawea Campground, 39 km W of Big Piney, altitude 2530 m, July 27, 1986, J.K. Gelhaus #414, A. Roig (ANSP); one male (pinned), USA, Montana, Missoula Co., Howard Creek at Trailhead off Hwy. #12, Lolo National Forest, 46.7745°N, 114.4404°W, altitude 1183 m, July 9, 2023, J. Gelhaus #1833 et al. (ANSP).

REMARK. Differs from *E. aldrichi aldrichi* by narrower wing and dark knob of halter.

9. *Eloeophila apicata* (Loew, 1871) – Dark-tipped Mottled Linkwing (Figs. 1, 15, Pl. 3C)

Ephelia apicata Loew, 1871: 9; Meijere, 1921: 59; Czižek, 1931: 121–123; Lackschewitz, 1940: 72;
Idioptera apicata Edwards, 1921: 221;
Ephelia maculatifrons Pierre, 1924a: 89;
Ephelia masculatifrons Pierre, 1924a: 89–90;
Limnophila (Elaeophila) apicata Edwards, 1938: 79; Coe, 1950: 41;
Limnophila (Elaeophila) albofascia Alexander, 1975: 135–136;
Limnophila (Elaeophila) apicata Hewitt et al., 2005: 38;
Eloeophila (Eloeophila) apicata Ujvarosi, 2007: 230;
Eloeophila apicata Savchenko, 1986: 308–309; 1989: 82–83; Savchenko et al., 1992: 217; Podenas, 1995: 38; Starý, Oosterbroek, 1996: 55; Starý, Geiger, 1998: 74; Schacht, 1999: 134; 2005: 5; Pakalniskis et al., 2000: 6; 2006: 19; Reusch, Oosterbroek, 2000: 155; Petersen, Jong, 2001: 149; Eiroa, Baez, 2002: 54; Oosterbroek, Simova-Tosic, 2004: 445; Starý, 2004; 2007: 24; 2009a: 428; 2009b: 24; Starý et al., 2005: 24; Ujvarosi, 2005: 244; Parvu, 2006: 260; Podenas et al., 2006: plate 47; Wiedenska, 2007: 75; 2017: 12; Skidmore, 2009: 128; Podeniene, Gelhaus, 2010: 188; Dufour, Merz, 2012: 354; Hewitt, 2014: 13; Bilgin et al., 2015: 3, 6, 7, 8; Kolcsar et al., 2015: 30; 2021: 91; Boardman, 2016: 130; Brighton, 2017: 27, 36; Hubenov, 2017: 47; 2021: 30; Stuke, 2019: 142; Stubbs, 2021: 328; Oosterbroek, 2023.

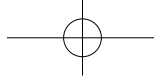


DESCRIPTION. General. Body coloration yellowish brown. Male body length 5.5–7.7 mm, female 7.0–10.3 mm. Wing length of male 6.0–8.0 mm, female 7.2–8.8 mm. **Head.** Light gray because of dense pruinosity. Vertex with two elongate dark brown spots behind eyes, often with additional small spot on frons right behind antennae. Male antenna 1.1–1.8 mm long, female 1.2–1.6 mm. Both basal antennomeres dark brown, flagellum yellow, turning darker towards apex. Four basal flagellomeres short with strongly dilated ventral face. Remaining flagellomeres elongate. Apical segment exceeds penultimate in length. Longest verticils 1.2 times as long as respective flagellomeres. Rostrum light brown. Palpus black. **Thorax.** Gray. Pronotum yellowish brown with dark brown median line. Prescutum and presutural scutum yellowish-grayish brown with two distinct dark brown medial longitudinal stripes reaching posterior margin of sclerite. Area separating stripes as wide as stripe itself. Lateral stripes distinct but short, far not reaching posterior margin of sclerite. Scutal lobe brownish gray, densely pruinose with dark brown stripe along middle. Area between lobes light gray with dark brown spot posteriorly that extends onto scutellum. Pseudosutural fovea distinct, dark brown, oblique, surrounded by yellowish area. Scutellum brownish gray. Mediotergite densely pruinose, light gray with indistinct darker medial line. Pleuron pale brown, vaguely patterned with darker. Wing with grayish tinge, intensely patterned with dark brown spots, no small dots along veins and in wing cells. Stigma dark brown. Frontal wing margin with five large spots, cross-veins, apices of longitudinal veins at wing margin and branching points surrounded by dark areas. Anal vein with two spots. Distinct and large dark spot at wing apex, but extreme tip of R_5 surrounded by small pale area. Venation typical for the genus, radial sector angulate at base, $m-cu$ at middle of discal cell, cell m_1 long, 2.3 times as long as its stem. Anal vein arched before wing margin and bearing short spur posteriorly. It reaches wing margin distinctly beyond level of R_5 base and beyond supernumerary cross-vein in cell bm . Male wing distinctly widened along posterior margin, widest at tip of anal vein. Female wing not widened posteriorly. Halter obscure yellow, knob dark brown. Male halter 0.9–1.3 mm long, female 1.0–1.3 mm. Coxae reddish brown. Trochanters yellow. Femur yellow with distinct and comparatively wide dark brown apical ring. Tibia yellow with narrowly brownish apex. Basal tarsomeres yellow to brownish yellow with darker apices, distal tarsomeres dark brown. Male femur I: 4.3–5.9 mm long, II: 5.7–6.1 mm, III: 5.4 mm, tibia I: 4.7–6.4 mm, II: 5.2–6.7 mm, III: 5.5 mm, tarsus I: 5.1–5.7 mm, II: 4.1–5.1 mm. Female femur I: 4.7–6.2 mm long, II: 5.5–6.2 mm, III: 6.2–6.9 mm, tibia I: 4.9–6.2 mm, II: 5.3–5.7 mm, III: 5.7–7.0 mm, tarsus I: 4.9–5.2 mm, II: 4.6–4.8 mm, III: 4.0–5.3 mm. **Abdomen.** Brownish yellow with large dark brown transverse bands on tergites. Female abdomen darker than that of male. Male terminalia yellowish brown. Epandrium with shallow depression at middle of posterior margin. Gonocoxite strongly elongate, approximately 2.4 times as long as wide, slightly narrows apically. Outer gonostylus elongate, sclerotized, brown. Distal margin with small spine at middle, serration above it and large rounded incision below. Inner gonostylus fleshy and setose, pale, narrowing towards apex. Paramere with long and narrow posterior process and small blunt-apexed blackened subbasal lobe. Aedeagus long and straight, extending far beyond apex of paramere, apex simple. Median projection of lower shelf triangle-shaped with two denticles on middle of posterior margin. Lateral projection of lower shelf blunt-apexed. Lateral apodeme plate-shaped with nearly parallel margins in lateral view but narrow in dorsal. Apodeme of vesica wide with rounded frontal margin. Sperm pump (vesica) oval.

ELEVATION. From sea level to nearly 1000 m (Hubenov, 2017).

PERIOD OF ACTIVITY. From late May through to middle of August.





HABITAT. Larvae develop at the bottom or margins of small streams with sandy bottom. Adults fly nearby, they are attracted to light. It has been found besides streams with some shading trees, but does not seem to be a woodland species (Stubbs, 2021); brooks, small rivers, swamps, moist soil (Ujvarosi, 2005).

GENERAL DISTRIBUTION. Europe, including Austria, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, France (including Corsica), Germany, Great Britain, Greece (Peloponnisos), Hungary, Ireland, Italy (including Sicily), Lithuania, Poland, Romania, Slovakia, Slovenia, Spain, Switzerland, Ukraine, Russia (North Caucasus: Dagestan), Georgia; Asia, including Turkey (Asiatic part: Eskisehir), Iran, Turkmenistan.

EXAMINED MATERIAL. One male, one female (pinned), Switzerland, Vaud, Belmont, July 4, 1948, F. Schmid (MCSN-VD); one male (pinned), Yugoslavia: Slovenia, Bohini, Riocev Laz, altitude 530 m, July 27 – August 6, 1973, A.E. Stubbs, B.M. 1975-553 (BMNH); one male (in ethanol), Switzerland, Ticino, Genestrerio, July 9–15, 1979, C. Dufour, W. Geiger, T. Malaise lumineuse (VU); one male (in ethanol), Switzerland, Ticino, Genestrerio, July 16–22, 1979, C. Dufour, W. Geiger, T. Malaise lumineuse (MHNN); two males (in ethanol), Switzerland, Genève, Croix-de-Rozon, August 6–12, 1979, C. Dufour, W. Geiger, T. Malaise lumineuse (MHNN); three females (in ethanol) Switzerland, Ticino, Genestrerio, August 6–12, 1979, C. Dufour, W. Geiger, T. Malaise lumineuse (VU); one male (in ethanol), Switzerland, Ticino, Genestrerio, August 20–26, 1979, T. Malaise lumineuse (MHNN); one male (in ethanol), Switzerland, Ticino, Genestrerio, September 10–16, 1979, T. Malaise lumineuse (MHNN); one male (in ethanol), Switzerland, Helvetia, altitude 590 m, St. Gallen-Ost Schaugenbädli, Lichtfalle, July 8–14, 1980 (MHNN); one male (in ethanol), Switzerland, Helvetia, altitude 590 m, St. Gallen-Ost Schaugenbädli Lichtfalle, July 21–27, 1980 (MHNN); one female (pinned), Lithuania, Varena district, Puvociai, August 3, 1988, S. Podenas (VU); one male, two females (in ethanol), Lithuania, Varena district, river Gruda, July 23, 1994, S. Podenas (VU); one female (pinned), Lithuania, Varena distr., Zervynos, July 9, 1997, S. Podenas (ANSP); one male (pinned), Lithuania, Varëna district, Puvočiai village, N54.115691°, E24.304731°, August 7, 2020, S. Podenas (VU); one male (pinned), Lithuania, Varëna district, river Gruda, N54.09262°, E24.37518°, August 10, 2020, S. Podenas, at light (VU); one male (pinned), Lithuania, Varëna district, Puvočiai village, N54.11410°, E24.30506°, August, 2021, S. Podenas (VU); one male (pinned), Lithuania, Varëna distr., Puvočiai, N54.11572°, E24.30489°, altitude 94 m, July 30, 2021, S. Podenas (VU); one male (pinned), Lithuania, Varena district, Puvociai, N54.11571°, E24.30489°, July 25, 2022, S. Podenas (NRC); one female (pinned), Lithuania, Varena district, Merkine env., lake Mergeliu Akeles, N54.17377°, E24.22313°, July 27, 2022, S. Podenas (NRC); two males, two females (pinned), Lithuania, Varena district, Marcinkonys env., river Gruda, N54.09276°, E24.37473°, August 3, 2022, S. Podenas (NRC); one male, five females (pinned), Lithuania, Varena district, Puvociai, N54.11571°, E24.30489°, August 5, 2022, S. Podenas (NRC); two females (in ethanol), Lithuania, Varena district, Puvociai, N54.11772°, E24.31027°, August 6, 2022, S. Podenas, at light (NRC); one male (pinned), Lithuania, Varena district, Puvociai, N54.11571°, E24.30489°, July 31, 2023, S. Podenas, at light (NRC); one male (pinned), Lithuania, Varena district, Kasetos, N54.11691°, E24.32653°, August 2, 2023, S. Podenas (NRC).

REMARK. The most distinctive features making it easily recognizable among other European species: two elongate dark spots on occiput, widely darkened apical part of the wing, very tip of the wing clear.



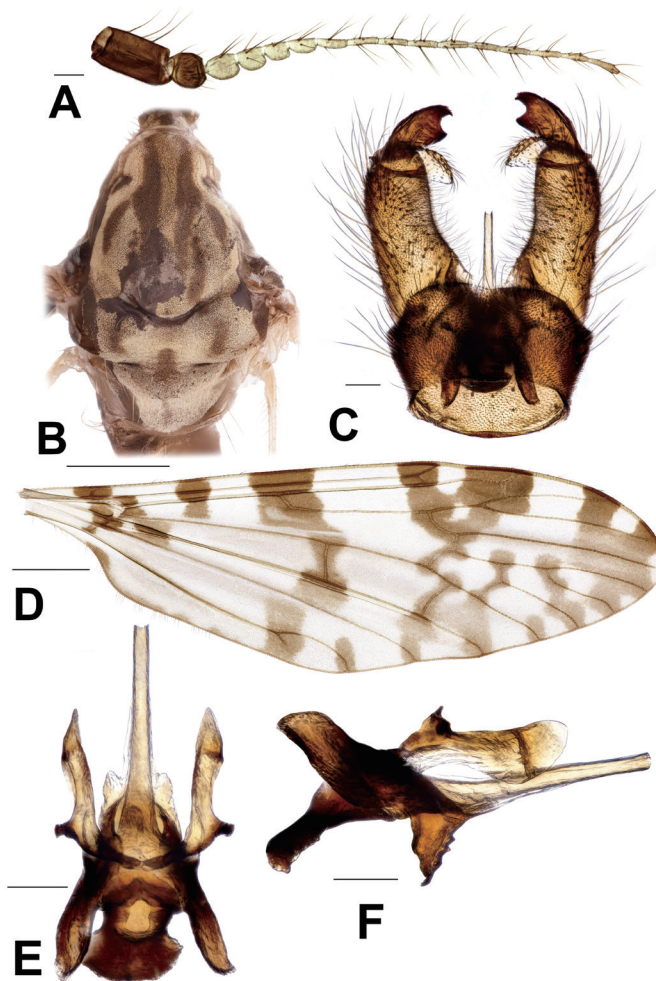


Fig. 15. *Eloeophila apicata* (Loew, 1871), male. **A.** Antenna; **B.** Thorax, dorsal view; **C.** Genitalia, dorsal view; **D.** Wing; **E.** Aedeagal complex, dorsal view; **F.** Aedeagal complex, lateral view. Scale bars: A, C, E, F = 0.1 mm; B = 0.5 mm; D = 1.0 mm.

10. *Eloeophila apicisetula* Kato, 2021 (Fig. 16, Pl. 3D)

Eloeophila apicisetula Kato, 2021: 428–429; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration from yellowish thorax to dark brown Abdomen. Male body length 4.8–5.9 mm, female 5.8–6.1 mm. Wing length of male 5.8–6.9 mm, that of female 5.8–5.9 mm. **Head.** Brown, densely covered with gray pruinosity. Vertex uniformly brownish gray, only sockets of setae dark brown. Male antenna 1.4–1.6 mm long. Both basal antennomeres dark brown, dusted with gray, scape elongate, nearly cylindrical, approximately twice as long as pedicel. Flagellum pale ochreous, turning darker towards apex. Five basal flagellomeres short, three



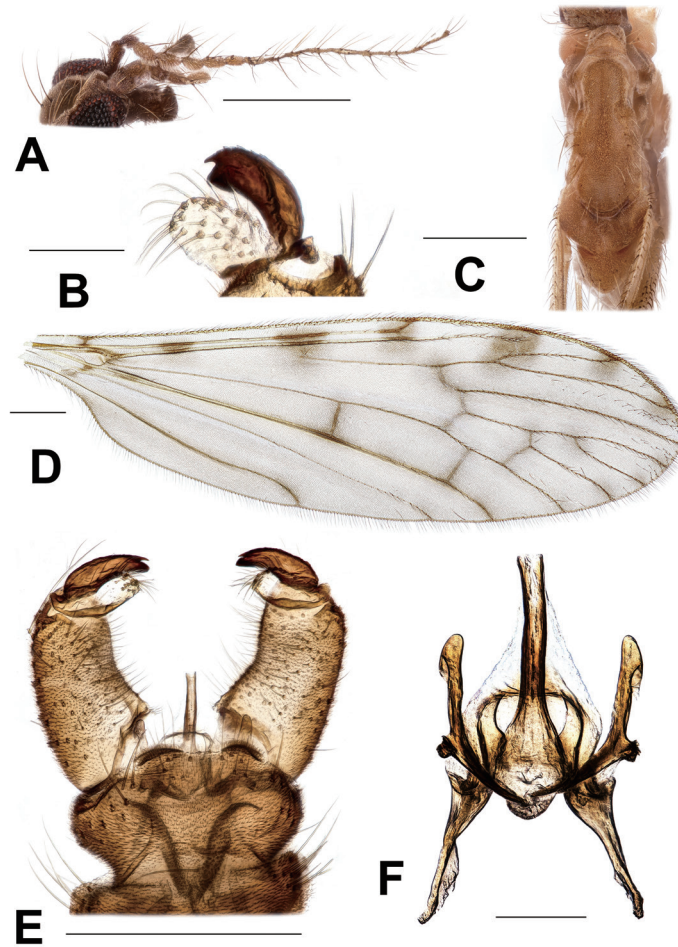


Fig. 16. *Eloeophila apicisetula* Kato, 2021, male, paratype. **A.** Antenna; **B.** Dorsum of thorax; **C.** Gonostyli, fronto-dorsal view; **D.** Wing; **E.** Genitalia, dorsal view; **F.** Aedeagal complex, dorsal view. Scale bars: A, B, D, E = 0.5 mm; C, F = 0.1 mm.

of them with strongly dilated ventral face. The remaining flagellomeres elongate. Apical segment nearly as long as penultimate. Longest verticils twice as long as respective flagellomeres. Rostrum dark brown. Palpus brown. **Thorax.** Dorsal surface, including pronotum, prescutum, scutum and scutellum ochreous. Pronotum more densely covered with grayish pruinosity. Longitudinal stripes on prescutum and presutural scutum indistinct or missing. Posterior margin of scutum lighter grayish. Scutal lobe darker brown, area between lobes grayish. Pseudosutural fovea indistinct, concolorous with surrounding area. Scutellum brownish gray. Mediotergite brown with yellowish lateral margin. Pleuron yellowish brown with darker brown longitudinal stripe extending from head to base of Abdomen. Wing with grayish tinge and darker grayish brown spots. Stigma dark brown. Seven spots at frontal wing margin, dark areas surrounding cord and supernumerary cross-vein in cell *bm*, branching points of veins and tips of longitudinal veins at wing margin. Venation typical



for the genus, radial sector angulate and short-spurred at base, *m-cu* at middle of discal cell, cell *m₁* long, slightly more than twice as long as its stem. Anal vein weakly sinuous. It reaches wing margin beyond level of *Rs* base and slightly before or at supernumerary cross-vein in cell *bm*. Distal wing cells with abundant macrotrichiae. Male wing narrow, not widened along posterior margin, widest at about middle length, slightly beyond tip of anal vein. Male halter 1.0 mm long, obscure yellow with weakly infusate knob. Coxae yellowish brown, trochanters more yellowish. Femur yellow, apex indistinctly and narrowly brownish. Tibia and basitarsi yellow, distal tarsomeres brown. Male femur I: 4.5 mm long, III: 5.0–5.3 mm, tibia I: 4.8 mm, III: 4.7–4.9 mm, tarsus I: 4.2 mm, III: 3.7 mm. **Abdomen.** Dark brown. Male terminalia brown. Epandrium shallowly concave at middle of posterior margin. Concavity wide, surrounded by low rounded blackish lobes on both sides. Gonocoxite elongate, approximately 1.7 times as long as wide, slightly narrows apically. Outer gonostylus elongate, sclerotized, brown. Apex with spine at dorso-posterior margin, lower margin extends into rounded angle. Inner gonostylus oval, pale, fleshy and setose. Paramere with long and narrow posterior process strongly curved subapically and small blunt-apexed blackened lateral lobe at about middle. Aedeagus long and straight, extending far beyond apex of paramere, slightly widened apically. Lateral apodeme long and slender, wider at base. Lateral process of lower shelf gradually narrows towards posterior end. Apodeme of vesica wide and rounded in dorsal view. Sperm pump (vesica) oval.

ELEVATION. From about 400 m to nearly 1000 m.

PERIOD OF ACTIVITY. Whole July and August.

HABITAT. Unknown.

GENERAL DISTRIBUTION. Japan (Honshu).

EXAMINED MATERIAL. Paratype, male (pinned), Japan, Nagano, Sugadaira Montane Research Center, Sugarairakogen, Ueda City, August 20, 2013, D. Kato (NRC); one male (pinned), Japan, Echigo, Mount Naeba, July 1, 1956, K. Baba, Na #20 (USNM).

11. *Eloeophila apiculata* (Alexander, 1919) (Fig. 17, Pl. 3E)

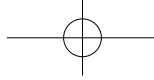
Limnophila (*Ephelia*) *apiculata* Alexander, 1919: 164;

Limnophila (*Eloeophila*) *apiculata* Alexander, 1967: 107, 111;

Eloeophila apiculata Oosterbroek, 2023.

DESCRIPTION. General. Body coloration yellowish brown with dense cover of gray pruinosity on Thorax. Male body length 6.8 mm, that of female 6.1–9.4 mm, male wing length 6.7–8.2 mm, female 8.1–8.9 mm. **Head.** Brownish gray, narrowly paler along eye margin, slightly darker postero-medially, sparsely covered with light brown setae. Some specimens with narrow dark brown line fronto-medially. Male antenna 1.2–1.5 mm long, reaching to about middle of prescutum if bent backwards, female antenna 1.2 mm long. Scape elongate, subcylindrical, brown to dark brown, dusted with yellowish gray. Pedicel brown, paler distally, subglobular. Flagellum light brownish yellow on basal half, turning darker brown towards apex. Six basal flagellomeres oval, slightly dilated ventrally, remaining segments elongate. Apical flagellomere large, subequal in length to preceding segment. Longest verticils up to 1.4 times as long as respective flagellomere. Rostrum



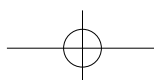


and palpus dark brown, rostrum sparsely dusted with gray dorsally. **Thorax.** Pronotum brownish gray with indistinct darker brown spot dorso-medially. Prescutum and presutural scutum ochreous, sparsely covered with light gray pruinosity and with four dark brown longitudinal stripes. Medial stripes long, separated by narrow light gray or yellowish line. Interspace with line of small dark dots. Pseudosutural fovea distinct, dark brown, angulate, surrounded by yellowish area. Scutal lobe brown, with large dark brown spot at the middle and smaller spot fronto-laterally, narrowly light gray along frontal margin and yellowish along posterior. Area between lobes light yellowish gray with darker spot along middle. Scutellum brown with dense cover of light gray pruinosity, slightly darker frontally and with indistinct darker line medially. Mediotergite light gray, darker laterally. Pleuron dark brown with dense cover of light gray pruinosity and three irregular dark spots. Katepisternum somewhat darker ventrally, meron yellowish. Wing with grayish tinge and distinct pattern of dark brown spots. Frontal wing margin with seven spots, three of these at humeral vein and at tips of veins R3 and R4 small, other four spots large, wider than interspaces, dark areas surround cord and supernumerary cross-vein in cell *bm*, branching points of veins and tips of longitudinal veins at wing margin, wing cells and veins without small dark dots, cells, except frontal wing margin, with grayish, “foggy” areas. Venation typical for the genus, radial sector arcuate at base, *m-cu* at about one third of discal cell’s length, cell *m₁* very long, three times as long as its stem. Anal vein weakly sinuous. It reaches wing margin before the level of supernumerary cross-vein in cell *bm*, but beyond base of *Rs*. Cell *r₄* with few macrotrichiae at wing margin. Male wing not widened along posterior margin, evenly rounded, widest at tip of vein *CuP*. Male halter 1.0–1.4 mm long, that of female 0.9–1.1 mm. Stem of halter brownish with darker base, knob dark brown with pale base. Fore coxa brown, yellowish ventrally, sparsely dusted with gray, middle and posterior coxae brownish yellow. Trochanters obscure yellow. Femur yellow with dark brown apical ring. Tibia and two basal tarsomeres yellow with narrowly and indistinctly darkened apices. Remaining tarsomeres brown. Claw dark brown. Male femur I: 5.2–5.8 mm long, II: 5.3–6.9 mm, III: 6.6–6.7 mm, tibia I: 4.6–6.4 mm, II: 4.5–6.6 mm, III: 6.1–6.7 mm, tarsus I: 3.6–6.0 mm, II: 4.1–4.7 mm, III: 3.8–5.0 mm. Female femur I: 5.7 mm long, II: 6.1 mm, III: 5.0 mm, tibia I: 5.4 mm, II: 5.2 mm, III: 5.0 mm, tarsus I: 4.8 mm, II: 4.9 mm, III: 4.4 mm. **Abdomen.** Basal tergite dark brown, densely gray-dusted. Tergites II–VII light yellowish brown with widely dark brown posterior margin. Pregenital segment dark brown. Sternites, including first segment, lighter than tergites with narrower darkenings along posterior margins. Male terminalia brown. Epandrium slightly extended posteriorly with shallow wide concavity at middle. Gonocoxite elongate, 1.5 times as long as wide at base, slightly widened basally and at middle, apex without tuft of long setae. Outer gonostylus long and narrow, dark brown, apex with strong spine, outer margin at distal third serrate, but without crest, inner margin slightly arched, rounded at distal end. Inner gonostylus pale, fleshy and setose, round-apexed. Paramere with large, wrinkled blade-shaped posterior process and small knob-shaped blackened lateral lobe at about middle. Aedeagus long and straight, extending beyond apex of paramere. Lateral process of lower shelf evenly rounded, not extended, mesal process extends along aedeagus. Lateral apodeme long, slender, blackened. Apodeme of vesica directed ventrally and visible as a blackish spot in dorsal view. Sperm pump (vesica) oval.

ELEVATION. From less than 1200 m to slightly above 1400 m.

PERIOD OF ACTIVITY. From early April through to late July.

HABITAT. Small sandy rapid creeks and rocky streams in deep canyons covered with mixed



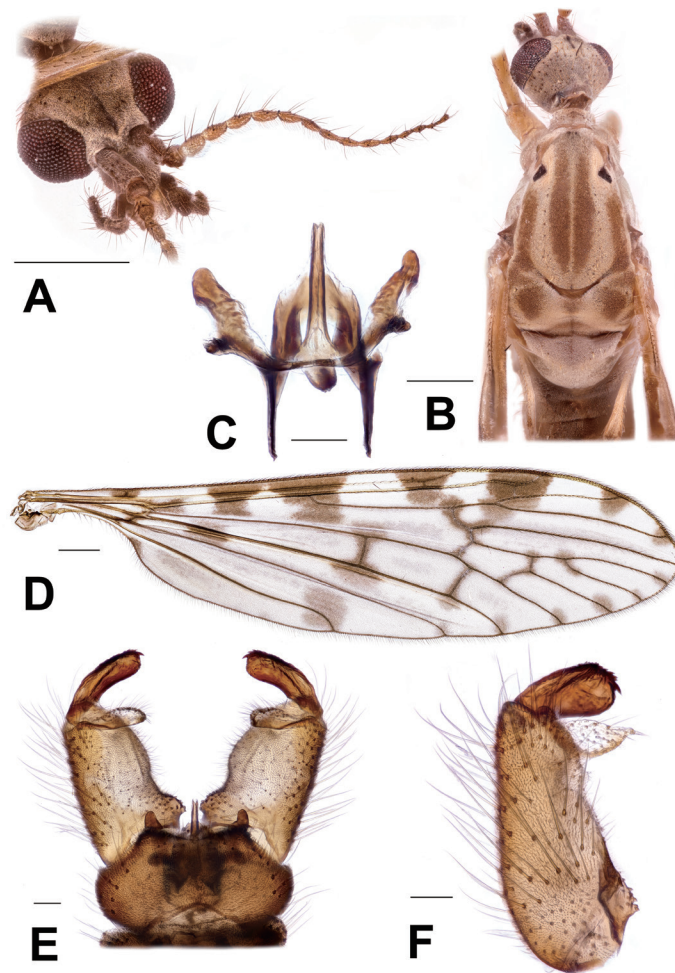


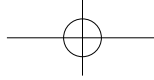
Fig. 17. *Eloeophila apiculata* (Alexander, 1919), male. **A.** Head, dorso-fronto-lateral view; **B.** Head and thorax, dorsal view; **C.** Aedeagal complex, dorsal view; **D.** Wing; **E.** Genitalia, dorsal view; **F.** Gonocoxite with gonostyli, dorso-lateral view. Scale bars: A, B, D = 0.5 mm; C, E, F = 0.1 mm.

trees (large pines, cedars, oaks) and shrubs (rose, blackberry), dense grassy vegetation. This species was found resting on the dark side of boulders with wings closed and abdomen at angle to rock, light catching wing pattern.

GENERAL DISTRIBUTION. USA (California).

EXAMINED MATERIAL. Paratypes, two males (wings, leg and genitalia slide-mounted), USA, California, San Diego Co., Alpine, April 8, 1915, M.C. Van Duzee (USNM); two males (pinned, genitalia in microvials with glycerol on same pins), USA, California, Green Valley, July 26, 1944, A.L. Melander (USNM); two males (pinned, genitalia in microvial with glycerol on same pin), USA, California, Ortega Highway, Mariana River, May 15, 1946, A.L. Melander (USNM); one female (pinned), USA, California, Sequoia, July 20, 1946, C.P. Alexander (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, California, San Benito Co.,





Pinnacles National Monument, April 24, 1948, W.W. Wirth, stream margin (USNM); metatype. male (antenna, leg, wing and genitalia slide-mounted), USA, California, Kern Co., Greenhorn Mts., Cedar Creek Trib. 'B', May 15, 1961, Bellamy (USNM); three males, one female (pinned), USA, California, Kern Co., Alder Ck. Campground, Sequoia National Forest, ±16 km E Glennville on CA#155, 2 km S CA#155, T25S, R31E, 26, 35°43'N, 118°36'30"W, altitude 1189 m, June 19, 1995, J. Gelhaus #620 (ANSP); one male (pinned), USA, California, San Bernardino Co., San Bernardino Mountains along north-flowing tributary of East Fork West Fork Mojave River, 34.265°N, 117.287°W, altitude 1170 m, June 11, 2011, J.N. Hogue, JNH#394, LACM ENT 371940 (CSUN).

REMARK. Differs from *E. modoc* by dark knob of halter.

12. *Eloeophila aprilina* (Osten Sacken, 1860) (Fig. 18, Pl. 3F)

Limnophila aprilina Osten Sacken, 1860: 235;

Limnophila (Elaeophila) aprilina Alexander, 1919b: 1; 1927b: 64; 1943b: 385; 1966: 377, 385; Byers, 2002: 22;

Eloeophila aprilina Oosterbroek, 2023.

DESCRIPTION. General. Body coloration grayish brown to yellowish gray. Male body length 5.2–7.0 mm, female 6.7–7.5 mm. Wing length of male 6.8–8.7 mm, female 7.4–8.5 mm. **Head.** Brown, grayish along eye margin. Male antenna 1.4–1.8 mm long, that of female 1.1–1.3 mm. Both basal antennomeres dark brown, flagellum light brown. Five basal flagellomeres short, dilated ventrally. The remaining flagellomeres elongate. Apical segment short, penultimate 1.4 times as long as apical segment. Longest verticils nearly twice as long as respective flagellomeres. Rostrum brown. Palpus dark brown. **Thorax.** Pronotum brownish gray. Prescutum and presutural scutum with four scarcely indicated brown stripes. Medial stripes separated by narrow yellowish gray line. Stripes not reaching posterior margin of sclerite. Lateral stripes short. Area between medial and lateral stripe as well as area posterior to medial stripes with numerous blackish dots. Presutural area yellowish gray. Scutal lobe grayish brown, area between lobes light gray. Pseudosutural fovea distinct, black, surrounded by yellowish area. Scutellum gray. Mediotergite brown, dusted with gray. Pleuron brown, more densely dusted with gray ventrally. Wing with yellowish tinge and distinct brown spots. Stigma dark brown. Seven spots at frontal wing margin, dark areas surrounding cord and supernumerary cross-vein in cell *bm*, branching points of veins and tips of longitudinal veins at wing margin. Small spot subbasally on vein *M*₃. Venation typical for the genus, radial sector angulate and short-spurred at base, *m-cu* at middle of discal cell, cell *m*₁ long, slightly more than twice as long as its stem. Anal vein weakly sinuous. It reaches wing margin beyond level of *R*_s base at about level of supernumerary cross-vein in cell *bm*. Macrotrichiae missing in distal wing cells. Male wing widened along posterior margin, widest at tip of anal vein. Male halter 0.9–1.0 mm long, that of female 0.9–1.1 mm. Halter obscure yellow with weakly infusate knob. Coxae light brown to yellowish brown, trochanters more yellowish. Femur yellow with narrowly dark brown apex. Tibia yellow with slightly darkened apex. Basal tarsomere yellowish brown, remaining tarsomeres brown to dark brown. Male femur I: 4.4–4.6 mm long, II: 4.5–5.1 mm, III: 4.9–5.4 mm, tibia I: 4.3–4.7 mm, II: 4.1–4.7 mm, III: 4.6–5.3 mm, tarsus I: 4.1–4.6 mm, II: 3.9–4.1 mm, III: 3.6–4.0 mm. Female



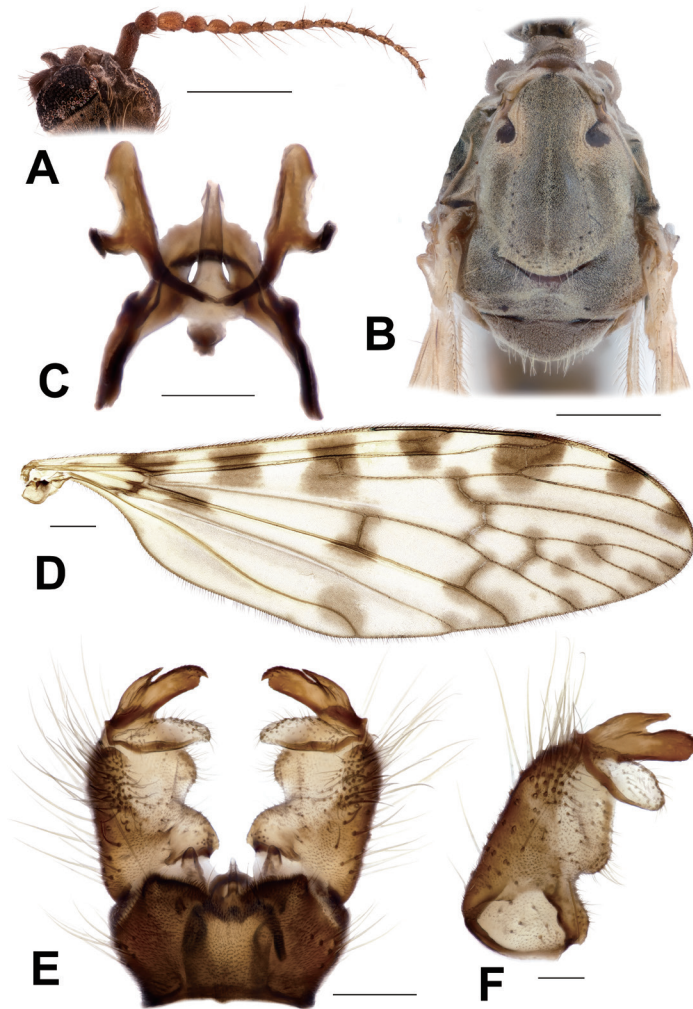
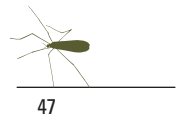
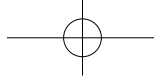


Fig. 18. *Eloephila aprilina* (Osten Sacken, 1860), male. **A.** Head and antenna (Utah); **B.** Dorsum of thorax (Canada); **C.** Aedeagal complex, dorsal view (Canada); **D.** Wing (Canada); **E.** Genitalia, dorsal view (Canada); **F.** Gonocoxite and gonostyli, fronto-dorsal view (Canada). Scale bars: A, B, D = 0.5 mm; C, F = 0.1 mm; E = 0.2 mm.

femur I: 4.5 mm long, II: 4.6–4.8 mm, III: 4.9–5.0 mm, tibia I: 4.6 mm, II: 3.5–4.4 mm, III: 4.2–4.7 mm, tarsus I: 4.8 mm, II: 2.9–3.9 mm, III: 3.3–4.0 mm. **Abdomen.** Tergites brown. Two basal tergites yellowish at base. Sternites yellowish. Segments sparsely dusted with gray and covered with yellowish setae. Male terminalia rusty brown. Epandrium shallowly concave at middle of posterior margin. Concavity wide, surrounded by low angulate lobes on both sides. Gonocoxite elongate with large ventro-mesal lobe. Outer gonostylus elongate, sclerotized, brown, apex with spine. Distal part of outer margin serrate, large point-apexed flange on basal half. Inner gonostylus elongate, pale, fleshy and setose with narrowly darkened anterior margin. Paramere with blade-shaped posterior process and small arched blackened lateral lobe at about middle. Aedeagus short and straight, far not reaching apex of paramere. Lateral process of lower shelf rounded. Lateral apodeme long, and





slender, with subbasal rounded bump. Apodeme of vesica narrow at distal end. Sperm pump (vesica) oval.

ELEVATION. From 650 m to nearly 1000 m.

PERIOD OF ACTIVITY. From late May through to middle of August.

HABITAT. Unknown.

GENERAL DISTRIBUTION. Canada (Newfoundland, Ontario, Quebec), USA (Pennsylvania, South Carolina, Tennessee, Vermont).

EXAMINED MATERIAL. One male (pinned), USA, PA, Hazleton, June 24, 1911, Dr. Dietz (ANSP); one male (pinned), USA, PA, Hazleton, August 11, 1911, Dr. Dietz (ANSP); one male (pinned), USA, PA, Hazleton, August 15, 1911, Dr. Dietz (ANSP); one male (pinned), USA, N.C., Black Mts., May 26, 1912, Dr. Dietz (ANSP); one male (pinned), USA, N.C., Black Mts., July 13, 1912, Dr. Dietz (ANSP); one male, two females (pinned), USA, PA, Hazleton, July 11, 1913, Dr. Dietz (ANSP); one male (pinned), USA, PA, Hazleton, July 16, 1913, Dr. Dietz (ANSP); two females (pinned), USA, Baltimore, Md., June, 1917 (ANSP); one male, two females (pinned), USA, PA, Carbon Co., Palmerton, June 30, 1919, (ANSP); one male, two females (pinned), USA, PA, Carbon Co., Palmerton, July 27, 1920, (ANSP); one male (pinned), USA, Vermont, Stowe, June 20, 1927, C.P. Alexander (BMNH); one male (pinned), Canada, Ontario, Ottawa, June 9, 1931, L.J. Milne (CNC); one male (pinned), USA, New York, Mount Marcy, Heart Lake, altitude 655 m (2150 ft), July 1938, C.P. Alexander (USNM); two males, two females (pinned), USA, New York, Allegany State Park, May 28 – June 3, 1963, W.W. Wirth, light trap (USNM); male (pinned), Canada, Quebec, Abbotsford, May 30, 1968, D.M. Wood (CNC).

13. *Eloeophila bicolorata* (Alexander, 1958) (Fig. 19, Pl. 4A)

Limnophila (*Elaeophila*) *bicolorata* Alexander, 1958b: 156–157; 1960: 173;

Eloeophila bicolorata Oosterbroek, 2023.

DESCRIPTION. General. Body coloration dark gray to black. Male body length 4.8 mm, female 8.0–9.0 mm. Wing length of male 5.5–7.3 mm, female 6.4–7.0 mm. **Head.** Dark gray. Male antenna 1.2–1.5 mm long. Both basal antennomeres dark brown. Flagellomeres distinctly bicolored, basal part of each segment dark brown, distal bright yellow. Darkened part gets wider towards apex of antenna, basal flagellomere with about one third darkened, middle flagellomeres about half dark half yellow, distal flagellomeres with only apical part yellow, about two thirds darkened. Apical flagellomere entirely dark, smaller than preceding segment. Flagellar segments spindle shaped, just apical segment oval. Longest verticils nearly as long as respective flagellomeres. Rostrum and palpus black. **Thorax.** Pronotum gray with narrow black medial line. Prescutum and presutural scutum gray with four indistinct darker stripes. Medial stripes darker posteriorly. Area separating medial and lateral stripes with row of black dots. Fronto-lateral and lateral margins of sclerite distinctly blackened. Scutal lobe brown with black spot in the middle and with wide blackening laterally. Pseudosutural fovea black, surrounded by blackish area. Scutellum densely dusted with gray. Mediotergite densely covered with yellowish gray pruinosity, narrow black line extends along middle. Pleuron dark gray with intense black stripe extending from head to base of abdomen and



separate spots ventrally. Wing whitish with intense dark brown spots. Stigma dark brown. Large broken spots at wing base and distal part of the wing, two broken transverse bands at base of *Rs* extending through supernumerary cross-vein in cell *bm* and reaching posterior wing margin, dark area surrounds cord. Numerous small dots along veins and in wing cells. Veins brown to dark brown, yellow at wing base. Venation typical for the genus, radial sector arched or angulate, *m-cu* at about one-fifths length of discal cell, cell *m*₁ very long, more than 2.5 times as long as its stem. Anal vein arched before wing margin. It reaches wing margin distinctly beyond level of *Rs* base and beyond supernumerary cross-vein in cell *bm*. Distal wing cells without macrotrichiae. Male wing narrow not widened along posterior margin, widest at about middle length, slightly beyond tip of anal vein. Halter with pale stem and blackened knob. Male halter 0.7–1.1 mm long. Coxae black, covered with sparse grayish pruinosity, trochanters brownish yellow. Femur yellow with narrow brown subterminal ring and narrowly pale apex. Tibia and basitarsi yellow, distal tarsomeres dark brown. Male femur I: 4.4 mm long, II: 4.6 mm, III: 4.9 mm, tibia I: 4.4 mm, II: 4.1 mm, III: 4.6 mm, tarsus

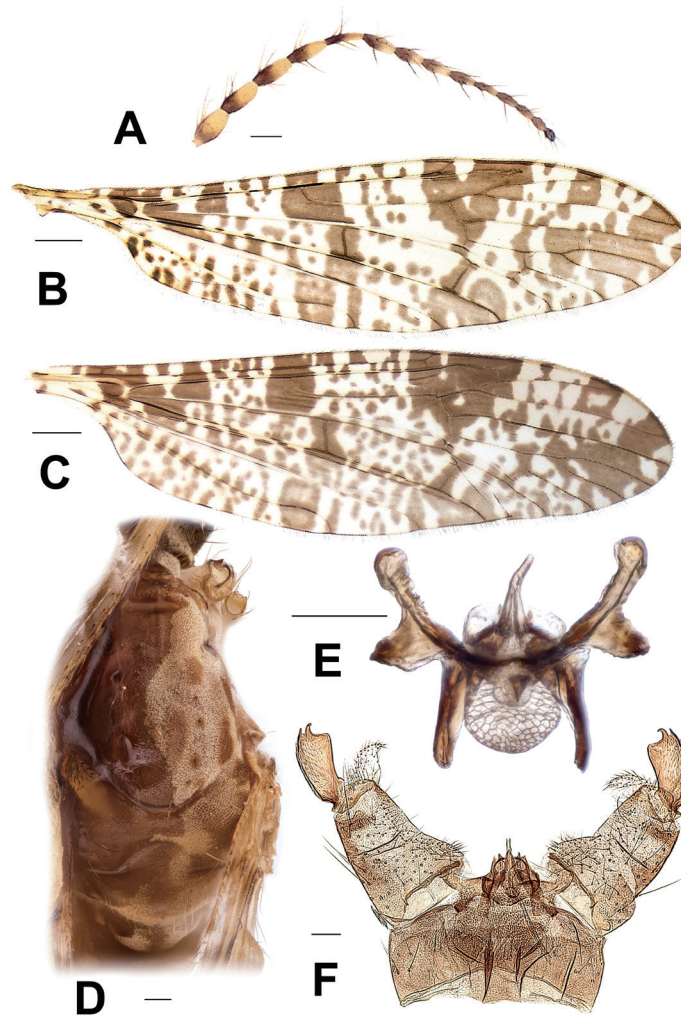
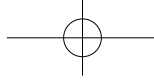


Fig. 19. *Eloeophila bicolorata* (Alexander, 1958). **A.** Female antenna, holotype; **B.** Male wing (India); **C.** Female wing, holotype; **D.** Male thorax, dorsal view; **E.** Male genitalia, dorsal view (India). Scale bars: A, D, E = 0.1 mm; B, C = 0.5 mm.





I: 3.8 mm, II: 3.7 mm, III: 3.2 mm. Female femur I: 4.4–5.2 mm long, II: 5.7 mm, III: 6.2 mm, tibia I: 5.2–5.6 mm, II: 6.0 mm, III: 6.2 mm, tarsus I: 4.6–5.3 mm, II: 5.0 mm, III: 4.5 mm. **Abdomen.** Tergites brownish black, sternites paler along posterior margin. Epandrium shallowly concave at middle of posterior margin. Gonocoxite elongate, approximately 1.7 times as long as width at base, narrows apically, slightly expanded medio-basally. Outer gonostylus elongate, sclerotized, brown. Apex with hook at outer margin and right angle at inner margin. Outer margin extends into apical spine right above hook. Inner gonostylus elongate, pale, fleshy and setose. Paramere with blade-shaped posterior process and short elongate blunt-apexed darkened lateral lobe at about middle. Aedeagus long and straight, extending beyond apex of paramere. Lateral apodeme blade-shaped. Lateral process of lower shelf extends into spine posteriorly. Apodeme of vesica wide and rounded in dorsal view. Sperm pump (vesica) oval.

ELEVATION. From 500 m to slightly above 600 m.

PERIOD OF ACTIVITY. Late March, October through to early December.

HABITAT. Unknown.

GENERAL DISTRIBUTION. India (Assam), Nepal.

EXAMINED MATERIAL. Holotype, female (antenna, middle leg and wing slide-mounted), Nepal, Amlekhgang, altitude 515 m (1690 ft), December 2, 1956, E.I. Coher (USNM); paratype, female (wing and leg slide-mounted), Nepal, Bhainse, December 8, 1956, Coher (USNM); one male (pinned), Nepal, Nayagaon, October 14, 1957, E.I. Coher (USNM); two males (antennae, legs, wings and genitalia slide-mounted), India, Assam, Khasi-Jaintia, Rumkheng, altitude 610 m (2000 ft), March 20, 1960, Schmid (USNM); two males (pinned), India, Assam, Khasi-Jaintia, Rumkheng, altitude 610 m (2000 ft), March 21, 1960, Schmid (USNM).

14. *Eloeophila bifida* (Alexander, 1921) (Fig. 20, Pl. 4B)

Limnophila (*Idioptera*) *bifida* Alexander, 1921: 133–134;

Limnophila (*Elaeophila*) *bifida* Alexander, 1954: 63;

Eloeophila bifida Oosterbroek, 2023.

DESCRIPTION. General. Body coloration brownish black. Male body length about 4.2–5.7 mm, female 6.5 mm. Wing length of male 5.5–7.2 mm, female 6.7 mm. **Head.** Brownish black. Male antenna 1.2–2.1 mm long. Antenna brownish black, turning paler towards apex. Male antenna extending beyond wing base if bent backward. Female antenna extending to wing base if bent backward. Male flagellomeres elongate. Rostrum and palpus brownish black. **Thorax.** Prescutum and presutural scutum dark brown. Dorsopleural membrane pale brown. Pleuron dark brown. Wing grayish with yellowish base and faint darker spots. Stigma darker gray, oval. Darker areas surround base of radial sector and cord. Veins dark brown, yellowish at wing base. Venation typical for the genus, cell *m*₁ approximately as long as its stem, *m-cu* at about one-third length of discal cell. Supernumerary cross-vein in cell *bm* short distance beyond base of radial sector. Male halter 1.0–1.4 mm long, with pale stem, knob slightly infuscated. Coxae obscure yellow, trochanters obscure yellow. Femur light brown with slightly darker tip, tibia light brown with slightly darker tip. Basal tarsomere light brown. Male femur I: 2.1–4.2 mm long, II: 3.7–4.6



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mm, III: 4.4–4.7 mm, tibia I: 2.4–4.9 mm, II: 4.0–4.5 mm, III: 4.3–4.9 mm, tarsus I: 3.6–4.5 mm, II: 3.6–4.0 mm, III: 3.1–4.2 mm. **Abdomen.** Brownish black. Epandrium widely membranous medially, with two oval and densely covered with black spines lobes at middle of posterior margin. Gonocoxite slightly elongate, approximately 1.6 times as long as width at base, narrows apically, with flattened subquadrate darkened lobe at apex that is densely covered with short dark setae, and rounded setose lobe on dorsal side. Outer gonostylus deeply bifid. Dorsal arm plate-shaped, flattened, inner margin with 4–5 small acute teeth. Ventral arm narrow and slightly shorter than dorsal, armed with few acute spinules at tip. Inner gonostylus elongate, pale, fleshy and setose, cleaver-shaped, narrow at base, curved at about right angle at one third length and distinctly wider beyond curve. Apex rounded. Paramere with sickle-shaped posterior process. Aedeagus long and straight, extending beyond distal margin of paramere. Lateral process of lower shelf narrows posteriorly.

ELEVATION. From 1000 m to more than 4200 m.

PERIOD OF ACTIVITY. From early May through to late July.

HABITAT. Unknown.

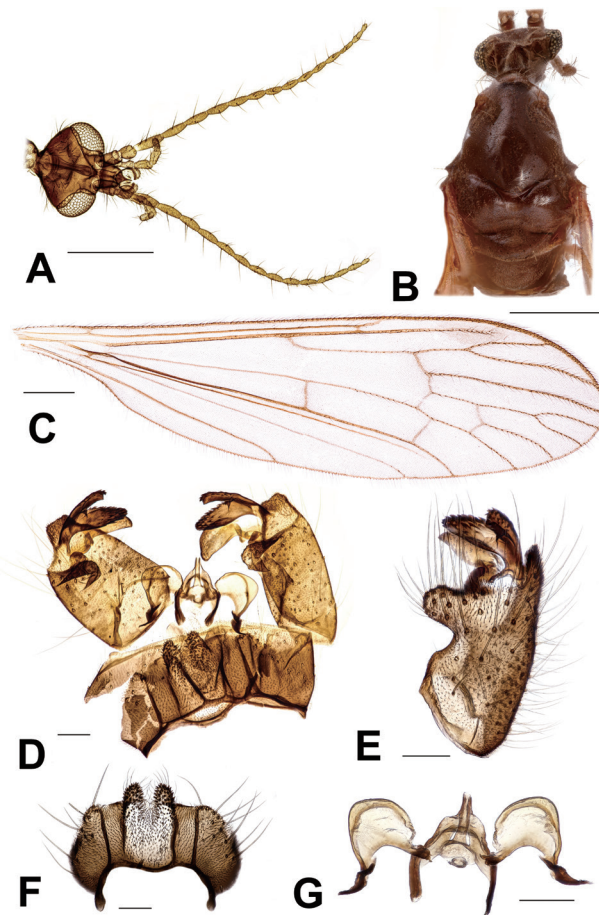
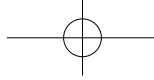


Fig. 20. *Eloeophila bifida* (Alexander, 1921), male. **A.** Gead, dorsal view; **B.** Thorax, dorsal view; **C.** Wing, holotype; **D.** Male genitalia, dorsal view; **E.** Gonocoxite with gonostyles, lateral view; **F.** Epandrium, dorsal view; **G.** Aedeagal complex, dorsal view. Scale bars: A–C = 0.5 mm; D–G = 0.1 mm.





GENERAL DISTRIBUTION. Canada (British Columbia), USA (Idaho, Montana, Oregon).

EXAMINED MATERIAL. Holotype, male (wing and genitalia slide-mounted), USA, Idaho, Moscow Mt., July 25, 1920, R.C. Shannon (USNM); metatype, male (antenna, leg, wing and genitalia slide-mounted), Canada, British Columbia, Fernie, altitude 1006 m (3300 ft), June 5, 1934, H.B. Leech (USNM); three males (pinned, antenna, fore leg, wing and genitalia of one male slide-mounted), USA, Oregon, Yamhill Co., High Heaven, May 4, 1947, K.M. Fender (USNM); metatype, male (abdomen slide-mounted), USA, W. Oregon, Pacific City, May 23, 1948, K.M. Fender (USNM); metatype, one male (antenna, fore leg, wing and genitalia slide-mounted), USA, E. Oregon, Blue Mts., Spring Cr., altitude 4237 m (13,900 ft), June 24, 1948 (USNM); one male (pinned), USA, Oregon, Gunaldo Falls, May 13, 1949, K.M. Fender (USNM); two males (pinned), USA, Oregon, Tierra del Mar, May 13, 1949, K.M. Fender (USNM); one male (pinned), USA, Oregon, Whitney, June 19, 1949, I. Psaker (USNM); one male (slide-mounted), USA, Montana, Missoula Co., Lolo Nat. Forest Bridge, West Fork Butte Creek, 46.7467°N, 114.3159°W, July 1, 2017, A. Fasbender (ANSP); one male (pinned), USA, Montana, Granite Co., Welcome Creek, at Welcome Creek Trailhead, confluence of Welcome Creek and Rock Creek, 46°33'42"N 113°42'8"W, altitude 1241 m, July 8, 2023, J. Gelhaus #1828 et al. (ANSP); seven males, two females (pinned), USA, Montana, Missoula Co., West Fork Butte Creek at Trail# 311 on Forest Service Road #451, Lolo National Forest, 46.7467°N, 114.3159°W, altitude 1173 m, July 9, 2023, J. Gelhaus #1830 et al. (ANSP); one male (pinned), USA, Montana, Missoula Co., Sapphire Mountains (north), MPG Ranch, Lower Tongue Creek, 46.693971°N, 114.014678°W, altitude 1195 m, July 11, 2023, J. Gelhaus #1840 et al., spring run, pond (ANSP); one male (pinned), USA, Montana, Missoula Co., Lee Creek at Forest Service Roads # 699 and 16146, Lolo National Forest, 46°39'58"N, 114°33'10"W, altitude 1585 m, July 14, 2023, J. Gelhaus #1850, et al. (ANSP).

15. *Eloeophila bipartita* Starý, 2009a (Fig. 21, Pl. 4C)

Eloeophila bipartita Starý, 2009a: 431–432; Oosterbroek, 2023.

DESCRIPTION. General. Male wing length 6.2–7.3 mm. **Head.** Dark brown. Male antenna short, reaching only frontal margin of prescutum, if bend backward. Scape elongate, subcylindrical, dark brown, pedicel subglobular, brown, flagellum obscure yellow turning slightly darker towards apex. Flagellomeres oval, covered with dense grayish pubescence, longest verticils nearly twice as long as respective segments, apical flagellomere smaller than preceding segment. Rostrum and palpus brown to dark brown. **Thorax.** Prothorax ochreous with distinct dark brown medial stripe. Prescutum and presutural scutum with four stripes. Median pair long, dark brown, stripes entire, reaching frontal margin of sclerite anteriorly and suture posteriorly. Lateral stripe light brown, interrupted by ochreous area at middle. Lateral margin of prescutum with dark brown margin. Scutal lobe obscure yellow with indistinct brownish spot at middle and paler medial margin. Area between lobes slightly infuscated. Scutellum grayish brown with indistinct darker medial stripe and yellowish gray posterior margin. Mediotergite obscure yellow with rather dense cover of grayish pruinosity. Pseudosutural fovea distinct, brown, widely surrounded by yellowish area. Pleuron brownish yellow with two darker brown spots, one extending along ventral margin of anepisternum,



another at middle of katepisternum. Wing with grayish tinge, brownish at base and along frontal margin. Stigma distinct, elongate, dark brown. Seven dark brown spots, including stigma, smaller than their interspaces, moderate in extent and diffuse, at frontal margin. Less distinct, diffuse spots surround all cross-veins and branching points, small grayish spots or dots distributed along veins, but missing in cells. Veins grayish brown, paler in light areas, yellowish at wing base and in costal field. Venation typical for the genus, radial sector arcuate at base, discal cell small, cell m_1 absent in holotype but present in female paratype that was collected syntopically and synchronously with holotype. Supernumerary cross-vein in cell bm short distance beyond base of radial sector. Anal vein reaching wing margin slightly beyond supernumerary cross-vein in cell bm . Apical wing cells with few macrotrichiae. Wing moderately broad, posterior margin of male wing evenly curved, without widening at tip of anal vein. Male halter 0.9–1.0 mm long, stem pale with brownish base,

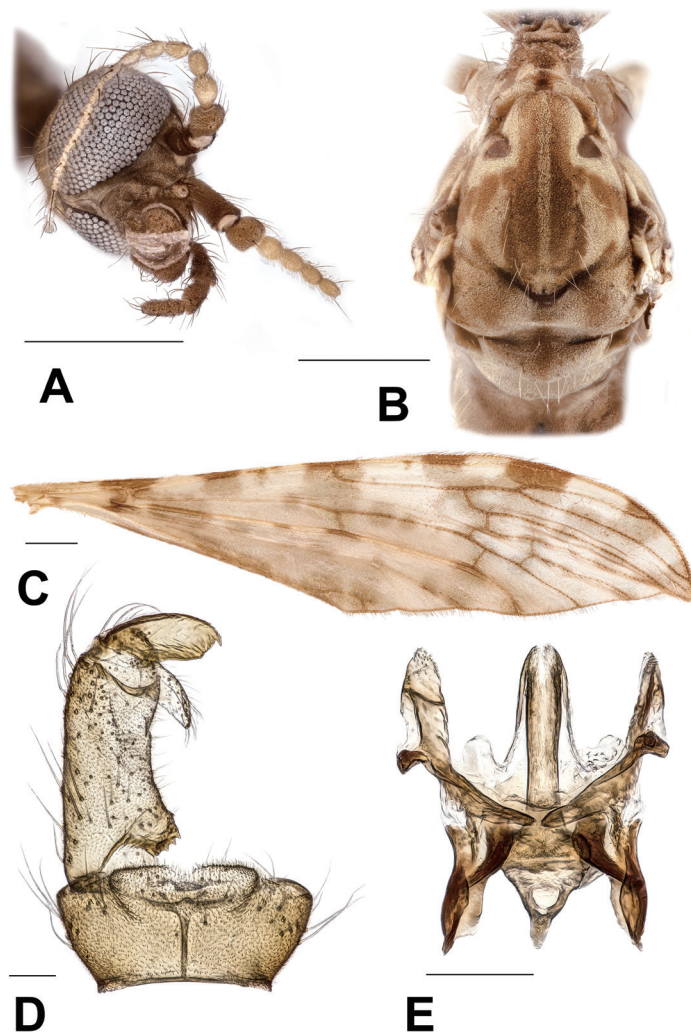
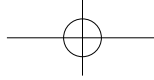


Fig. 21. *Eloeophila bipartita* Starý, 2009a, male, holotype. **A.** Head, lateral view; **B.** Thorax, dorsal view; **C.** Wing; **D.** Genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A–C = 0.5 mm; D, E = 0.1 mm.





knob dark brown. Coxae grayish brown with darker brown markings. Trochanters light brownish gray. Femur obscure yellow with slightly darker tip, covered with setae slightly longer than width of femur itself. Tibia and two basal tarsomeres pale with slightly darkened tips, remaining tarsomeres grayish brown. Male femur I: 4.1 mm long, II: 5.3 mm, tibia I: 4.7 mm, II: 4.1 mm, tarsus I: 4.3 mm, II: 3.7 mm. **Abdomen.** Grayish brown. Tergites with wide brown posterior and lateral margins. Sternites paler than tergites. Epandrium with nearly straight posterior margin. Gonocoxite elongate, approximately twice as long as width at base, slightly narrows towards apex, with small ventromesal lobe armed with three small teeth. Outer gonostylus elongate, blackened, with small apical spine and fine serration distally along outer margin. Crest on outer margin distinct, but because it is at right angle to the main plane of stylus, it is hardly visible in dorsal view. Inner margin broadly rounded, subapical angle not pronounced. Inner gonostylus elongate, fleshy and setose, narrows towards apex. Paramere with elongate and setose posterior process, lateral process short and narrow, slightly arched. Aedeagus distinctly bifid at distal end, stout, reaching to about distal end of paramere. Lateral process of lower shelf extended posteriorly into a sclerotized pincer-like structure, membranous median projection extends posteriorly along aedeagus. Lateral apodeme elongate and twisted plate-shaped. Sperm pump subglobular, anterior apodeme elongate, finger shaped.

ELEVATION. 350 m.

PERIOD OF ACTIVITY. Early May.

HABITAT. Unknown.

GENERAL DISTRIBUTION. Northern Italy.

EXAMINED MATERIAL. Holotype, male (pinned, genitalia in microvial with glycerol on same pin), Italy, Mondovi (CN), Govoni, C. na Sciolla, altitude 350 m, May 3, 2001, G.B. Delmastro (SMOC).

16. *Eloeophila canidorsalis* Kato, 2021 (Fig. 22, Pl. 4D)

Eloeophila canidorsalis Kato, 2021: 430–431; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration grayish dark brown. Male body length 5.1–6.6 mm, female 6.9–8.5 mm. Wing length of male 5.3–6.8 mm, female 6.0–7.1 mm. **Head.** Dark brown, dorsally densely dusted with gray. Anterior vertex with small dark brown spot above bases on antennae. Male antenna 1.0–1.1 mm long, reaching to wing base if bent backwards. Both basal antennomeres dark brown, scarcely dusted with gray. Flagellum brownish yellow. Three basal flagellomeres short, dilated ventrally. Remaining flagellomeres elongate. Apical segment as long as penultimate. Longest verticils twice as long as respective flagellomeres. Rostrum dark brown. Palpus dark brown. **Thorax.** Pronotum brownish gray with narrow dark brown medial line. Prescutum and presutural scutum brownish gray, silverier frontally, yellowish posteriorly, with separated brown spots instead of four longitudinal stripes and with narrow medial line. Scutal lobe brownish yellow, sparsely covered with gray pruinosity, large oblique brown spot at middle. Area between lobes yellowish frontally, brown posteriorly. Pseudosutural fovea distinct, dark brown, surrounded by grayish area. Scutellum brown, pale brown along posterior and lateral margins. Mediotergite brownish gray with dark brown posterior and lateral margins. Pleuron covered with irregular dark



brown spots below wing base and extending from head to base of abdomen, more grayish dorsally, ochreous ventrally. Wing grayish with abundant larger and smaller dark brown spots. Stigma dark brown. Five larger spots at frontal wing margin, interspaces larger than spots. Dark areas surround cord and supernumerary cross-vein in cell *bm*, branching points of veins and tips of longitudinal veins at wing margin. Numerous grayish brown dots equally distributed through wing cells and along veins. Venation typical for the genus, radial sector arcuate at base, *m-cu* at about one third from base of discal cell, cell *m₁* long, twice as long as its stem. Anal vein weakly sinuous. It reaches wing margin beyond level of *Rs* base. Supernumerary cross-vein in cell *bm* at the middle between base of radial sector and tip of anal vein. Macrotrichiae missing in distal wing cells. Male wing slightly widened along posterior margin, widest at tip of anal vein. Male halter 0.9 mm long, obscure yellow with dark brown knob. Coxae dark brown marked with yellowish spots. Fore trochanters obscure yellow, second and third pair dark brown. Femora yellow without darkening at tip. Tibiae yellow

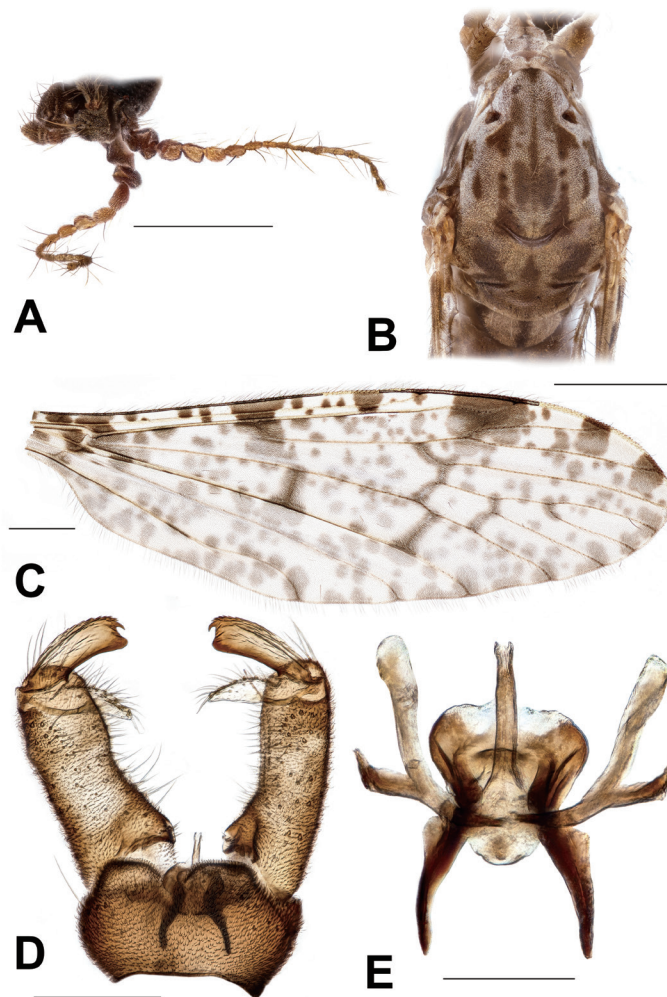
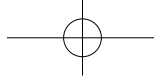


Fig. 22. *Eloeophila canidorsalis* Kato, 2021, male, paratype. **A.** Head and antennae; **B.** Dorsum of thorax; **C.** Wing; **D.** Genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A–D = 0.5 mm; E = 0.1 mm.





with distinct black spurs. Tarsi yellow with black claws. Male femur I: 4.2 mm long, II: 4.4 mm, tibia I: 4.5 mm, II: 4.2 mm, tarsus I: 3.4 mm, II: 3.4 mm. **Abdomen.** Brown with irregular orange lateral spots on distal segments. Segments sparsely dusted with gray and covered with brownish setae. Male terminalia brown. Posterior margin of epandrium with shallow “V”-shaped concavity at middle and wider lateral lobes on both sides. Distal margin of lateral lobe nearly straight, covered with short dense blackish pubescence. Gonocoxite strongly elongate, 2.3 times as long as width at base, slightly dilated at base of ventro-mesal surface. Outer gonostylus strongly elongate, sclerotized, brown along inner and distal margins, pale at base. Apex with spine. Distal part of outer margin serrate. Inner margin ends in a large, rounded extension. Inner gonostylus elongate, pale, fleshy and setose, narrowing towards blunt apex. Paramere deeply bifid, mesal branch twice as long as lateral, mesal round-apexed, lateral point-apexed. Lateral process of lower shelf dilated laterally, rounded. Aedeagus short and straight, reaching to about apex of paramere in dorsal view. Lateral apodeme long, narrows towards apex, dilated at base. Apodeme of vesica small and narrow, directed ventrally, thus not visible in dorsal view. Sperm pump (vesica) subglobular.

ELEVATION. From sea level to nearly 250 m.

PERIOD OF ACTIVITY. From late January to middle of March.

HABITAT. Adults fly not far from the rivers.

GENERAL DISTRIBUTION. Japan (Ryukyu Island).

EXAMINED MATERIAL. Paratype, male (pinned), Japan, Okinawa, Maira-gawa River, Komi, Taketomi-cho, altitude 20 m, May 17, 2016, D. Kato (NRC).

17. *Eloeophila concreta* (Edwards, 1933) (Fig. 23, Pl. 4E)

Limnophila (*Ephelia*) *concreta* Edwards, 1933: 283;

Eloeophila concreta Oosterbroek, 2023.

DESCRIPTION. General. Body coloration gray. Male body length 5.0 mm, wing length 6.5 mm. **Head.** Gray with distinct dark brown medial line and abundant dark brown dots. Vertex covered with long pale setae. Male antenna 1.3 mm long, reaching slightly before wing base if bent backwards. Scape elongate, brown, densely covered with gray pruinosity, pedicel subglobular, brown. Flagellum pale yellow at base, turning brownish towards distal end. Four basal flagellomeres short, dilated ventrally, fifth flagellomere oval, remaining flagellomeres elongate. Apical segment 1.5 times as long as penultimate. Longest verticils nearly twice as long as respective flagellomeres. Rostrum dark brown. Palpus black. **Thorax.** Pronotum dark gray. Prescutum and presutural scutum brownish gray with light gray margins, longitudinal stripes missing or very indistinct, clear dark brown spots instead: oblique streak a little behind fovea, two spots close to each other at about two thirds length of sclerite in front of suture, larger dark spot at posterior end of lateral stripe, and line of four dots in the interspace between medial and lateral stripes. Scutal lobe brownish gray with dark brown spot in the middle. Right scutal lobe of the holotype with large irregular spot, that is broken into two spots on the left lobe. Area between lobes whitish with brown spot in the middle. Pseudosutural fovea distinct, blackish, surrounded by gray area. Scutellum light gray with distinct dark brown medial stripe. Mediotergite gray with dark brown posterior margin. Pleuron dark gray



with irregular dark brown spots. Wing grayish with abundant larger and smaller dark brown spots. Stigma dark brown. Five larger spots at frontal wing margin, interspaces wider than spots. Largest dark areas surround base of radial sector, tip of *Sc* – branching point of *Rs* – base of *R*₅ – base of cell *r*₃ – tip of *R*₁, supernumerary cross-vein in cell *bm* and anal vein opposite base of *Rs*. Abundant smaller spots and dots distributed all over the wing, more abundant along frontal margin. Veins yellowish but marked by dark brown in places surrounded by darker areas. Venation typical for the genus, radial sector angulate at base, *m-cu* at about middle of discal cell, cell *m*₁ long, 1.3 times as long as its stem. Anal vein arched before wing margin. It reaches wing margin far beyond level of *Rs* base. Supernumerary cross-vein in cell *bm* at the middle between base of radial sector and tip of anal vein. Macrotrichiae missing in distal wing cells. Male wing widened along posterior margin, widest at tip of anal vein. Stem of halter pale, knob dark brown to black with pale base. Coxae brown, second coxa with yellowish mark frontally. Trochanters obscure yellow. Femur with darkened tip. **Abdomen.** Male terminalia slightly narrower than pregenital segments. Posterior margin of epandrium rounded. Gonocoxite elongate, nearly twice as long as width at base, slightly dilated mesally at base. Outer gonostylus elongate with deeply bifid distal part, emargination rounded, outer branch spine-shaped, slightly arched, inner branch blunt-apexed. Crest on outer margin distinct, spine-shaped at apex, but because it is at right angle to the main plate of stylus, it is hardly visible in dorsal view. Inner gonostylus elongate, fleshy and setose, narrowing towards blunt apex. Paramere T-shaped in dorsal view, both branches nearly equal in length. Lateral process of lower shelf rounded at distal end. Aedeagus straight and elongate, reaching beyond apex of paramere in dorsal view. Lateral apodeme long and narrow, slightly arched.

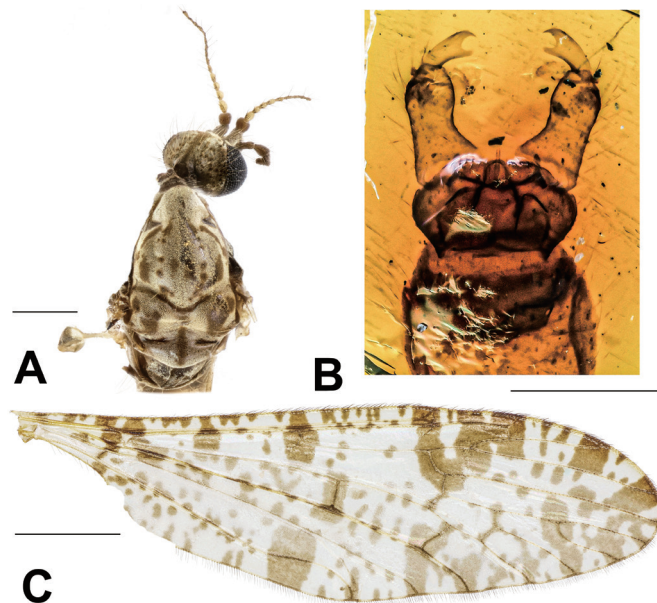
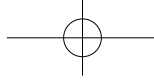


Fig. 23. *Eloeophila concreta* (Edwards, 1933), male, holotype. **A.** Head and thorax, dorsal view; **B.** Wing; **C.** Genitalia, dorsal view. Scale bars: A, C = 0.5 mm; B = 1.0 mm.





ELEVATION. Approximately 1500 m.

PERIOD OF ACTIVITY. Late April.

HABITAT. Unknown.

GENERAL DISTRIBUTION. Malaysia (Borneo).

EXAMINED MATERIAL. Holotype, male (pinned), Malaysia, B.N. Borneo, Mt. Kinabalu, Marei Parei, altitude 1524 m (5000 ft), April 27, 1929, NHMUK010397600 (BMNH).

18. *Eloeophila czernyi* (Strobl, 1909) (Fig. 24, Pl. 4F)

Ephelia czernyi Czerny & Strobl, 1909: 140–141;

Eloeophila czernyi Savchenko et al., 1992: 218; Eiroa, Baez, 2002: 54; Starý, 2004; 2009a: 428–429; Bilgin et al., 2015: 3, 6, 7, 8; Oosterbroek, 2023.

DESCRIPTION. General. Body brown, sparsely covered with gray pruinosity. Male body length 7.0 mm. Wing length of both male and female 6.5–8.7 mm. **Head.** Dark brown, dusted with gray. Male antenna 1.5–1.6 mm long, reaching to frontal margin of prescutum if bent backwards. Both basal antennomeres dark brown, scarcely covered with gray pruinosity. Flagellum brown, bases of three basal flagellomeres narrowly yellowish. Four basal flagellomeres short, dilated ventrally. Remaining flagellomeres elongate. Apical segment slightly exceeding penultimate in length. Longest verticils 1.3 times as long as respective flagellomeres. Rostrum brown, sparsely covered with gray pruinosity. Palpus dark brown. **Thorax.** Pronotum yellowish brown with dark brown medial line. Prescutum and presutural scutum yellowish brown with four dark brown longitudinal stripes. Medial stripes not reaching suture, separated by brown line narrower than stripe itself. Lateral stripe less distinct, accompanied by dark spot beyond fovea. Intermediate area between medial and lateral stripes with row of dark brown dots. Scutal lobe brownish gray, yellowish laterally, with triangle-shaped dark brown spot at middle and indistinct small spot laterally. Area between lobes pale with indistinct brownish medial line and dark spot postero-medially. Pseudosutural fovea distinct, dark brown, surrounded by yellowish area. Scutellum brownish yellow with dark brown spot fronto-medially. It makes short stripe together with postero-medial spot between scutal lobes. Mediotergite light brownish gray with very indistinct darker line along middle. Pleuron brown, dusted with brownish gray. Wing with grayish tinge, yellowish at base and in costal area, patterned with abundant larger and smaller dark brown spots. Stigma dark brown. Seven large spots at frontal wing margin, wider than interspaces. Largest dark areas at wing base, at the middle between arculus and base of *Rs*, at base of *Rs*, at *sc-r*, behind stigma, at tips of *R*₃ and *R*₄. Less distinct darker areas surround cross-veins and branching points of veins. Numerous grayish brown dots equally distributed along veins starting from vein *bm*, but missing on *C*, *Sc* and *R*, including *Rs* (single dot on *Rs*, Fig. 24C). Venation typical for the genus, radial sector arcuate at base, *m-cu* slightly before middle of discal cell, cell *m*₁ long, 1.8 times as long as its stem. Anal vein short-spurred and arched before wing margin. It reaches wing margin at the level of supernumerary cross-vein in cell *bm* and beyond base of *Rs*. Few macrotrichiae present in distal wing cells. Male wing narrow, not widened along posterior margin, widest at tip of vein *CuP*. Male halter 1.0–1.3 mm long. Stem of halter obscure yellow, knob dark brown. Coxae rusty brown, trochanters yellowish brown. Femur yellow with



wide and distinct dark brown ring at tip. Tibiae yellow with narrowly darkened tip. Basal tarsomere yellow at base, turning brown towards tip, remainder of tarsus brown to dark brown. Legs covered with comparatively long dark brown setae. Male femur I: 5.1 mm long, II: 6.2 mm, III: 6.0–6.5 mm, tibia I: 5.3 mm, II: 5.8 mm, III: 5.4–6.4 mm, tarsus I: 4.4 mm, II: 5.3 mm, III: 5.7 mm. **Abdomen.** Tergites dark brown with yellowish spot at middle of frontal margin, pregenital tergite entirely dark brown. Sternites brownish yellow with widely dark brown posterior and lateral margins. Male terminalia rusty brown. Posterior margin of epandrium nearly straight, densely covered with blackish pubescence. Gonocoxite elongate, twice as long as width at base, slightly dilated at base of ventromesal surface, mesal margin armed with three sharp teeth. Outer gonostylus wide, sclerotized, dark brown. Apex with spine. Distal part of outer margin serrate. Inner margin with right angle beneath spine. Crest on outer margin distinct, but hardly visible in dorsal view, terminal spine small. Inner gonostylus elongate, pale, fleshy and setose, narrowing towards blunt apex. Paramere with

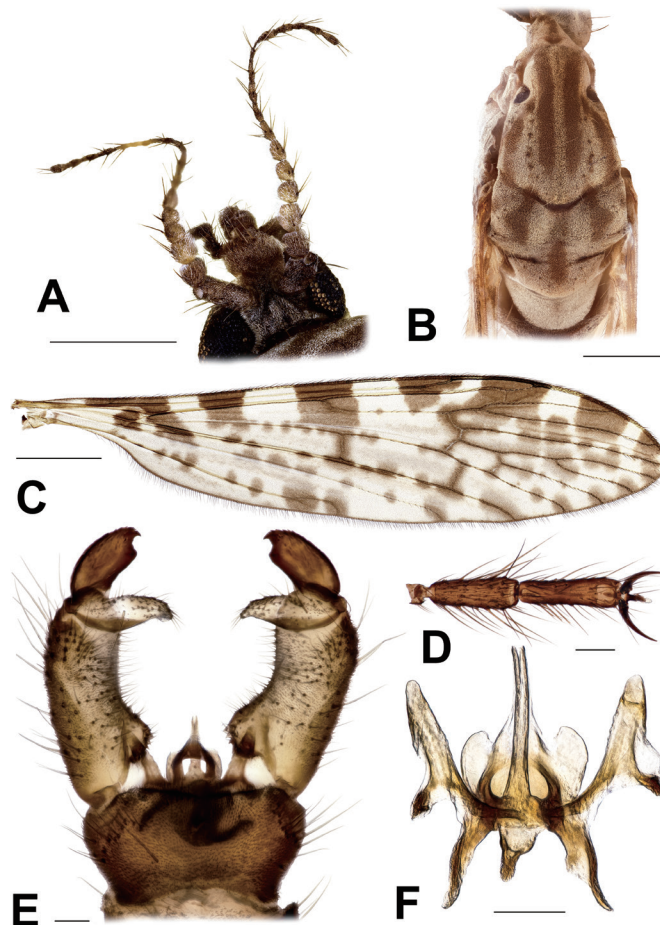
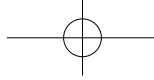


Fig. 24. *Eloeophila czernyi* (Strobl, 1909), male, Corsica. **A.** Head and antennae; **B.** Dorsum of thorax; **C.** Wing; **D.** Distal tarsomeres; **E.** Genitalia, dorsal view; **F.** Aedeagal complex, dorsal view. Scale bars: A, B = 0.5 mm; C = 1.0 mm; D–F = 0.1 mm.





two branches, mesal branch plate-shaped, twice as long as lateral. Lateral branch narrow, curved, blackened apically. Lateral process of lower shelf dilated laterally, plate-shaped. Aedeagus long and straight, reaching distinctly beyond apex of paramere in dorsal view, bifid at apex. Lateral apodeme long, darkened along outer margin, plate-shaped basally, narrow, finger-shaped distally. Sperm pump (vesica) oval. Apodeme of vesica long and narrow, darkened.

ELEVATION. From 200 m to nearly 1300 m.

PERIOD OF ACTIVITY. From early April through to beginning of November.

HABITAT. Alder tree forests near rivers. Species is attracted to light.

GENERAL DISTRIBUTION. Algeria, France (Corsica), Italy (Sardinia, Sicily), Turkey (Asiatic part: Eskisehir).

EXAMINED MATERIAL. One male (pinned), Algeria, Eaton, 94.114, Fort National, November 2, 1892 (BMNH); one male (pinned), France, Corsica, April 10–25, 1928, F.W. Edwards, B. M. 1928–214 (BMNH); one male (in ethanol, wing and genitalia slide-mounted), France, Corsica, Tavera, altitude 400 m, *Alnus* forest near river, St. 11 at light, Menhis (MHNN).

19. *Eloeophila delicola* (Alexander, 1962) (Fig. 25, Pl. 5A)

Limnophila (*Elaeophila*) *delicola* Alexander, 1962: 186–188;

Eloeophila delicola Oosterbroek, 2023.

DESCRIPTION. General. Body dark brown. Male body length 6.8 mm, wing length 8.3–8.8 mm. Female body length 8.6–10.0 mm, wing length 9.5–10.7 mm. **Head.** Gray with broad brownish black medial line extending through vertex and occiput. Male antenna 1.3 mm long, female antenna 1.4–1.6 mm. Both basal antennomeres black. Basal flagellomeres light yellow, oval, distal elongate and slightly darkened. Verticils long, especially on outer flagellar segments. Rostrum black. Palpus black. **Thorax.** Pronotum dark brown. Prescutum and presutural scutum light brown, patterned with dark spots and lines: along lateral margin, lateral stripe, intermediate and medial lines frontally, small intermediate dots posteriorly. Pseudosutural fovea brown. Scutal lobe brownish yellow with brown spot. Scutellum bright yellow with dark brown spot laterally. Mediotergite densely covered with gray pruinosity. Pleuron dark brown, interspaced by yellowish gray areas with denser cover of pruinosity. Wing with yellowish tinge, yellow at base, in costal area and along veins. Wing pattern includes distinct dark brown spots, but small dots along veins and in cells missing. Most distinct spots: “U”-shaped at wing base; transverse arched line at base of *Rs* and supernumerary cross-vein in cell *bm*; “Y”-shaped, going through tip of *Sc*, *sc-r*, branching point of *Rs*, along cord and *R*₂; along distal margin of discal cell; oblique line starting from tip of *R*₁ and reaching *M*₂; small spots at tips of all longitudinal veins along posterior wing margin. Stigma brown. Veins yellow, buffy closer to wing margin. Venation: radial sector arcuate at base, supernumerary cross-vein slightly beyond base of radial sector, *m-cu* close to the base of discal cell, cell *m*₁ very long, 4.2 times as long as its stem, veins *M*₁ and *M*₂ arched before wing margin. No macrotrichiae present in distal wing cells. Male wing dilated along posterior margin, widest at tip of anal vein. Male halter 1.1 mm long, female 1.3 mm. Stem of halter yellow, knob brownish black with paler base. Coxae dark brown, trochanters brown. Femur light yellow with black subterminal ring and rusty tip. Tibia yellow with narrowly



brownish black tip. Three basal tarsomeres yellow with darkened tips, remainder of tarsus brownish black. Male femur I: 5.3–5.4 mm long, III: 5.7–5.8 mm, tibia I: 5.4–6.1 mm, III: 5.2–5.6 mm, tarsus I: 5.1–5.2 mm, III: 4.6–4.9 mm long. Female femur I: 4.5–5.6 mm long, II: 5.4 mm, III: 6.0–6.8 mm, tibia I: 5.3–5.8 mm, II: 4.9 mm, III: 6.2–6.5 mm, tarsus I: 5.0–5.7 mm, II: 4.5 mm, III: 4.1–4.9 mm. **Abdomen.** Tergites dark brown, blackened along lateral margin. Sternites light yellow, dark brown along posterior and lateral margins.

ELEVATION. From 2100 m to slightly above 3000 m.

PERIOD OF ACTIVITY. From mid-May through to late August.

HABITAT. Unknown.

GENERAL DISTRIBUTION. India (Assam, Sikkim).

EXAMINED MATERIAL. Holotype, female (wing and hind leg slide-mounted), India, Sikkim, Karponang, altitude 3017 m (9900 ft), August 23, 1959, F. Schmid (USNM); one male (pinned), India, Assam, NEFA-Kameng, Nyuk-Madong, altitude 2438 m (8000 ft), April 20, 1961, F. Schmid

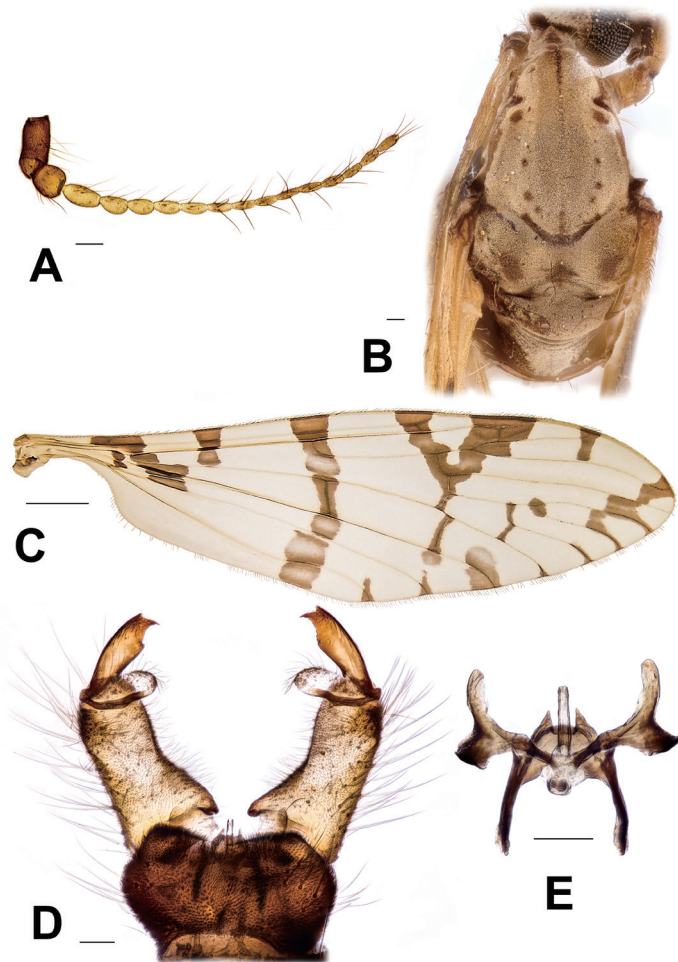
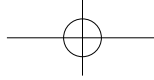


Fig. 25. *Eloephila delicola* (Alexander, 1962). **A.** Female antenna; **B.** Male thorax, dorsal view; **C.** Female wing; **D.** Male genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A, B, D, E = 0.1 mm; C = 1.0 mm.





(USNM); one male (pinned), India, Assam, NEFA-Kameng, Talung Dzong, altitude 2134 m (7000 ft), May 12, 1961, F. Schmid (USNM); one female (pinned), India, Assam, NEFA-Kameng, Talung Dzong, altitude 2134 m (7000 ft), May 14, 1961, F. Schmid (USNM); one female (antenna, wing, fore and hind legs slide-mounted), India, Assam, NEFA-Kameng, Jhum La, altitude 2377 m (7800 ft), May 14, 1961, F. Schmid (USNM); one female (antenna, fore leg and wing slide-mounted), India, Assam, NEFA-Kameng, Bondi La, altitude 2682 m (8800 ft), June 17, 1961, F. Schmid (USNM).

20. *Eloeophila delmastroi* Starý, 2009a (Fig. 26, Pl. 5B)

Eloeophila delmastroi Starý, 2009a: 432; Oosterbroek, 2023.

DESCRIPTION. Male. General. Body dark brown, sparsely covered with gray pruinosity (specimen was dried from ethanol, thus color could be somewhat affected). Male body length 6.3 mm. Wing length 7.1–8.5 mm. **Head.** Dark brown, paler along eye margin. Male antenna 1.3–1.6 mm long, nearly reaching wing base if bent backwards. Scape elongate, nearly cylindrical, dark brown, covered with sparse gray pruinosity dorsally. Pedicel brown, subglobular. Flagellum buffy, turning darker towards apex. Four basal flagellomeres short, dilated ventrally. Remaining flagellomeres elongate. Apical segment 1.5 times as long as penultimate. Longest verticils 1.9 times as long as respective flagellomeres. Rostrum and palpus dark brown. **Thorax.** Pronotum buffy with distinct dark brown medial line. Prescutum and presutural scutum brownish yellow frontally, grayish posteriorly, with four dark brown longitudinal stripes. Medial stripes wider and darker at frontal margin of sclerite, but not reaching suture posteriorly, separated by grayish line narrower than stripe itself. Lateral stripe accompanied by dark oblique spot beyond fovea frontally, reaching suture posteriorly. Intermediate areas between medial and lateral stripes with row of dark brown dots connected along posterior margin of sclerite and forming “U” shape. Scutal lobe brownish gray, with small darker brown spot at posterior margin. Area between lobes light yellowish gray with narrow dark brown line postero-medially. Pseudosutural fovea distinct, black, surrounded by yellowish area. Scutellum brownish gray with dark brown spot fronto-medially. It makes short stripe together with postero-medial spot between scutal lobes. Mediotergite light brownish gray. Pleuron grayish brown with irregular dark brown spots where pruinosity is denuded. Wing whitish, yellowish at base and along costal area, patterned with abundant larger and smaller dark brown spots. Stigma dark brown. Seven largest spots at frontal wing margin. Less distinct darker areas surround cross-veins and branching points of veins. Numerous grayish brown dots along longitudinal veins. Veins yellow, but dark brown in darkened areas. Venation typical for the genus, radial sector arcuate at base, *m-cu* approximately at middle of discal cell, cell m_1 long, about twice as long as its stem. Anal vein short-spurred and arched before wing margin. It reaches wing margin beyond the level of supernumerary cross-vein in cell *bm*, which lies beyond base of *Rs*. Few macrotrichiae present in distal wing cells. Male wing slightly widened along posterior margin, widest slightly before tip of anal vein. Male halter 1.1 mm long. Stem of halter pale yellow, knob dark brown with pale base. Coxae dark brown with yellowish markings, more intense on frontal pair. Fore and middle trochanter yellowish brown, posterior dark brown. Femur yellow with wide and distinct dark brown ring at tip. Tibia yellow



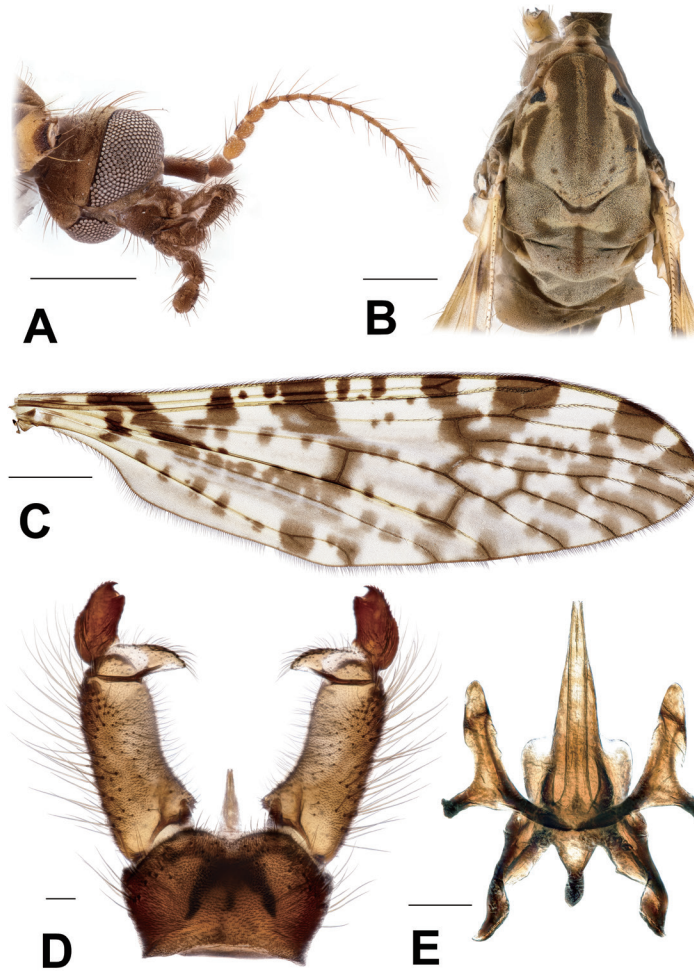
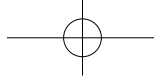


Fig. 26. *Eloeophila delmastroi* Starý, 2009a, male, paratype. **A.** Head and antenna; **B.** Dorsum of thorax; **C.** Wing; **D.** Genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A, B = 0.5 mm; C = 1.0 mm; D, E = 0.1 mm.

with narrowly darkened tip. Basal tarsomere yellow at base, turning brown towards tip, remainder of tarsus brown to dark brown. Legs covered with comparatively long dark brown setae. Male femur III: 6.5–6.8 mm long, tibia III: 6.7–7.0 mm, tarsus III: 4.7–5.2 mm. **Abdomen.** Tergites dark brown with brownish spot at middle of frontal margin, sternites with large light yellow spot fronto-medially. Pregenital segment entirely dark brown. Male terminalia rusty brown. Posterior margin of epandrium with two low rounded lobes and wide shallow emargination at middle between them. Gonocoxite elongate, twice as long as width at base, slightly dilated at base of ventro-mesal surface, mesal margin armed with three small teeth. Outer gonostylus wide, sclerotized, dark brown. Apex with spine. Distal part of outer margin serrate. Inner margin extended into an angle beneath spine. Crest on outer margin distinct, but hardly visible in exactly dorsal view, terminal spine small. Inner gonostylus elongate, pale, fleshy and setose, narrowing towards apex. Paramere with two branches, mesal branch plate-shaped, twice as long as lateral. Lateral branch narrow, curved, blackened





apically. Lateral process of lower shelf slightly dilated laterally, plate-shaped, median projection of lower shelf extended posteriorly as flange of aedeagus. Aedeagus very long and straight, reaching distinctly beyond apex of paramere in dorsal view, narrowing towards apex. Lateral apodeme long, darkened and curved. Sperm pump (vesica) oval. Apodeme of vesica elongate and blackened.
Female. unknown.

ELEVATION. All specimens were captured at altitudes between 250 m and 300 m.

PERIOD OF ACTIVITY. It is possible that the species has two generations a year, one flying from mid-March through to early May, second through August to late September.

HABITAT. Unknown.

GENERAL DISTRIBUTION. Northern Italy.

EXAMINED MATERIAL. Paratype, male (pinned), Italy, Villafranca Piemonte (TO), Cappella di Missione, altitude 260 m, August 10, 1999, G.B. Delmastro leg. (NRC).

21. *Eloeophila diacis* (Alexander, 1972) (Fig. 27, Pl. 5C)

Limnophila (*Eloeophila*) *diacis* Alexander, 1972: 7–8;

Eloeophila diacis Oosterbroek, 2023.

DESCRIPTION. General. Male body length 5.5–5.8 mm, wing length 5.6–7.3 mm. **Head.** Light gray. Male antenna 1.3–1.5 mm long. Both basal antennomeres brownish black. Flagellar segments bicolored, yellow with narrowly dark brown bases, oval. Verticils long. Rostrum brownish gray, palpus black. **Thorax.** Pronotum obscure yellow with darkened lateral margin. Prescutum yellowish gray, prescutum and presutural scutum with three brownish black longitudinal stripes. Scutal lobes and scutellum covered with gray pruinosity. Mediotergite with narrow black line along middle. Pleuron gray with dark brown stripe extending from head to the base of Abdomen. Wing with grayish tinge, yellow at base, patterned with abundant larger and smaller dark brown spots. Stigma dark brown. Seven large spots at frontal wing margin. Two of them at base of *Rs* – supernumerary cross-vein in cell *bm* and at cord extend towards posterior wing margin and make transverse sutures. Large spot at tip of vein *CuA* along posterior wing margin. Numerous small dots along veins and in all wing cells. Veins dark brown, narrowly interrupted by pale yellow in translucent areas, yellow at wing base. Venation typical for the genus, radial sector angulate and short-spurred at base, *m-cu* approximately at about one-fifths of discal cell's length, cell *m₁* long, 1.9 times as long as its stem. Supernumerary cross-vein in cell *bm* at middle between base of *Rs* and tip of anal vein. Anal vein slightly arched before wing margin. No macrotrichiae present in distal wing cells. Male wing not widened along posterior margin, widest at tip of vein *CuP*. Stem of halter brownish yellow with brighter yellow base, knob brownish black. Male halter 1.1 mm long. Coxa brownish yellow, dusted with gray. Trochanter brownish yellow, dusted with gray. Femur yellow with wide and distinct brownish black ring at distal end, tip slightly paler. Tibia and tarsus yellow. Male femur I: 4.1 mm long, II: 4.5 mm, tibia I: 5.1 mm, II: 4.8 mm, tarsus I: 4.5 mm, II: 4.2 mm. **Abdomen.** Tergites and sternites dark brown with yellowish spot at middle. Pregenital segments entirely dark brown. Outer gonostylus of male genitalia widens toward distal part, sclerotized, dark brown. Distal margin with spine terminating outer margin and rounded lobule at distal end of inner



margin. Distal part of outer margin serrate. Crest on outer margin with conspicuous appressed spine at about two-thirds of style's length. Distal part of inner gonostylus curved at right angle. Mesal branch of paramere wide, plate-shaped, reaching slightly beyond base of aedeagus. Lateral branch short and rounded. Lateral process of lower shelf strongly elongate, spine-shaped, reaching slightly beyond tip of aedeagus. Aedeagus long and straight, bifid at apex. Sperm pump (vesica) oval. Apodeme of vesica short, blackened with bifid apex.

ELEVATION. From nearly 1600 m to 2300 m.

PERIOD OF ACTIVITY. From beginning of May through to early July.

HABITAT. Unknown.

GENERAL DISTRIBUTION. India (Assam, Uttarakhand).

EXAMINED MATERIAL. Holotype, male (wing, legs and genitalia slide-mounted), India, Kumaon, Pauri Garhwal, Lata, altitude 2286 m (7500 ft), July 6, 1958, F. Schmid (USNM); paratype, male (head, fore leg, wing and abdomen slide-mounted), topotypic (USNM); paratypes, two males (pinned, antenna, legs, wing and genitalia of both specimens on same slide), India, Kamong, NEFA, Rupa, altitude 1585–1676 m (5200–5500 ft), May 2–3, 1961, F. Schmid (USNM).

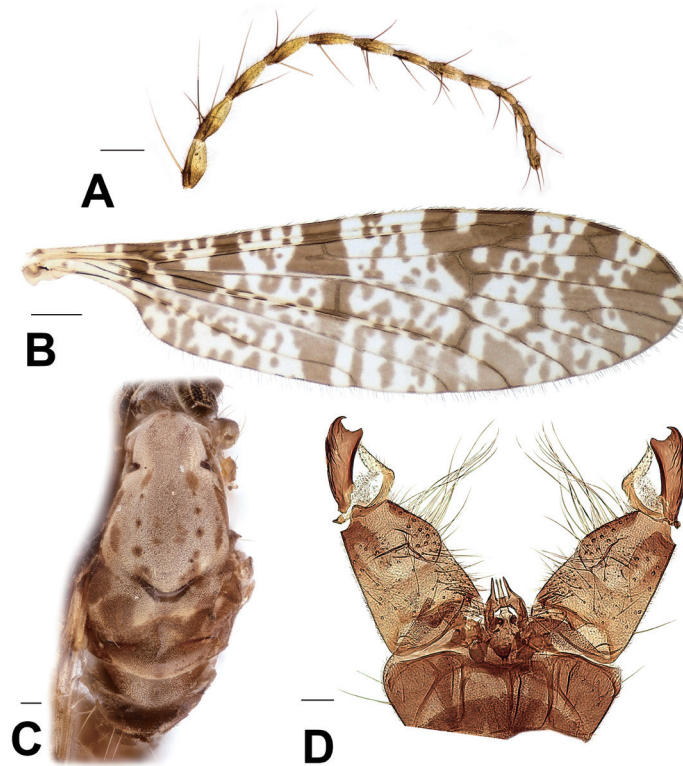
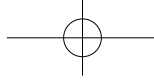


Fig. 27. *Eloeophila diacis* (Alexander, 1972), male. **A.** Flagellum of antenna, paratype; **B.** Wing, holotype; **C.** Thorax, dorsal view; **D.** Genitalia, dorsal view, holotype. Scale bars: B = 0.5 mm; A, C, D = 0.1 mm.





22. *Eloeophila dietziana* (Alexander, 1925) (Fig. 28, Pl. 5D)

Limnophila (*Ephelia*) *dietziana* Alexander, 1925a: 437–438; 1930a: 507; 1931: 340;

Limnophila (*Elaeophila*) *dietziana* Alexander, 1953: 167;

Eloeophila (*Eloeophila*) *dietziana* Savchenko & Krivolutskaya, 1976: 61;

Eloeophila dietziana Nakamura et al., 2014: 12; Kato, 2021: 432–433; Oosterbroek, 2023.

DESCRIPTION. General. Body dark brown, dusted with gray. Male body length 3.6–4.8 mm, female 6.9 mm, male wing length 4.5–6.3 mm, female 6.0 mm long. **Head.** Brownish gray, darker posteriorly, vertex with dark brown medial line. Male antenna 1.1–1.7 mm long, nearly reaching wing base if bent backwards. Female antenna 1.2 mm long. Scape elongate, dark brown. Pedicel brown, subglobular. Flagellum yellow, turning darker towards apex, basal parts of flagellomeres narrowly darkened. Flagellar segments elongate, turning shorter towards apex, two basal flagellomeres slightly dilated ventrally. Apical segment approximately same size as penultimate. Longest verticils 1.4 times as long as respective flagellomeres. Rostrum and palpus brownish black. **Thorax.** Pronotum light gray with distinct dark brown medial line. Prescutum and presutural scutum yellowish-grayish brown, patterned with dark brown stripes, spots and dots, but usual longitudinal stripes missing. Scutal lobe concolorous with presutural scutum with large dark brown spot reaching posterior margin. Area between lobes paler with dark brown spot postero-medially. Pseudosutural fovea distinct, dark brown, surrounded by light gray area. Scutellum brown with dark brown spot fronto-medially. It makes short stripe together with postero-medial spot between scutal lobes. Mediotergite gray, distinctly darkened along posterior margin. Pleuron gray, spotted with dark brown. Wing whitish, yellowish at base and along costal area, patterned with abundant larger and smaller dark brown spots: distinct transverse suture at the level of base of radial sector and supernumerary cross-vein in cell *bm*, large “U”-shaped spot at tips of *Sc* and *R*₁ and extending to branching point of *Rs*, large spot at wing apex. Numerous small dots evenly distributed along veins and in all cells. Stigma dark brown. Veins mostly dark brown, but yellowish at wing base and in places surrounded by translucent or whitish areas. Venation typical for the genus, radial sector angulate and short-spurred at base, *m-cu* approximately at middle of discal cell, cell *m*₁ rather short, approximately as long as its stem. Anal vein slightly sinuous. It reaches wing margin beyond the level of supernumerary cross-vein in cell *bm*. No macrotrichiae present in distal wing cells. Male wing widened along posterior margin, widest at tip of anal vein. Male halter 0.7–1.1 mm long, female 0.7 mm long. Stem of halter brownish yellow, knob dark brown. Coxae brown, fore pair with yellowish markings frontally and laterally. Fore and middle trochanters brown with yellowish markings, posterior darker brown. Femur yellow, narrowly pale at base, with wide and distinct dark brown ring at tip. Tibia yellow with narrowly darkened tip. Two basal tarsomeres yellow with narrowly darkened tips, remainder of tarsus brown. Male femur I: 3.5–4.1 mm long, II: 3.6–4.7 mm, III: 4.0–4.1 mm, tibia I: 3.4–4.9 mm, II: 3.4–4.4 mm, III: 3.8–3.9 mm, tarsus I: 3.1–3.7 mm, II: 3.1–3.4 mm, III: 2.8–3.6 mm. Female femur I: 4.2 mm long, II: 4.4 mm, tibia I: 4.2 mm, II: 3.6 mm, tarsus II: 4.6 mm. **Abdomen.** Dark brown, tergites and sternites at middle of abdomen paler at base, thus posterior and lateral margins widely darker brown. Male terminalia lighter brown. Posterior margin of epandrium darkened with wide but shallow emargination at middle, both sides of it slightly extended posteriorly. Gonocoxite elongate, nearly twice as long as width at base, slightly



dilated at base of ventro-mesal surface. Outer gonostylus elongate, armed with strong curved spine at tip, crest on outer margin with strong straight spine starting at about two-thirds of gonostylus length. Inner margin dilated at distal end. Inner gonostylus elongate, pale, fleshy and setose, narrowing towards apex. Paramere with two branches, mesal branch widened distally, lateral narrow, spine-shaped in dorsal view. Lateral process of lower shelf slightly dilated, subglobular. Aedeagus straight but comparatively short, far not reaching tip of paramere in dorsal view, apex shallowly bifid. Lateral apodeme long, darkened, plate-shaped. Sperm pump (vesica) oval. Apodeme of vesica short and curved downwards.

ELEVATION. From sea level to 1550 m.

PERIOD OF ACTIVITY. Species has very extended flight period from late January through to middle of October, probably two generations a year.

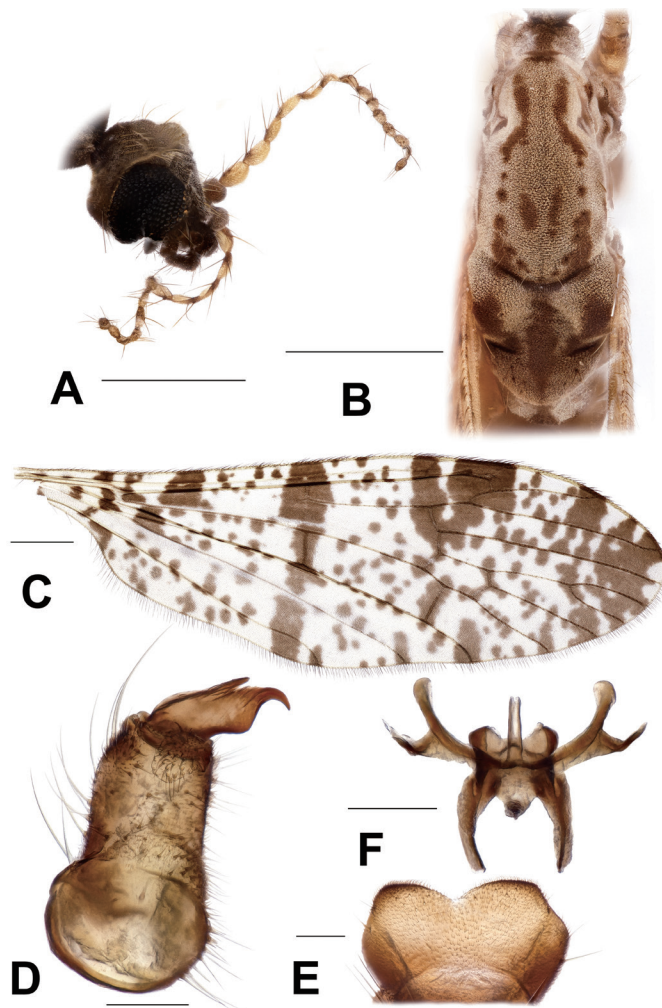
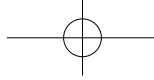


Fig. 28. *Eloephila dietziana* (Alexander, 1925a), male. **A.** Head and antennae; **B.** Dorsum of thorax; **C.** Wing; **D.** Gonocoxite with gonostyles, fronto-dorsal view; **E.** Epandrium, dorsal view; **F.** Aedeagal complex, dorsal view. Scale bars: A–C = 0.5 mm; D–F = 0.1 mm.





HABITAT. Some adults were captured at river margins. They are usually found in places with thermal springs, flying in wet meadows or open sites in forested areas according to Savchenko and Krivolutskaya (1976). Species is attracted to light.

GENERAL DISTRIBUTION. Japan (Honshu, Kyushu, Nansei, Shikoku and Tsushima Islands), Far East of Russia (Kurul Islands), Taiwan.

EXAMINED MATERIAL. Holotype, one male (slide-mounted wing), Japan, Mt. Hakone, altitude 701 m (2300 ft), July 13, 1923, T. Esaki (USNM); one male (pinned), Japan, Kyushu, Mt. Fugandake, altitude 762–1329 m (2500–4361 ft), late May 1922, T. Esaki (ANSP); one male (antenna, fore leg, wing and genitalia slide-mounted), Japan, Kiushiu, Kirishima, altitude 762 m (2500 ft), May 3, 1929, S. Issiki (USNM); one female (pinned), Japan, Tsushima, Uchiyama, May 25, 1930, Esaki & Fujino (ANSP); one male (pinned, genitalia in microvial with glycerol on same pin), Japan, May 27, 1932, Kariya, at light arc (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), Japan, Shikoku, Sugitate, October 12, 1952, Yano (USNM); one male (pinned), Taiwan, Kaohsiung, Ten-chih, altitude 1550 m, 23°04'03"N, 120°45'13"E, August 23, 1996, C.W. Young (CMNH-544, 256).

23. *Eloeophila dravidiana* (Alexander, 1971) (Fig. 29, Pl. 5E)

Limnophila (*Eloeophila*) *dravidiana* Alexander, 1971: 236–237;

Eloeophila dravidiana Oosterbroek, 2023.

DESCRIPTION. General. Body brownish gray. Male body length 6.5 mm, wing length 6.7–6.8 mm, female body length 6.6–7.0 mm, wing length 6.4–8.0 mm. **Head.** Dark brown with yellowish gray spots postero-laterally, narrowly light gray along eye margin. Female antenna reaching to about wing base if bent backwards. Female antenna 1.2–1.3 mm long. Scape elongate, brown, darker at base. Pedicel brown, subglobular, paler distally. 2–3 basal flagellomeres brownish yellow, remainder of flagellum brown, darker at apex. Two basal flagellomeres slightly dilated ventrally, 3–5 flagellomeres oval, remaining segments elongate. Apical segment approximately as long as penultimate, but thicker. Longest verticils 1.3 times as long as respective flagellomeres. Rostrum dark brown. Palpus dark brown to black. **Thorax.** Pronotum light gray with wide dark brown medial stripe. Prescutum and presutural scutum yellowish-grayish brown. Pattern includes medial wedge-shaped stripe, widest frontally and reaching to about middle of sclerite, four short stripes posteriorly, medial stripes reaching each other for a short distance, oblique stripes beyond pseudosutural fovea, few indistinct dots making line between medial and lateral stripes. Scutal lobe light grayish brown frontally, darker brown posteriorly. Area between lobes pale with dark brown spot postero-medially. Pseudosutural fovea distinct, dark brown to black, surrounded by light yellowish gray area. Scutellum dark brown frontally, yellowish posteriorly, with dark brown medial line that makes short stripe together with postero-medial spot between scutal lobes. Mediotergite dark brown, paler laterally. Pleuron dark brown dorsally, yellowish-grayish brown ventrally. Wing whitish frontally, brownish posteriorly, yellowish at base, patterned with abundant dark brown and grayish spots: seven distinct dark brown spots wider than interspaces along frontal margin, brown spots surrounding cross-veins and branching points of veins, diffuse grayish spots in central cells and along posterior



margin. Stigma dark brown. Veins grayish brown, yellowish at wing base and in costal area. Venation typical for the genus, radial sector strongly arcuate at base, *m-cu* slightly before middle of discal cell, cell *m*₁ rather short, just slightly longer than its stem. Anal vein slightly sinuous. It reaches wing margin beyond the level of base of radial sector, but before supernumerary cross-vein in cell *bm*. No macrotrichiae present in distal wing cells. Male wing not widened along posterior margin, widest at tip of vein *CuP*. Stem of halter obscure yellow, knob dark brown with yellowish base. Female halter 1.1 mm long. Coxae brown, fore pair with yellowish marking. Trochanters orange brown. Femur pale yellow at base, light yellowish brown along middle, with wide dark brown ring at tip. Tibia yellow with narrowly orange-brown tip. Basal tarsomeres brownish yellow, distal brown. Female femur I: 4.2 mm long, II: 4.4 mm, III: 4.3–4.6 mm, tibia I: 5.0 mm, II: 4.6 mm, III: 4.5–5.4 mm, tarsus I: 5.0 mm, II: 4.2 mm, III: 3.1–3.8 mm. **Abdomen.** Dark brown, sparsely dusted with brownish gray. Male terminalia with posterior margin of epandrium shallowly concave at middle. Gonocoxite elongate, 1.7 times as long as wide in slide-mounted genitalia of holotype. Outer gonostylus elongate, armed with hook at tip, crest on outer margin hardly visible in dorsal view, but margin serrate distally, inner margin with blunt angle below apical hook. Inner gonostylus elongate, pale, fleshy and setose, narrowing towards blunt apex. Aedeagus straight, extending beyond distal margin of paramere, very tip slightly widened. Basal half of ovipositor orange, distal yellow.

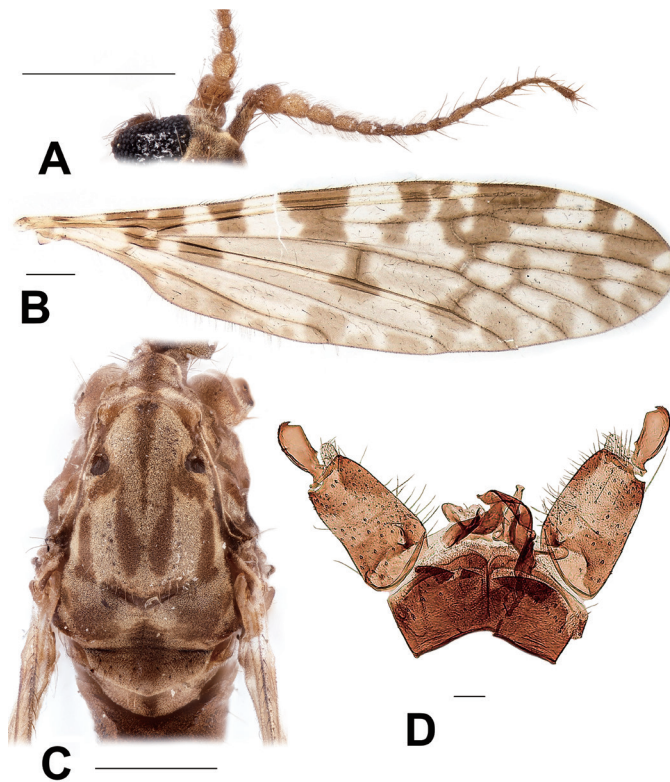
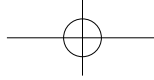


Fig. 29. *Eloeophila dravidiana* (Alexander, 1971). **A.** Female antenna; **B.** Male wing, holotype; **C.** Dorsum of thorax, female; **D.** Male genitalia, holotype, dorsal view. Scale bars: A–C = 0.5 mm; D = 0.1 mm.





ELEVATION. From 2100 m to about 2200 m.

PERIOD OF ACTIVITY. From late December through to end of March.

HABITAT. Unknown.

GENERAL DISTRIBUTION. South India.

EXAMINED MATERIAL. Holotype, male (wing and genitalia slide-mounted), South India, Madras, Avalanche, altitude 2103–2286 m (6900–7500 ft), December 29, 1958, Schmid (USNM); allotype, female (antenna, legs and wing slide-mounted), topotypic (USNM); female (pinned), South India, Kodaikanal, altitude 2134 m (7000 ft), March 26, 1936 (NHMUK 013449279).

24. *Eloeophila dubiosa* (Alexander, 1917) (Fig. 30)

?*Limnophila dubiosa* Alexander, 1917: 156–157;

Limnophila dubiosa Wood, 1952: 220–226;

Limnophila (Elaeophila) dubiosa Alexander, 1964: 359;

Eloeophila dubiosa Oosterbroek, 2023.

DESCRIPTION. General. Male body length 6.5 mm, wing length 5.9–7.5 mm. **Head.** Dark brown. Male antenna elongate, 3.2 mm long. Scape elongate, dark brown. Flagellomeres elongate-cylindrical, bicolored, basal half brownish black, distal dull yellow. Flagellum densely covered with elongate pale pubescence. Apical segment smaller than penultimate in both male and female. Verticils missing. Rostrum black. Palpus black. **Thorax.** Dull dark brown. Pleuron dark brown. Wing yellowish white, heavily patterned with brown. Five large spots at frontal margin, remaining area with numerous spots and dots in all cells. Females with narrower wings (the *minor* group according to Wood, 1952) have completely darkened distal wing area beyond cord. Venation typical for the genus. Original description (Alexander, 1917) says that cell m_1 absent in holotype, but reexamination of holotype and other specimens revealed that cell m_1 is present (Wood, 1952), cell m_1 comparatively short, being equal in length to its stem or just little longer, occasional females possess stem M_{1+2} twice as long as cell m_1 . Radial sector arcuate at base, *m-cu* at about one-fourth of discal cell's length, anal vein slightly sinuous, it reaches wing margin beyond the level of base of radial sector, but before supernumerary cross-vein in cell *bm*. Male wing not widened along posterior margin, widest at tip of vein *CuA*. Stem of halter dull brownish yellow, knob brownish. Coxae dark brown. Trochanters dark brown. Male femur III: 5.2 mm long, tibia III: 5.3 mm, tarsus III: 3.8 mm. **Abdomen.** Dark brown. Posterior margin of epandrium of male terminalia with “V”-shaped indentation at middle. Lateral lobe low but point-apexed. Gonocoxite strongly elongate, 2.7 times as long as width at base. Outer gonostylus elongate, narrow at base, wider at distal end, armed with hook at tip, serrate along distal half of outer margin, inner margin right-angled below apical hook. Inner gonostylus elongate, fleshy and setose, narrowing towards blunt apex. Aedeagus long and straight, extending far beyond tip of paramere, very tip bifid.

ELEVATION. About 450 m.

PERIOD OF ACTIVITY. From September through to late April.

HABITAT. The immature stages occur in gravely sandy spits and in organic saturated mud at the margins of shallow rills and streamlets. Pupation occurs in the drier parts of the spits. The adults



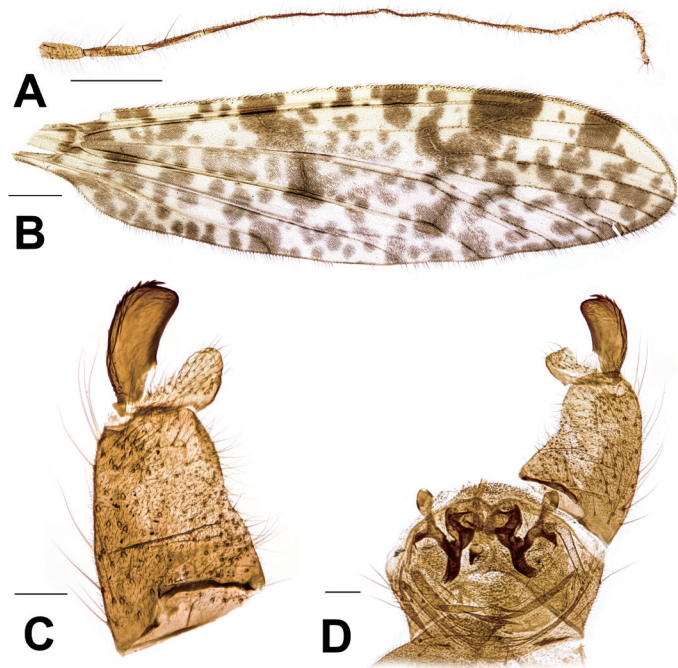


Fig. 30. *Eloephila dubiosa* (Alexander, 1917f), male. **A.** Antenna; **B.** Wing; **C.** Gonocoxite with gonostyles; **D.** Male genitalia, dorsal view (right gonocoxite removed). Scale bars: A, B = 0.5 mm; C, D = 0.1 mm.

occur on the lower sides of boulders and on the undercut banks of streams in shaded woods (Wood, 1952). Adults were collected in dense vegetation near small streams, on rocky walls of shaded ravine and near streams (Alexander, 1964).

GENERAL DISTRIBUTION. South Africa.

EXAMINED MATERIAL. Metatypes, two males (antenna, hind leg, wing and genitalia slide-mounted), South Africa, Cape Peninsula, Table Mt., altitude 457 m (1500 ft), November 4, 1950, Brinck (USNM).

REMARKS. According to Wood (1952), females fall into two different morphological groups that have differences in antennae, wing pattern and venation. Females of *major* group have antenna twice as short as that of male, but wing venation and pattern identical with that of male. Females of *minor* group have antenna that is only about two-thirds length of that of *major* female, wing is narrower with nearly entirely blackened distal half, cell m_1 very small, about twice as short as its stem. Only some *minor* females have cell m_1 as long as in *major* group.

25. *Eloephila dulitensis* (Edwards, 1926) (Fig. 31, Pl. 5F)

Limnophila (*Ephelia*) *dulitensis* Edwards, 1926: 268; 1933: 283;

Eloephila dulitensis Oosterbroek, 2023.



DESCRIPTION. General. Body dark brown, sparsely dusted with gray, thorax ochreous dorsally. Female body length 8.0 mm, wing length 7.0 mm. **Head.** Black. Male antenna nearly reaching wing base if bent backwards. Scape black. Pedicel dark brown, pear-shaped. Four or five basal flagellomeres ochreous, slightly darkened at base, widened ventrally, remainder of flagellum brownish, flagellomeres elongate, nearly cylindrical. Apical segment approximately as long as penultimate. Longest verticils 1.6 times as long as respective flagellomeres. Rostrum dark brown to black, palpus black. **Thorax.** Prescutum and presutural scutum ochreous. Longitudinal stripes reduced to short streaks, interspace between medial and lateral stripes with nine dots making a line, short narrow medial line at frontal margin of sclerite. Scutal lobe light grayish brown with large irregular dark brown spot in the middle. Area between lobes ochreous with dark brown spot postero-medially. Pseudosutural fovea dark brown, surrounded by yellowish area. Scutellum dark brown

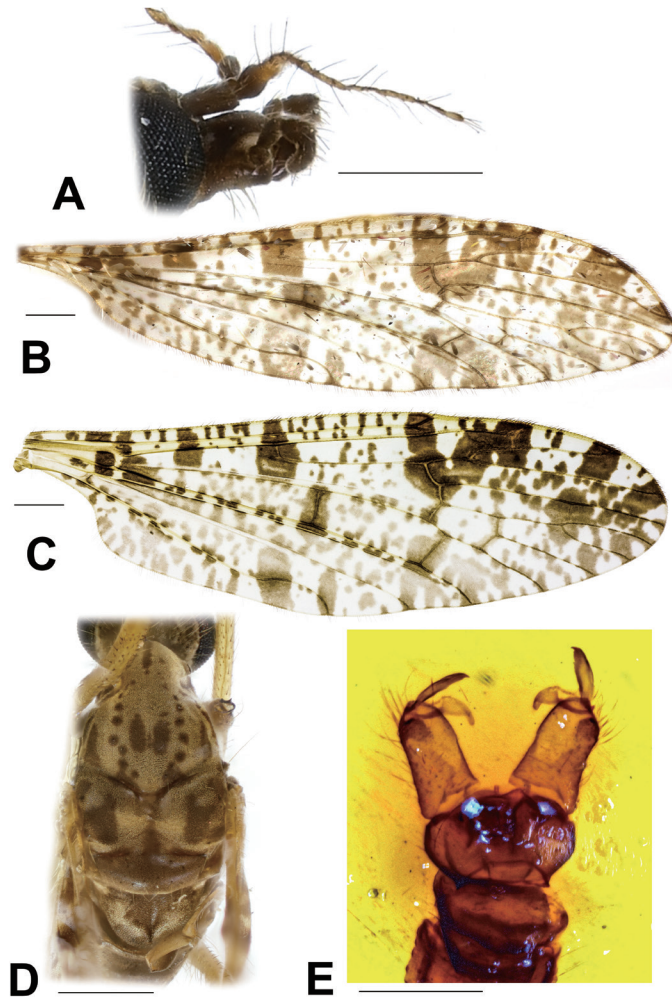
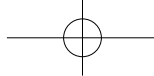


Fig. 31. *Eloeophila dulitensis* (Edwards, 1926). **A.** Male head and antenna; **B.** Male wing; **C.** Female wing, holotype; **D.** Dorsum of thorax, male; **E.** Male genitalia, dorsal view. Scale bars: 0.5 mm.



with grayish margin. Mediotergite widely dark brown medially, lateral and posterior margins widely yellowish gray. Pleuron brownish gray with abundant dark brown spots. Wing whitish with abundant dark brown spots and dots in cells and along veins: seven distinct dark brown spots narrower than interspaces along frontal margin, brown spots surrounding cross-veins and branching points of veins. Stigma dark brown. Veins yellow, but dark brown in the darkened areas. Venation typical for the genus, radial sector angulate and short-spurred at base, *m-cu* slightly before middle of discal cell, cell *m*₁ 1.4 times as long as its stem. Anal vein sinuous. It reaches wing margin beyond the level of base of radial sector and beyond supernumerary cross-vein in cell *bm*. No macrotrichiae present in distal wing cells. Male wing not widened along posterior margin, widest at tip of vein *CuP*. Stem of halter brownish yellow at basal half, pale distally, knob dark brown with pale base. Coxae brown, darker dorsally. Fore and middle trochanters brownish yellow, ventrally darker brown, posterior trochanter dark brown with lighter spot in the middle. Femur yellow with brown subapical ring, tip paler. Tibia yellow with very narrow darkening at tip. Three basal tarsomeres yellow with narrow darkening at distal end, fourth and fifth tarsomeres dark brown. **Abdomen.** Dark brown. Tergites with brown basal part and grayish posterior margin, basal sternites with brownish yellow base, sparsely dusted with gray. Male terminalia brown. Posterior margin of epandrium with “V”-shaped concavity in the middle. Gonocoxite elongate, nearly twice as long as width at base. Outer gonostylus long and narrow, terminating in a spine, inner margin serrate distally, but without prominent angle, crest on outer margin terminating in a spine. Inner gonostylus exceeds outer gonostylus in length, pale and fleshy, narrowing towards blunt apex. Tip of aedeagus extends beyond distal margin of epandrium. Ovipositor ochreous.

ELEVATION. From nearly 700 m to more than 2100 m.

PERIOD OF ACTIVITY. From middle of November through to end of April.

HABITAT. Unknown.

GENERAL DISTRIBUTION. Malaysia (Borneo: Sarawak, Sabah).

EXAMINED MATERIAL. Holotype, female (in ethanol, wing slide-mounted), Borneo, Mt. Dulit, altitude 914 m (3000 ft), January, 1923, 525, E. Mjöberg (NHMUK); male (pinned, genitalia between two plastic pieces on same pin), B.N. Borneo, Kamborangah, Mt. Kinabalu, altitude 2134 m (7000 ft), April 30, 1929, H.M. Pendlebury coll., F.M.S. Museums (NHMUK).

26. *Eloeophila edentata* (Alexander, 1919) (Figs. 32, 93B, C, Pl. 6A)

Limnophila (*Ephelia*) *edentata* Alexander, 1919: 164–165;

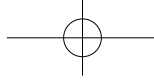
Limnophila (*Elaeophila*) *edentata* Alexander, 1946a: 519;

Limnophila (*Eloeophila*) *edentata* Alexander, 1967: 107, 111;

Eloeophila edentata Oosterbroek, 2023.

DESCRIPTION. General. Male body length 3.8–5.7 mm, wing length 5.3–6.7 mm. Female body length 8.2 mm, wing length 6.7–7.2 mm. **Head.** Male antenna 0.6–1.3 mm long, female 1.1–1.5 mm. Basal flagellomere yellow, remainder of flagellum light brown. Four proximal segments with slightly widened ventral side covered with short pubescence. Basal half of flagellum with flagellomeres oval, distal flagellomeres narrow and elongate. Apical flagellomere elongate,





approximately as long as preceding segment. Longest verticils nearly twice as long as respective flagellomeres. **Thorax.** Pronotum brown with darker brown dorso-median stripe, lateral margins of postpronotum pale. Prescutum and presutural scutum light grayish-yellowish brown with four distinct dark brown longitudinal stripes and widely darkened lateral margin. Medial longitudinal stripes reaching anterior margin of sclerite, but ending far from suture caudally. Stripes separated by light narrow area concolorous with the rest of sclerite anteriorly, but reaching each other posteriorly, thus resembling narrow letter “V”. Some specimens with medial stripes separated for their entire length. Lateral stripe narrow. Intermediate area with few small dots arranged longitudinally, posterior dots making narrow line that reaches suture in some specimens, but extends further, crossing the suture and patterning scutal lobe in other. Area between scutal lobes pale with slightly darker medial line that extends onto scutellum, lobe itself light grayish brown with paler lateral margin. Scutellum with light gray posterior margin, mediotergite light gray with slightly infuscate fronto-lateral angle. Pleuron brownish gray with small dark brown spots. Wing with distinct dark brown spots and dots (Figs 32D, 93B, C). Frontal wing margin with six large spots: between arculus and base of *Rs*, at tips of *Sc*, *R*₁, *R*₂ and *R*₃. Dark area at base of *Rs* extends trough supernumerary cross-vein *m-cu* and reaches posterior wing margin. Spots at tips of *Sc* and *R*₁ confluent posteriorly. Few brown dots in costal area between larger spots, along veins and in anal cell. Venation typical for the genus, radial sector angulate and short-spurred at base, *m-cu* at middle of discal cell, cell *m*₁ approximately as long as its stem. Supernumerary cross-vein in cell *bm* slightly beyond level of *Rs* base and slightly before tip of anal vein. Vein *A*₁ slightly sinuous. Distal wing cells without macrotrichiae. Male wing slightly widened along posterior margin, widest at tip of anal vein. Stem of halter pale yellow, knob distinctly dark brown with pale base. Male halter 0.8–1.0 mm long, female 0.9 mm. Femur yellow with broadly dark brown tip. Tibia brownish yellow with tip narrowly and indistinctly darkened. Basitarsus brownish yellow, remainder of tarsus brown. Male femur I: 3.9–4.7 mm long, II: 4.2–5.0 mm, III: 4.0–5.5 mm, tibia I: 3.4–5.2 mm, II: 4.1–4.5 mm, III: 4.1–5.3 mm, tarsus I: 2.8–4.3 mm, II: 3.3–3.8 mm, III: 2.7–3.7 mm. Female femur I: 5.0 mm long, III: 5.8 mm, tibia I: 5.6 mm, tarsus I: 4.2 mm. **Abdomen.** Dark brown dorsally. Sternites light brownish gray with widely dark brown posterior and lateral margins. Male terminalia dark brown with reddish brown gonocoxites. Posterior margin of epandrium slightly concave at middle. Gonocoxite elongate, narrows towards distal end, 1.6 times as long as width at base. Outer gonostylus blackened, terminating in a large, curved hook, outer margin with a stout spine at base of terminal hook, inner margin with small, blackened tubercle near the base of gonostylus. Inner gonostylus wide, fleshy and setose, blunt-apexed. Paramere “Y”-shaped, with larger club-shaped medial lobe and blackened lateral branch. Lateral projection of lower shelf extends posteriorly into low rounded tip. Aedeagus long and straight, extending beyond distal margin of paramere, slightly bifid at tip. Vesica (seminal pump) slightly wider than longer. Apodeme of vesica bifid in slide-mounted genitalia of holotype, but hidden below vesica in not flattened aedeagal complex of studied specimens.

ELEVATION. From sea level to nearly 3600 m.

PERIOD OF ACTIVITY. From early April through to mid-August.

HABITAT. Near streams.

GENERAL DISTRIBUTION. USA (Arizona, California, New Mexico, Oregon).

EXAMINED MATERIAL. Holotype, male (wing and genitalia slide-mounted), USA, California, Alpine, April 9, 1915, M.C. Van Duzee (USNM); one male (pinned, genitalia in microvial



with glycerol), USA, New Mexico, Jemez Springs, August 16, 1913 (ANSP); one male (antenna, leg, wing and genitalia slide-mounted), USA, Arizona, Oak Creek Canon, altitude 1572 m (5158 ft), June 10, 1942, C.P. Alexander (USNM); four males, one female (pinned, one male genitalia in microvial with glycerol on same pin), USA, Arizona, Oak Creek Canon, altitude 1579 m (5180 ft), June 11, 1942, C.P. Alexander (USNM); nine males, three female, two specimens with unclear sex (pinned), USA, Arizona, Oak Creek Canon, altitude 1579 m (5180 ft), June 12, 1942, C.P. Alexander (USNM); two males, two females (pinned), USA, Arizona, Oak Creek Canon, altitude 1579 m (5180 ft), June 1942, C.P. Alexander (USNM); one female (pinned), USA, California, San Diego Co., Palomar Mountain, altitude 1433 m (4700 ft), July 6, 1945, C.P. Alexander (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, California, San Diego Co., Palomar Mountain, altitude 3566 m (11,700 ft), July 12, 1946, C.P. Alexander (USNM); one

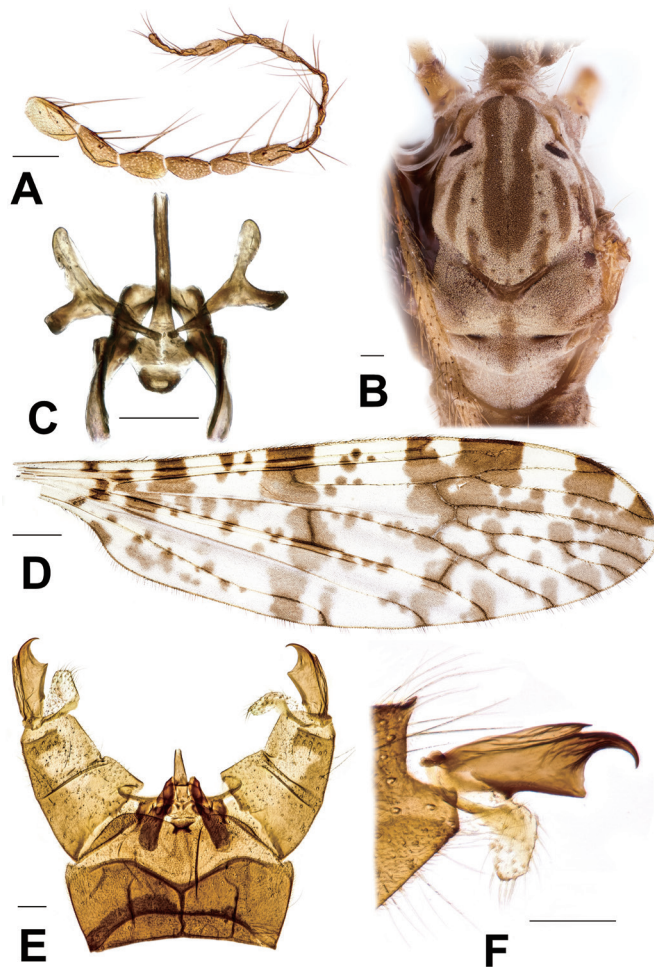
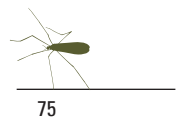
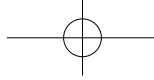


Fig. 32. *Eloeophila edentata* (Alexander, 1919), male. **A.** Antennal flagellum; **B.** Thorax, dorsal view; **C.** Aedeagal complex, dorsal view; **D.** Wing, holotype; **E.** Genitalia, dorsal view, holotype; **F.** Gonostyli, dorsal view. Scale bars: A, B, C, E, F = 0.1 mm; D = 0.5 mm.





male (pinned, genitalia in microvial with glycerol on same pin), USA, Arizona, Sierra Ancha, Parker Creek, May 7, 1947, H. & M. Townes (USNM); two males (pinned), USA, Arizona, Oak Creek Canyon, May 13, 1947, H. & M. Townes (USNM); one specimen of unclear sex (pinned), USA, New Mexico, Santa Fe – for Gallina, altitude 2286 m (7500 ft), June 16, 1947, C.P. Alexander (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, California, Mt. Home Canyon, June 29, 1949, A.L. Melander (USNM); two males, two females (pinned, genitalia of one male in microvial with glycerol on same pin), USA, Oregon, Rogue River N. for Beaver Sulphur Camp, altitude 533 m (1750 ft), August 10, 1950, K.M. Fender (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, California, Upper Santa Ana River, July 25, 1953, A.L. Melander (USNM); one male (antenna, middle and hind legs, wing and genitalia slide-mounted), USA, California, Monterey Co., May 11, 1958 (reared), D. Hynes (USNM); one male (antenna, hind leg, wing and genitalia slide-mounted), USA, California, Monterey Co., Salmon Creek, June 28, 1961, D. Hynes (USNM); one male (wing slide-mounted), USA, California, Inyo Co., Sourdough Canyon, April 19, 1970, La Pre (USNM); one male (head, wing and tip of abdomen slide-mounted), USA, California, Monterey Co., Plaskett Creek camp Ground, Highway 1, June 25, 1975, D.G. Denwing (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, California, Contra Costa Co., Canyon, near, July 17, 1978, D.G. Denning (USNM); one male (pinned), USA, California, Los Angeles Co., San Gabriel Mountains, Placerita Cyn. State Park, Los Pinetos, Cyn., 34.37°N, 118.45°W, altitude 610 m, May 26, 1999, J.N. Hogue, LACM ENT 371938 (CSUN); one male (pinned), USA, California, Santa Barbara Co., Santa Ynez Mountains, Arroyo Hondo, 34.48°N, 120.14°W, altitude 45 m, May 27, 2002, J.N. Hogue, A.V. Evans, M.S. Caterino, JHN #177, LACM ENT 371939 (CSUN).

27. *Eloeophila enischnophallus* Kato, 2021 (Fig. 33, Pl. 6B)

Eloeophila enischnophallus Kato, 2021: 433–435; Oosterbroek, 2023.

DESCRIPTION. Male. General. Body coloration dark brown with ochreous dorsum of thorax. Male body length 3.2–4.7 mm, wing length 4.4–5.8 mm. **Head.** Brownish gray, vertex darker, but without darker longitudinal stripe or spot. Male antenna 1.2–1.3 mm long, reaching to base of wing if bent backwards. Scape elongate, dark brownish gray. Pedicel subglobular, brown. Flagellum obscure yellow, turning grayish towards apex. Five basal flagellomeres dilated ventrally. Remaining flagellomeres elongate. Apical segment small, penultimate 1.4 times as long as apical flagellomere. Longest verticils approximately as long as respective flagellomeres. Rostrum dark brown. Palpus black. **Thorax.** Pronotum with narrow dark brown medial stripe. Prescutum and presutural scutum ochreous, without medial stripes, only two short dark brown confluent streaks at the middle of sclerite, two comma-shaped spots at frontal margin of sclerite above pseudosutural fovea. Lateral stripe narrow but distinct, parallel to darkened margin of sclerite. Interspace between medial streak and lateral stripe with one, two or three dots and short line extending to suture, making “U” shape. Scutal lobe ochreous with dark brown spot at middle and smaller lateral spot. Area between lobes with dark brown line extending through scutellum and mediotergite. Pseudosutural fovea distinct, dark brown. Scutellum brownish gray on both sides of medial stripe. Mediotergite yellowish



gray. Pleuron brownish gray with irregular extensive dark brown spots. Wing whitish, subhyaline, yellowish at base, patterned with intense dark brown spots and abundant dots. Stigma dark brown. Six spots at frontal wing margin, narrower than interspaces. Two broken transverse sutures, at base of radial sector and at cord. Wing cells and longitudinal veins with abundant dots. Veins dark brown, pale or yellowish in the interspaces between dark spots and dots, yellow at wing base and in costal area. Venation typical for the genus, radial sector arcuate at base, *m-cu* at about one-third of discal cell's length, cell m_1 long, 1.4 times as long as its stem. Anal vein weakly sinuous. It reaches wing margin beyond level of *Rs* base and beyond supernumerary cross-vein in cell *bm*. Distal wing cells without macrotrichiae. Male wing slightly widened along posterior margin, widest at about middle length, slightly beyond tip of anal vein. Male halter 0.7 mm long. Stem of halter pale yellow with orange yellow base, knob dark brown or black with pale base. Coxae dark brown with yellowish spots, more intense on fore and middle pairs. Fore and middle trochanters light yellowish brown

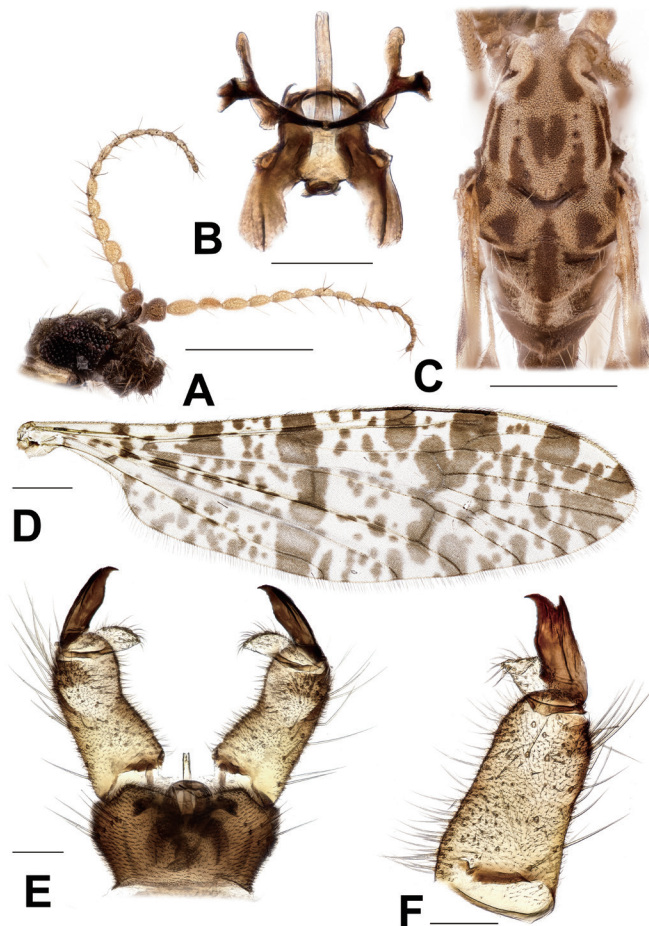
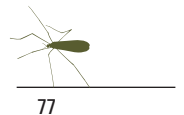
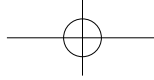


Fig. 33. *Eloeophila enischnophallus* Kato, 2021, male, paratype. **A.** Head with antennae; **B.** Aedeagal complex, dorsal view; **C.** Dorsum of thorax; **D.** Wing; **E.** Genitalia, dorsal view; **F.** Gonocoxite with gonostyli, fronto-dorsal view. Scale bars: A, C, D = 0.5 mm; B, E, F = 0.1 mm.





with darker spots, posterior dark brown with weak yellowish spots. Femur yellow with widely dark brown apex and indistinct narrow yellowish subapical ring. Tibia and three basal tarsomeres yellow with narrowly darkened apices, two distal tarsomeres dark brown. Male femur I: 4.3 mm long, II: 4.4 mm, III: 4.6 mm, tibia I: 4.3 mm, II: 4.0 mm, III: 4.4 mm, tarsus I: 3.4 mm, II: 3.2 mm, III: 3.1 mm. **Abdomen.** Dark brown. Tergites III–V with yellowish spot fronto-medially. Sternites with yellow to brownish yellow spot at frontal half. Two pregenital segments entirely dark brown. Male terminalia reddish brown. Epandrium widely and shallowly concave at middle of posterior margin, covered with dense short setae. Posterior margin laterally produced into low triangle lobule. Gonocoxite elongate, approximately 1.7 times as long as width at base, slightly narrows apically. Outer gonostylus elongate, sclerotized, dark brown. Apex with large, curved spine. Lower margin of stylus slightly swollen at middle. Crest on outer margin tipped with strong spine, but hardly visible in dorsal view, Inner gonostylus oval, pale, fleshy and setose. Paramere with long and narrow medial process, distally widened blackish lateral lobe and small but distinct subbasal lobule. Aedeagus long and straight, extending beyond apex of medial process of paramere. Lateral apodeme long and wide. Lateral process of lower shelf with spine-shaped apex. Apodeme of vesica blackish, short and wide. Sperm pump (vesica) subglobular. *Female.* unknown.

ELEVATION. From sea level to 300 m.

PERIOD OF ACTIVITY. From late January to late May.

HABITAT. Unknown.

GENERAL DISTRIBUTION. Japan (Ryukyu Island).

EXAMINED MATERIAL. Paratype, male (pinned), Japan, Okinawa, Hanejio-kawa River, Taira, Nago-shi, altitude 70 m, May 22, 2016, D. Kato (NRC).

28. *Eloeophila fascipennis* (Brunetti, 1912) (Fig. 34, Pl. 6C)

Ephelia fascipennis Brunetti, 1912: 526–527; Edwards, 1916: 253;

Eloeophila fascipennis Oosterbroek, 2023.

DESCRIPTION. General. Body coloration gray to dark brown. Male body length 4.4–5.1 mm, female 7.3 mm, male wing length 4.9–7.6 mm, female 6.2–7.8 mm. **Head.** Brownish gray, narrowly light gray along eye margin. Vertex with indistinct darker brown medial line and covered with sparse yellow setae. Frons wide, slightly exceeding one-third of the width of the Head. Male antenna 1.1–1.8 mm long, reaching to base of wing if bent backwards. Scape elongate, brown. Pedicel subglobular, brown. Flagellum distinctly bicolored, basal half of each flagellomere dark brown to black, distal half pale yellow. Flagellar segments covered with dense whitish pubescence. Longest verticils approximately as long as respective flagellomeres. Rostrum dark brown. Palpus dark brown to black. **Thorax.** Pronotum brownish gray with narrow dark brown medial line. Prescutum and presutural scutum gray with four indistinct longitudinal stripes. Medial and lateral stripes hardly visible except distinct dark streak at posterior end. That on medial stripe far not reaching suture, more distinct and reaches suture on lateral stripe. Interspace with six scattered dots. Lateral margin of sclerite with distinct streak reaching suture. Scutal lobe dark brown with narrow light gray frontal margin and small gray lateral spot. Area between lobes dark brown. Pseudosutural fovea black.



Scutellum brownish gray with brown medial line and brownish fronto-lateral angle. Mediotergite whitish gray with brown medial line. Pleuron dark brown with irregular light brownish gray spots. Wing whitish, subhyaline, yellowish at base, patterned with intense dark brown spots and abundant dots. Stigma dark brown. Five most distinct spots at frontal wing margin. Broken transverse sutures at base of radial sector and at cord. Wing cells and longitudinal veins with abundant dots. Density of dots varies individually. Veins dark brown, pale or yellowish in the interspaces between dark spots and dots, yellowish at wing base and in costal area. Venation typical for the genus, radial sector arcuate at base, *m-cu* at about one-fourth of discal cell's length, cell *m*₁ long, much longer than its stem, but it varies individually from 1.5 to 2.9 times as long as its stem. Anal vein sinuous. It reaches wing margin beyond level of *Rs* base and beyond supernumerary cross-vein in cell *bm*. Distal wing cells without macrotrichiae. Male wing not widened along posterior margin, widest at about middle length, slightly beyond tip of anal vein. Stem of halter obscure yellow with orange yellow base, knob dark brown with pale base. Male halter 0.7–1.1 mm long, female 0.9–1.2 mm. Coxae yellowish brown, darker dorsally. Trochanters brown. Femur yellow with widely dark brown apical

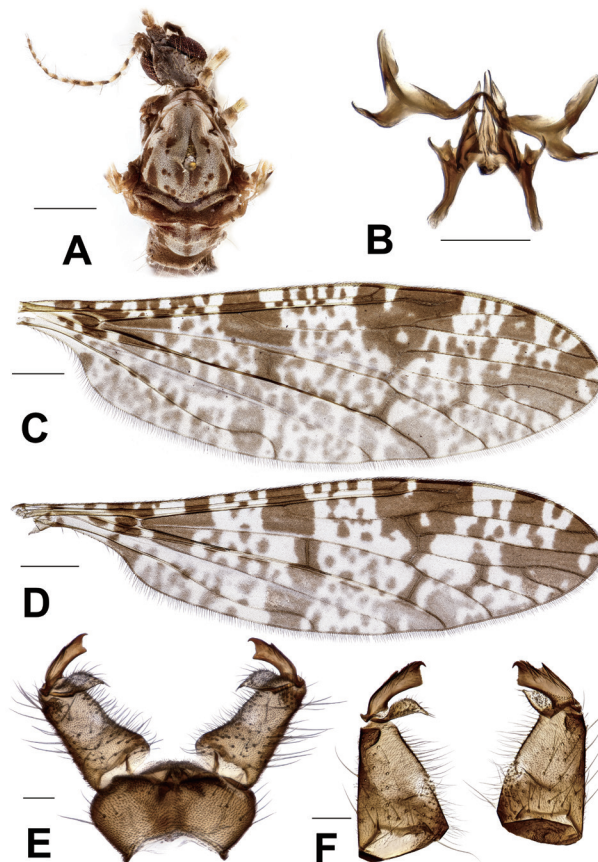
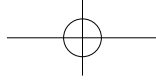


Fig. 34. *Eloeophila fascipennis* (Brunetti, 1912), male. **A.** Thorax and head, dorsal view (India); **B.** Aedeagal complex, dorsal view (Bhutan); **C.** Wing (India); **D.** Wing (variation) (Bhutan); **E.** Genitalia, dorsal view (India); **F.** Gonocoxites with gonostyli, fronto-dorsal view (Bhutan). Scale bars: A, C, D = 0.5 mm; B, E, F = 0.1 mm.view;





part. Tibia and three basal tarsomeres yellow with narrowly darkened apices, two distal tarsomeres brown. Male femur I: 3.5–4.2 mm long, II: 4.0–4.4 mm, III: 4.2–4.8 mm, tibia I: 4.0–4.6 mm, II: 3.6–4.3 mm, III: 3.8–4.7 mm, tarsus I: 3.2–3.9 mm, II: 3.4–3.5 mm, III: 2.3–3.4 mm. Female femur II: 4.4–5.5 mm long, III: 4.7–5.6 mm, tibia I: 5.6 mm, II: 4.0–5.3 mm, III: 4.8–5.9 mm, tarsus I: 5.6 mm, II: 3.6–4.7 mm, III: 3.0–4.2 mm. **Abdomen.** Dark brown to black, tergites yellowish brown at base. Male terminalia dark brown. Posterior margin of epandrium narrowly blackened and covered with abundant small setae, shallowly concave at middle. Gonocoxite elongate, 1.6 times as long as width at base, slightly narrows apically. Outer gonostylus elongate, sclerotized, dark brown. Apex with large, curved spine. Lower margin of stylus extended into angle below spine. Outer margin serrate distally. Crest on outer margin tipped with strong spine which hardly visible in dorsal view. Inner gonostylus setose, narrow at base, strongly widened at middle, distal part narrow, apex blunt. Paramere with two large branches. Aedeagus straight, far not reaching apex of medial branch of paramere. Lateral apodeme long and wide with bifid subbasal projection. Lateral process of lower shelf extends posteriorly along aedeagus. Apodeme of vesica blackish, short and wide. Sperm pump (vesica) elongate.

ELEVATION. From 700 m to nearly 2200 m.

PERIOD OF ACTIVITY. Adults fly from middle of April through August.

HABITAT. Unknown.

GENERAL DISTRIBUTION. India (Himachal Pradesh, West Bengal), Bhutan, Myanmar, Pakistan.

EXAMINED MATERIAL. One male (pinned), Bhutan, altitude 762 m (2500 ft), July–September, 1895, G.C. Dudgeon 95–203 (BMNH); one male (pinned), India, Kasauli, April, 1923, S.R. Christophers, B.M. 1923–107 (BMNH); two females, one specimen of unclear sex (pinned), N.E. Burma [Myanmar], Kambaiti, altitude 2134 m (7000 ft), May 23, 1934, R. Malaise, NHMUK 013435896, NHMUK 013435897, NHMUK 013435898 (BMNH); one male (antenna, wing, leg and genitalia slide-mounted), India, Assam, Cherra Punji, Khasi Hills, altitude 1219 m (4000 ft), August 1935, S. Sircar (USNM); one male (pinned), India, Cherrapunji, altitude 1219–1524 m (4000–5000 ft), 1935, S. Sircar (USNM); one male, one female (pinned, male genitalia in microvial with glycerol on same pin), S. China, Kwangtung [Guangdong], Kan-lin San, Lien-p'ing District, April 16, 1940, J.L. Gressitt & F.K. To (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), China, Ta-chu-lan, July 3, 1948, J. Fu (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), Pakistan, Kawai, altitude 1463 m (4800 ft), June 24, 1953, F. Schmid (USNM).

REMARK. One female from Taiwan, identified by F.W. Edwards as *E. fascipennis* is kept at the BMNH. The record from Taiwan is based on that single female (Edwards, 1916). In my opinion, it is *E. dietziana*, not *E. fascipennis*.

29. *Eloeophila fumigata* (Alexander, 1966) (Fig. 35)

Limnophila (*Eloeophila*) *fumigata* Alexander, 1966: 223–225;

Limnophila (*Elaeophila*) *fumigata* Alexander, 1974: 8;

Eloeophila fumigata Oosterbroek, 2023.



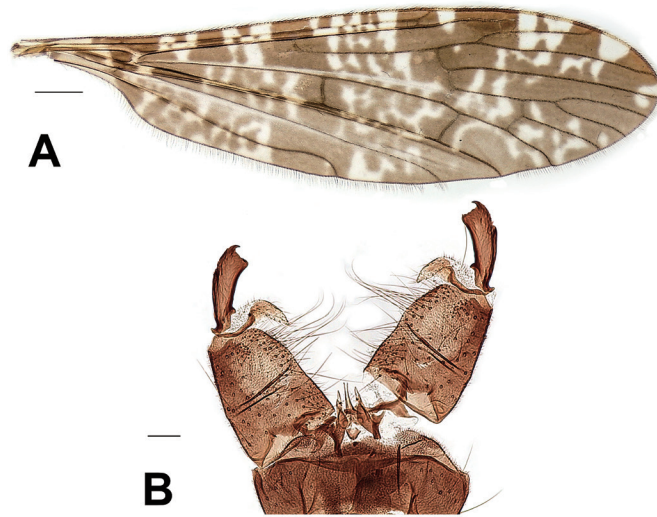
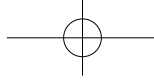


Fig. 35. *Eloeophila fumigata* (Alexander, 1966n), male. **A.** Wing, holotype; **B.** Genitalia, paratype, dorsal view. Scale bars: A = 0.5 mm; B = 0.1 mm.

DESCRIPTION. General. Body coloration dark brown. Male body length 6.5–6.7 mm, wing length 5.7–7.1 mm. **Head.** Yellowish gray, slightly patterned with brown in the middle of vertex, on posterior orbits and on genae. Male antenna 1.8–1.9 mm long, brownish black. Five basal flagellomeres with narrowly yellow distal part. Flagellomeres elongate, two basal segments slightly swollen at ventral side. Apical flagellomere small, slightly more than one-half the penultimate. Longest verticils only about half as long as respective flagellomeres. Rostrum black, covered with gray pruinosity and long black setae. Palpus black. **Thorax.** Pronotum light gray, brown laterally. Prescutum and presutural scutum yellowish gray, patterned with conspicuous dark brown streaks instead of longitudinal stripes. Medial stripe reduced to a dark spot at frontal margin of sclerite and darkening near the suture. Interspace with long stripe. Lateral stripe reduced to short streak. Lateral margin of sclerite broadly dark brown. Postsutural scutum dark brown, sparsely dusted with yellow. Pleuron dark brown with two narrowly interrupted longitudinal gray stripes. Wing dark brown with small translucent spots and dots distributed through all cells, except m_1 . Stigma dark brown. Veins dark brown, yellowish in translucent areas and at wing base. Venation typical for the genus, radial sector arcuate at base, $m-cu$ at about one-fourth of discal cell's length, cell m_1 long, much longer than its stem, but it varies individually from 2.1 to 2.9 times as long as its stem. Anal vein sinuous. It reaches wing margin beyond level of Rs base and beyond or at supernumerary cross-vein in cell bm . Distal wing cells without macrotrichiae. Male wing not widened along posterior margin, widest at about middle length, slightly before tip of vein CuP . Stem of halter pale with narrowly yellow base, knob dark brown. Coxa dark brown, sparsely dusted with yellow. Trochanter brownish yellow. Femur yellow with wide dark brown terminal ring and vaguely paler apical part. Tibia and basal tarsomere yellow with narrowly and indistinctly darkened apices, distal tarsomeres brown. Male femur I: 4.0–5.0 mm long, II: 4.2–5.4 mm, tibia I: 5.1–5.4 mm, II: 4.7–5.7 mm, tarsus I: 4.7–5.1





mm, II: 4.1–4.2 mm. **Abdomen.** Dark brown to brownish black. Male terminalia slightly paler. Posterior margin of epandrium nearly straight. Gonocoxite elongate, 1.4 times as long as width at base in slide-mounted specimens, slightly narrows apically. Outer gonostylus elongate, sclerotized, brown. Apex with large, curved spine, distal margin nearly straight below spine, making right angle with lower margin. Outer margin serrate distally. Crest on outer margin tipped with spine which hardly visible in dorsal view. Lower margin with small tubercle at base. Inner gonostylus fleshy and setose, strongly curved at middle, turning narrower towards apex. Paramere with two large branches, mesal branch long and arched, lateral triangle-shaped. Aedeagus straight, apex reaching beyond tip of medial branch of paramere. Lateral apodeme elongate. Lateral process of lower shelf long and narrow, spine-shaped, extending posteriorly parallel to aedeagus. Apodeme of vesica small and narrow, turned downwards, thus hardly visible in dorsal view. Sperm pump (vesica) elongate.

ELEVATION. Nearly 2300 m.

PERIOD OF ACTIVITY. Middle of July.

HABITAT. Unknown.

GENERAL DISTRIBUTION. India (Assam).

EXAMINED MATERIAL. Holotype, male (antenna, fore and hind legs, wing and genitalia slide-mounted), India, Assam, Manipur, Sirhoi Kashong, altitude 2286 m (7500 ft), July 11, 1960, F. Schmid (USNH); paratype, male (antenna, fore and middle legs, wing and genitalia slide-mounted), topotypic (USNH).

30. *Eloeophila fuscoanalis* (Alexander, 1971) (Fig. 36)

Limnophila (*Eloeophila*) *fuscoanalis* Alexander, 1971: 237–238;

Eloeophila fuscoanalis Oosterbroek, 2023.

DESCRIPTION. General. Body coloration: head and thorax gray, abdomen dark brown. Female body length 9.0 mm, wing length 9.3 mm. **Head.** Yellowish gray, vertex dark brown. Both basal antennomeres brownish black, scarcely pruinose. Proximal flagellomeres obscure yellow, distal flagellomeres bicolored, yellowish at base, darkened at distal end. Rostrum brownish black. Palpus black. **Thorax.** Pronotum yellowish gray, more yellow laterally, with a narrow dark brown medial stripe. Prescutum and presutural scutum yellowish gray, patterned with conspicuous dark brown streaks instead of longitudinal stripes, three dark streaks anteriorly, paler posteriorly. Lateral stripe and lateral margin of sclerite paler brown. Interspace between medial and lateral stripes with five brown dots. Pseudosutural fovea black. Postsutural scutum yellowish gray. Scutal lobe with three brown spots, central spot largest. Pleuron brown with gray spots. Dorsopleural membrane yellowish. Wing pale yellowish with heavy pattern of dark brown spots and dots. Stigma dark brown. Frontal wing margin with large spot surrounding cord and tip of R_1 , large spot at middle of wing covering base of radial sector and supernumerary cross-vein in cell bm . Costal cell with numerous small dots. Such dots abundant along veins and in most cells. Veins yellowish, dark brown in darkened areas. Venation typical for the genus, radial sector angulate and short-spurred at base, $m-cu$ slightly before middle of discal cell's length, cell m_1 long, 3.5 times as long as its stem. Supernumerary cross-vein oblique, at about same level as tip of A_1 . Anal vein sinuous, arched at distal end, just before wing



margin. Distal wing cells without macrotrichiae. Female wing slightly widened at posterior margin, widest close to tip of anal vein. Stem of halter obscure yellow, knob brown. Coxa dark brown, sparsely pruinose. Trochanter brownish yellow. Femur yellow with wide dark brown terminal ring and vaguely paler apical part. Tibia and basal tarsomeres yellow, distal tarsomeres brownish. **Abdomen.** Dark brown. Ovipositor brownish yellow.

ELEVATION. Nearly 2400 m.

PERIOD OF ACTIVITY. Beginning of June.

HABITAT. Unknown.

GENERAL DISTRIBUTION. India (Assam).

EXAMINED MATERIAL. Holotype, female (wing, fore and hind legs slide-mounted), India, Assam, Kameng, Jhum La, altitude 2377 m (7800 ft), June 2, 1961, F. Schmid (USNH).



Fig. 36. *Eloeophila fuscoanalis* (Alexander, 1971), female wing, holotype. Scale bar: 0.5 mm. bars: A = 0.5 mm; B = 0.1 mm.

31. *Eloeophila granulata* (Edwards, 1926) (Fig. 37, Pl. 6D)

Limnophila (*Ephelia*) *granulata* Edwards, 1926: 267–268;

Eloeophila granulata Oosterbroek, 2023.

DESCRIPTION. General. Body coloration grayish brown. Male body length 7.0 mm, female 6.2–8.2 mm, wing length of male 5.8–6.5 mm, female 5.4–6.9 mm long. **Head.** Dark brown, dusted with gray, vertex with scattered dark brown setigerous punctures. Narrowly light gray along eye margin. Male antenna 0.9 mm long, reaching frontal margin of prescutum if bent backwards. Female antenna 1.0–1.2 mm long. Scape dark brown or black, dusted with gray. Pedicel subglobular, light brown. Five or six basal flagellomeres short, approximately as long as wide, pale ochreous, swollen on ventral side. Remaining flagellomeres elongate, shortly cylindrical, longer in male than in female, slightly darker than basal segments. Longest verticils up to three times as long as respective segments. Rostrum dark brown. Palpus black. **Thorax.** Pronotum brownish yellow with a narrow dark brown medial stripe and darkened lateral margins. Prescutum and presutural scutum ochreous with four longitudinal stripes. Medial stripes indistinct, darker brown, ending before suture. Interspace narrower than stripe, wider frontally and with narrow frontal vita. Lateral stripe distinct, dark brown, reaching posterior margin of sclerite. Lateral margin of sclerite distinctly dark



brown. Interspace between medial and lateral stripes with five dark brown dots. Pseudosutural fovea dark brown. Scutal lobe yellowish brown with two dark brown spots closer to lateral margin. Area between lobes paler with dark brown spot in the middle. Scutellum brown with indistinct darker line along middle, posterior margin paler. Mediotergite brownish yellow with dark brown medial stripe, wider frontally. Lateral and posterior margins of mediotergite darkened. Pleuron brownish with an indefinite longitudinal stripe. Dorsopleural membrane paler brown. Wing pale yellowish with characteristic pattern of dark brown spots, sutures and dots. Most distinct spots: two at wing base, transverse band going through base of *Rs* and supernumerary cross-vein in cell *bm*, transverse “Y”-shaped band on cord, darkening along distal margin of discal cell, large spot on vein *M*₁, small spots surrounding tips of all longitudinal veins at wing margin. Numerous small dots evenly distributed through whole wing surface. Largest spots with paler central nuclei and darker margins. Width of

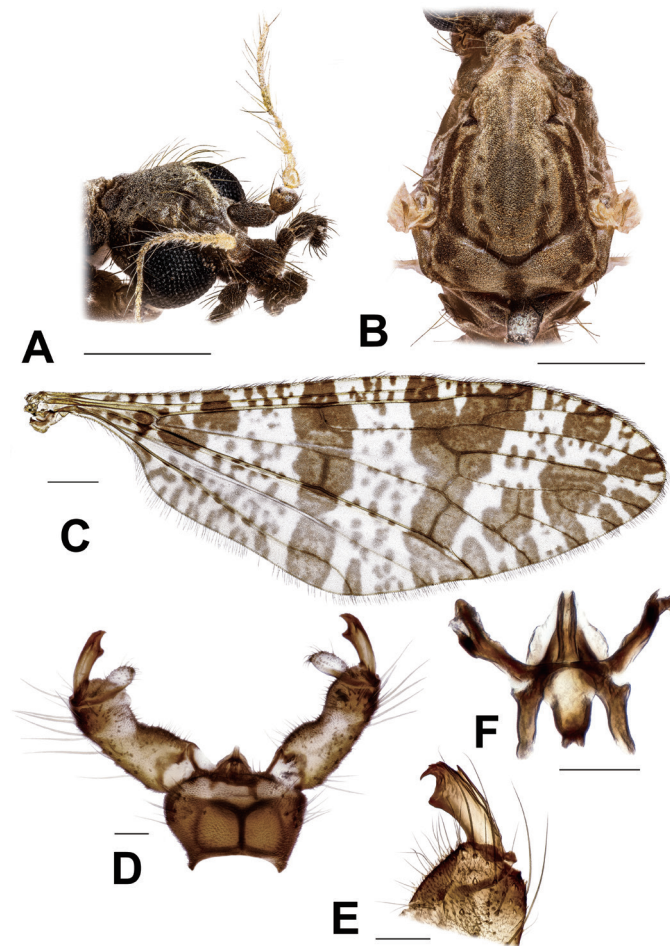


Fig. 37. *Eloeophila granulata* (Edwards, 1926f), male. **A.** Head, dorso-lateral view; **B.** Thorax, dorsal view; **C.** Wing; **D.** Genitalia, dorsal view; **E.** Outer gonostylus, fronto-dorsal view; **F.** Aedeagal complex, dorsal view. Scale bars: A–C = 0.5 mm; D–F = 0.1 mm.

largest spots varies individually, but general pattern is preserved. Stigma dark brown. Veins yellow, especially at wing base and in costal area, dark brown in darkened areas. Venation typical for the genus, radial sector angulate or strongly arched at base, *m-cu* just short distance beyond base of discal cell, cell *m*₁ long, 2.4–2.5 times as long as its stem. Supernumerary cross-vein at about same level as base of *Rs*. Anal vein slightly sinuous, far beyond level of supernumerary cross-vein in cell *bm*. Distal wing cells without macrotrichiae. Male wing strongly widened at posterior margin, widest at tip of anal vein. Distal part of cell *c* also widened, thus frontal wing margin slightly concave at tip of *Sc*. Male halter 0.9–1.1 mm long, female 0.9–1.0 mm. Stem of halter pale yellow, knob dark brown with pale base. Coxa dark brown, sparsely pruinose with yellowish. Trochanter brownish yellow. Femur brownish yellow with brown terminal ring before which the color is lighter. Terminal ring less distinct in some specimens. Tibia and two basal tarsomeres yellow, distal tarsomeres brown to dark brown. Male femur III: 5.2 mm long, tibia III: 5.0 mm, tarsus III: 3.7 mm. Female femur I: 4.9 mm long, III: 4.2–5.6 mm, tibia I: 4.8 mm, III: 4.3–5.2 mm, tarsus I: 4.5 mm, III: 3.4–3.6 mm. **Abdomen.** Dark brown with paler lateral margins of tergites. Male genitalia paler brown. Posterior margin of epandrium slightly concave. Gonocoxite strongly elongate, 2.4 times as long as widest part, slightly constricted at middle. Outer gonostylus sclerotized, elongate, with large, curved spine at apex. Lower margin with large bump distally before apex, outer margin with few small teeth distally at base of spine. Crest on outer margin with small apical spine that is hardly visible in dorsal view. Shape of distal part of gonostylus slightly varies individually. Inner gonostylus widest at middle, pale, fleshy and setose. Paramere long and narrow with small lateral branch. Aedeagus straight with bifid apex, tip approximately at same level as distal end of medial branch of paramere. Lateral apodeme elongate with small subbasal bump. Lateral process of lower shelf wide, membranous, posterior margin rounded. Apodeme of vesica bifid. Sperm pump (vesica) elongate.

ELEVATION. From 600 m to 1500 m.

PERIOD OF ACTIVITY. Adults were collected from mid-June to mid-July.

HABITAT. Unknown.

GENERAL DISTRIBUTION. Malaysia (Peninsular Malaysia, Sarawak).

EXAMINED MATERIAL. Syntype, male (wing and genitalia slide-mounted), Borneo, Mjoberg, B.M. 1924.187 (NHMUK); one male (pinned), Pahang, F.M.S. Cameron's Highlands, altitude 1372–1524 m (4500–5000 ft), June 17, 1935, H.M. Pendlebury (NHMUK); one male (pinned), Pahang, F.M.S. Cameron Highlands, Janah Rala, altitude 1463 m (4800 ft), July 15, 1938, H.M. Pendlebury (NHMUK); one male (pinned), H.M. Pendlebury, coll: F.M.S. Museum, B.M. 1955-354 (NHMUK); male (pinned), Ex F.M.S. Museum, B.M. 1955–354, det F.W. Edwards, 1924 (NHMUK).

32. *Eloeophila hadrophallus* Kato, 2021 (Fig. 38, Pl. 6E)

Eloeophila hadrophallus Kato, 2021: 435–437; Oosterbroek, 2023.

DESCRIPTION. Male. General. Body coloration gray and dark brown. Body length 3.4–3.6 mm (abdomen shrunken), wing length 4.8–5.1 mm. **Head.** Yellowish gray dorsally, dark brown ventrally, dark spot postero-dorso-laterally. Vertex with dark medial stripe. Antenna reaching to about



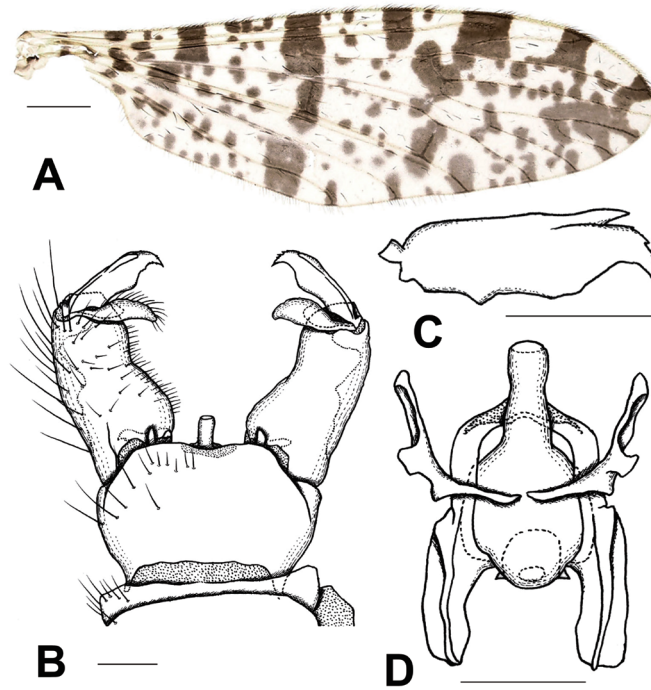


Fig. 38. *Eloeophila hadrophallus* Kato, 2021, male. **A.** Wing; **B.** Genitalia, dorsal view; **C.** Outer gonostylus, ventral view; **D.** Aedeagal complex, dorsal view. Scale bars: A = 0.5 mm; B–D = 0.1 mm (B–D after Kato, 2021. © Magnolia Press. Reproduced with permission from the copyright holder).

base of wing if bent backwards. Scape elongate, dark gray. Pedicel subglobular, brown. Flagellum pale yellow, turning grayish towards apex. Three basal flagellomeres oval, strongly dilated ventrally. Remaining flagellomeres elongate. Rostrum dark brown. Palpus dark brown. **Thorax.** Pronotum with narrow dark brown medial stripe and darkened posterior margin. Prescutum and presutural scutum without longitudinal stripes, but with many small spots instead. Lateral margin of sclerite with large dark spot. Pseudosutural fovea distinct, black. Scutal lobe with three dark spots. Area between scutal lobes with dark spot. Scutellum with dark spot in the middle. Mediotergite with dark medial line, dark brown laterally and posteriorly. Pleuron dark brown variegated with yellowish gray. Wing whitish, subhyaline, yellowish at base, patterned with abundant dark brown spots and dots. Stigma dark brown. Six spots at frontal wing margin narrower than interspaces. Broken transverse suture extending through base of radial sector and supernumerary cross-vein in cell *bm*. Wing cells and longitudinal veins with abundant dots. Veins yellowish, especially at wing base, dark brown in darkened areas. Venation typical for the genus, radial sector angulate and short-spurred at base, *m-cu* slightly before middle of discal cell's length, cell *m*₁ long, 1.4 times as long as its stem. Anal vein weakly sinuous. It reaches wing margin beyond level of *Rs* base and beyond supernumerary cross-vein in cell *bm*, supernumerary cross-vein slightly beyond base of radial sector. Distal wing cells without macrotrichiae. Male wing widened along posterior margin, widest at tip of anal vein. Stem of halter pale yellow with orange yellow base, knob dark brown with pale base. Coxae dark brown,



grayish at base. Fore and middle trochanters yellow, darker distally, posterior trochanter brown. Femur brownish yellow with widely dark brown apex, paler ring before it and indistinct narrow yellowish subapical ring. Tibia and two basal tarsomeres yellow with narrowly darkened apices, third tarsomere brown, two distal segments dark brown. **Abdomen.** Brown to dark brown. Male terminalia yellowish brown. Epandrium widely and shallowly concave at middle of posterior margin. Gonocoxite elongate, approximately 1.7 times as long as width at base, slightly narrows apically. Outer gonostylus elongate, sclerotized, dark brown. Apex with large, curved spine, outer margin of which serrate. Lower margin of stylus slightly swollen at middle. Crest on outer margin tipped with spine, but hardly visible in dorsal view. Inner gonostylus elongate, pale, fleshy and setose. Paramere bifid, both branches nearly equal in length, at right angle to each other. Aedeagus short, slightly curved downwards, apex slightly extending beyond tip of medial arm of paramere. Lateral apodeme long and wide. Lateral process of lower shelf with rounded posterior margin attached to aedeagus in dorsal view, strongly produced ventrally. Apodeme of vesica short and wide, directed antero-ventrally, thus hardly visible in dorsal view. Sperm pump (vesica) elongate, about 1.5 times as long as aedeagus. Female. unknown.

ELEVATION. 250 m.

PERIOD OF ACTIVITY. End of March.

HABITAT. Unknown.

GENERAL DISTRIBUTION. Japan (Amami Island).

EXAMINED MATERIAL. Not available.

33. *Eloeophila igorota* (Alexander, 1931) (Fig. 39, Pl. 6F)

Limnophila (*Ephelia*) *igorota* Alexander, 1931: 24–25;

Eloeophila igorota Oosterbroek, 2023.

DESCRIPTION. General. Male body length 5.0–5.5 mm, female 7.0 mm, wing length of male 5.6–8.2 mm, female 7.5 mm. **Head.** Yellow with blackish spots. Male antenna 1.3 mm long. Both basal antennomeres dark brown, scape dusted with gray. Six to eight basal flagellomeres light yellow. **Thorax.** Prescutum and presutural scutum yellow with four longitudinal stripes and narrow blackish vitta anteriorly. Medial stripe wider and less distinct, grayish yellow with darker dots on frontal part of sclerite anteriorly to pseudosutural fovea, and blackish behind it. Lateral stripe complete, starting from pseudosutural fovea, confluent with the wide dark stripe extending along lateral margin of sclerite. Interspace between medial and lateral stripes with four or five dots, that are partly confluent. Pleuron gray with lots of brown spots arranged longitudinally. Wing pale yellowish with characteristic pattern of dark brown spots and dots. Costal area without larger spots. Three largest dark brown spots: at base of *Rs*, at cord, and surrounding vein *M*₁. Cross-veins narrowly surrounded by darker. Broken suture extends through supernumerary cross-vein in cell *bm*. Whole wing area covered with small dots, more numerous in costal area and in posterior wing cells, scarcer in the middle. Stigma dark brown. Veins yellow, especially in the wing base and in costal area, dark brown in darkened areas. Venation typical for the genus, radial sector arched at base, *m-cu* at middle of discal cell, cell *m*₁ long, 1.9 times as long as its stem. Supernumerary cross-vein at about



middle level between base of *Rs* and tip of anal vein. Anal vein sinuous, reaching far beyond level of supernumerary cross-vein in cell *bm*. Distal wing cells without macrotrichiae. Male wing strongly widened at posterior margin, widest at tip of anal vein. Distal part of cell *c* slightly widened, frontal wing margin slightly concave at tip of *Sc*. Halter with black knob. Male halter 0.9–1.1 mm long. Coxa dark brown. Trochanter yellow with distinctly darkened distal margin. Femur yellow, distal part with light yellowish-brown ring. Only proximal part of ring narrowly blackened. **Abdomen.** Posterior margin of epandrium extended into setose lobe in the middle. Gonocoxite elongate, 1.3 times as long as widest part in slide-mounted specimens. Outer gonostylus sclerotized, elongate, with large, curved spine at apex and small tooth dorsally at base. Outer margin of tooth finely serrate. Lower margin extends into large apical tooth. It also bears small bump at base. Crest on outer margin with small apical spine. Inner gonostylus widest at middle, pale, fleshy and setose. Paramere bifid. Aedeagus straight, apex reaching to about posterior margin of paramere. Lateral apodeme elongate. Lateral process of lower shelf wide, membranous, posterior margin rounded. Apodeme of vesica not visible in dorsal view. Sperm pump (vesica) elongate.

ELEVATION. From less than 500 m to nearly 2500 m.

PERIOD OF ACTIVITY. Possibly two generations a year, one flying from mid-February through to late April, second around middle of September.

HABITAT. Open parklike areas.

GENERAL DISTRIBUTION. Philippines (Luzon, Mindanao).

EXAMINED MATERIAL. Holotype, male (wing, legs and genitalia slide-mounted), Philippines, La Trinidad, Benguet, Luzon, altitude 1463 m, (4800 ft), March 26, 1930, F. Rivera (USNM); allotype, female (wing slide-mounted), topotypic (USNM); paratype, one male (pinned), Luzon, Laguna Province, above Ube, altitude 457 m (1500 ft), February 11, 1930, F. Rivera (USNM); one male (pinned), Pauai, PI, altitude 2438 m (8000 ft), April 21, 1930, F. Rivera (USNM); one male (wing, legs and genitalia slide-mounted), Philippines, Apo, Mindanao, altitude 1981 m (6500 ft), September 14, 1930, C.F. Clagg (USNM).

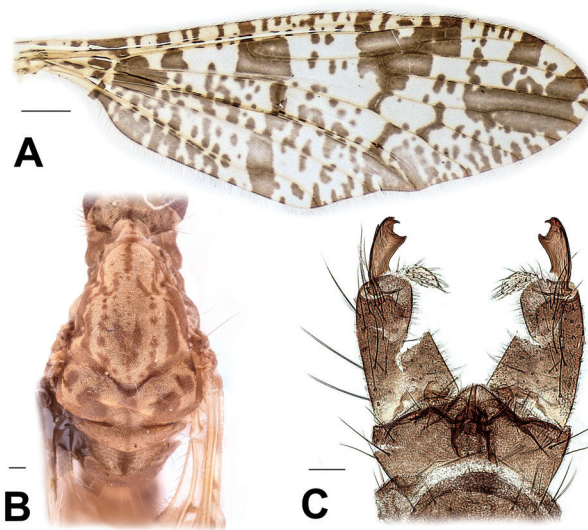


Fig. 39. *Eloeophila igorora* (Alexander, 1931n), male. **A.** Wing; **B.** Thorax, dorsal view; **C.** Genitalia, dorsal view. Scale bars: A = 0.5 mm; B, C = 0.1 mm.

34. *Eloeophila irene* (Alexander, 1927) (Fig. 40, Pl. 7A)

Limnophila (*Ephelia*) *irene* Alexander, 1927a: 58;

Limnophila (*Elaeophila*) *irene* Alexander, 1943b: 385–386; Byers, 2002: 22;

Eloeophila irene Oosterbroek, 2023.

DESCRIPTION. General. Male body length 5.5 mm, female 5.5–6.5 mm, wing length of male 6.0–6.2 mm, female 7.5–8.5 mm. **Head.** Yellowish gray frontally and along eye margin, darker brown dorsally. Antenna reaching to about pseudosutural fovea if bent backwards in male. Scape elongate, dark brown, pedicel subglobular, brown, flagellum brownish yellow, darker distally. Flagellomeres elongate, longest verticils 1.9 times as long as respective segments. Rostrum brown, palpus dark brown. **Thorax.** Pronotum brown, dusted with gray. Prescutum and presutural scutum brownish-grayish yellow with three indistinct longitudinal stripes and narrow darker medial vitta anteriorly. Medial stripe wide, narrower and less distinct posteriorly. Lateral stripe reaching suture. Interspace between medial and lateral stripes with 9–10 small darker setiferous punctures. Scutal lobe uniformly brown, dusted with yellowish, area between lobes pale, indistinctly darker at middle. Scutellum brownish with pale posterior margin. Mediotergite pale yellow with indistinct darker medial line and slightly darkened antero-lateral corner. Pleuron brownish gray with darker brown spot on anepisternum. Wing grayish with distinct pattern of dark brown spots: frontal margin with seven spots, cross-veins, branching points of veins and vein tips along wing margin narrowly surrounded by darker brown. No dark dots along veins or in wing cells. Veins grayish brown, yellowish at base and in costal area. Venation typical for the genus, radial sector angulate and short-spurred at base, *m-cu* at about one-third of discal cell's length, cell *m*₁ medium-long, approximately as long as its stem. Supernumerary cross-vein in cell *bm* distinctly beyond base of *Rs*, nearly at the same level as tip of anal vein. Anal vein slightly arched before wing margin. Distal wing cells without macrotrichiae. Male wing narrow, just slightly widened at posterior margin, widest at tip of anal vein. Halter with yellow stem, orange base and dark brown knob. Coxa yellowish brown. Trochanter light brown. Femur yellow with pale base and indistinctly darkened distal part. Tibia yellow with narrowly brownish tip, three basal tarsomeres yellow, two distal segments brown. **Abdomen.** Bicolourous. Tergites obscure yellow with widely dark brown posterior margins. Sternites pale yellow with darkened posterior margins. Lateral margins of segments narrowly dark brown. Pregenital segment brown. Male genitalia brown. Posterior margin of epandrium blackened and covered with dense short setae, widely concave at middle. Gonocoxite elongate, 1.9 times as long as width at base, slightly swollen at base of mesal surface, bearing tuft of long pale apical setae. Outer gonostylus sclerotized, long and narrow, with small apical spine. Outer margin of gonostylus with prominent bump and fine serration beyond it, lower margin slightly concave. Inner gonostylus widened distally, pale, fleshy and setose, characteristic tufts of erect setae on both sides of stylus subapically. Paramere bifid, medial arm widened, plate-shaped, medial arm twice as short with blackened apical part. Aedeagus slightly curved, apex far not reaching posterior margin of medial arm of paramere. Lateral apodeme elongate, slightly arched before apex, bearing tooth-shaped structure at base. Lateral process of lower shelf wide, dark brown, posterior margin with small extension. Apodeme of vesica dark and rounded in dorsal view. Sperm pump (vesica) slightly wider than longer.



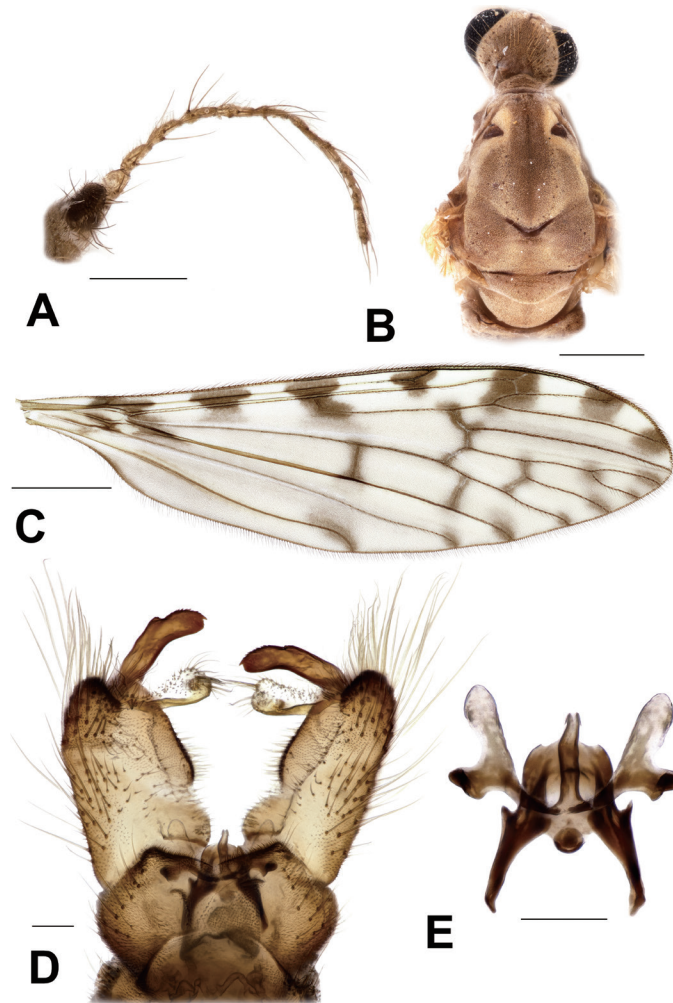


Fig. 40. *Eloeophila irene* (Alexander, 1927b), male. **A.** Antenna; **B.** Head and thorax, dorsal view; **C.** Wing; **D.** Genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A = 0.2 mm; B = 0.5 mm; C = 1.0 mm; D, E = 0.1 mm.

ELEVATION. Unknown. According to Byers (2002), considerable altitudinal distribution.

PERIOD OF ACTIVITY. From middle of June to middle of July.

HABITAT. Streamside vegetation (Byers, 2002).

GENERAL DISTRIBUTION. Canada (New Brunswick, Ontario), USA (Michigan, South Carolina).

EXAMINED MATERIAL. Male (pinned), Canada, Pabos RW, July 3, 1991, reared July 8, 1991, B.V. Peterson (CNC).



35. *Eloeophila johnsoni* (Alexander, 1914) (Fig. 41, Pl. 7B)

Limnophila (*Ephelia*) *johnsoni* Alexander, 1914: 591; 1919b: 810; 1925b: 172; 1926c: 237; 1927b: 57, 64;

Limnophila (*Elaeophila*) *johnsoni* Alexander, 1941a: 304; 1943b: 386; Byers, 2002: 22;

Limnophila (*Eloeophila*) *johnsoni* Young, Gelhaus, 2000: 18, 24, 34, 56, 110, 127, 150, 201;

Eloeophila johnsoni Petersen, 2003: 93; Petersen et al., 2005: 7; Gathmann, Williams, 2006: 148; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration yellow. Male body length 4.0–5.0 mm, female 6.5–7.5 mm, wing length of male 5.2–7.2 mm, female 7.0–8.6 mm. **Head.** Yellow, dusted with pale. Antenna very pale yellowish brown. Male antenna 1.2 mm long. Rostrum pale brownish yellow, palpus very pale yellowish brown. **Thorax.** Pronotum pale yellow. Prescutum and presutural scutum pale yellow with four broad indistinct darker longitudinal stripes. Scutum light yellow with a sparse pale gray pruinosity. Scutellum light yellow with a sparse pale gray pruinosity. Mediotergite light yellow with a sparse pale gray pruinosity. Pleuron yellowish. Wing translucent, pale yellow without dark spots. Veins pale. Venation typical for the genus, radial sector angulate at base (Alexander, 1914), but illustrations show arcuate base of *Rs* (Alexander, 1914, Fig. 2; 1919b, Fig. 138), *m-cu* at about middle of discal cell, cell *m*₁ medium-long, 2.4 times as long as its stem. Supernumerary cross-vein in cell *bm* slightly beyond base of *Rs*, nearly at the same level as tip of anal vein. Anal vein slightly sinuous. Male wing narrow, just slightly widened at posterior margin, widest at tip of anal vein. Halter pale yellow. Male halter 0.5 mm long. Femur yellow. Tibia brownish yellow. Tarsus brownish yellow. Femur I: 4.0 mm long, tibia I: 3.9 mm, tarsus I: 3.7 mm. **Abdomen.** Very light brownish yellow. Outer gonostylus of male genitalia elongate with strong curved spine at apex. Outer margin serrate with strong straight spine starting at about one-third of gonostylus length and reaching beyond middle, inner margin slightly swollen near base.

ELEVATION. From nearly 500 m to more than 1200 m.

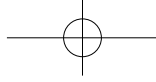
PERIOD OF ACTIVITY. From late May through to early July.

HABITAT. In recorded case, a small stream that arises in cold springs. The stream forms a series of small cascades and rapids over densely moss-covered rocks, moderately shaded by hemlock, yellow and white birch, butternut and willow. At this season of the year (June 30) the herbage was chiefly of interrupted and sensitive ferns, seedling *Impatiens* and scattered remnants of the spring flora, including *Tiarella*, *Smilacina* and others. The crane flies were mostly swept from this rank herbage (Alexander, 1925b) in the zone of northern hemlock (Alexander, 1941a); fully aquatic in the larval stage (Young, Gelhaus, 2000).

GENERAL DISTRIBUTION. Canada (New Brunswick, Ontario, Quebec), USA (New Hampshire, New York, North Carolina, South Carolina, Tennessee).

EXAMINED MATERIAL. Allotype (misabeled as holotype), female (wing slide-mounted), USA, New Hampshire, Bretton Woods, June 23, 1913, C.W. Johnson (USNM); one male (pinned), USA, New York, Ithaca, Coy Glen, May 23, 1915 (USNM); metatype, male (wing slide-mounted), USA, New York, Fulton Co., Sacandaga Park, June 15, 1916, C.P. Alexander (USNM); metatype, male (wing and genitalia slide-mounted), Canada, Ontario, Orillia, June 5, 1925, C.H. Curran (USNM); one male (pinned), Canada, New Brunswick, Lepreau Harbour, July 1, 1929, D. Galbraite





(USNM); two males (pinned), Canada, New Brunswick, Lepreau Harbour, July 6, 1929, D. Galbraite (USNM); three males, three females (pinned), USA, North Carolina, altitude 1219 m (4000 ft), June 2, 1940, C.P. Alexander (USNM); two males (pinned), USA, North Carolina, Linville Falls, altitude 975 m (3200 ft), June 3, 1940, C.P. Alexander (USNM).

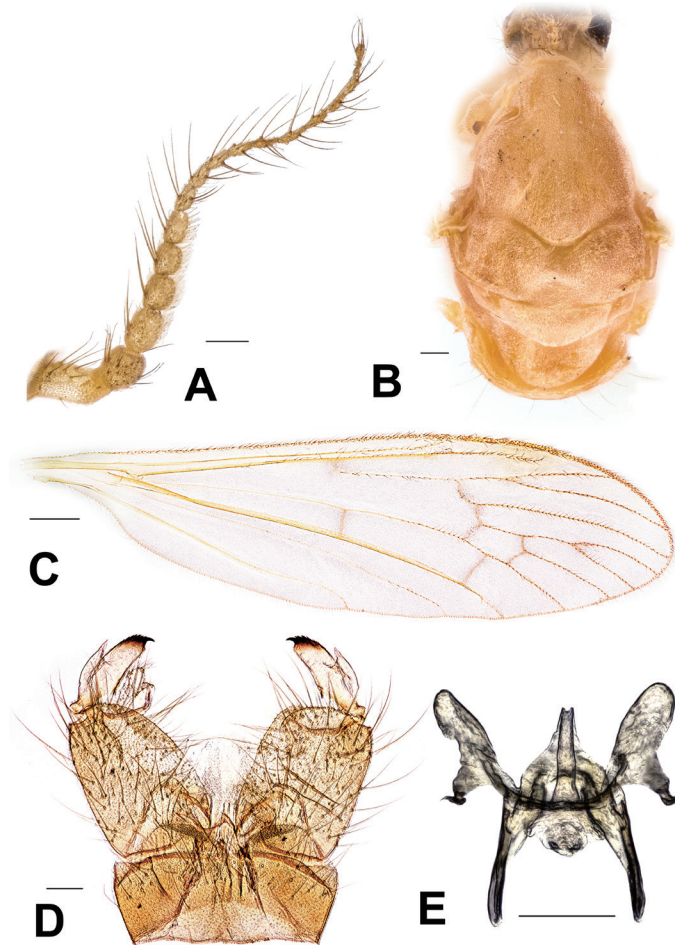


Fig. 41. *Eloeophila johnsoni* (Alexander, 1914k), male. **A.** Antenna; **B.** Thorax, dorsal view; **C.** Wing; **D.** Genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A, B, D, E = 0.1 mm; C = 0.5 mm.

36. *Eloeophila kintaro* (Alexander, 1957) (Fig. 42, Pl. 7C)

Limnophila (*Elaeophila*) *kintaro* Alexander, 1957: 362–363;

Limnophila (*Eloeophila*) *mishimai* Alexander, 1969: 39–40;

Eloeophila (*Eloeophila*) *kintaro* Savchenko, Krivolutskaya, 1976: 59–61;

Eloeophila kintaro Kato, 2021: 437–439; Oosterbroek, 2023.



DESCRIPTION. General. Body coloration brown. Male body length 4.7–7.0 mm, female 7.0–8.2 mm, male wing length 5.4–7.8 mm, female 7.0–8.8 mm. **Head.** Brown, dusted with gray, darker posteriorly, ochreous along eye margin. Antenna brownish yellow. Male antenna 1.5–1.9 mm long, reaching base of wing if bent backwards. Scape slightly elongate, dark brown. Pedicel short, widened distally, yellowish brown. Basal half of flagellum testaceous yellow, outer segments infusate. Five basal flagellomeres slightly dilated ventrally, short oval. Remaining flagellomeres elongate. Apical segment slightly enlarged, 1.3 times as long as penultimate. Longest verticils 1.6 times as long as respective flagellomeres. Flagellar segments covered with dense short erect pubescence. Rostrum dark brown. Palpus blackish. **Thorax.** Pronotum brownish gray, yellowish postero-laterally. Prescutum and presutural scutum yellowish brown to ochreous or chestnut brown, without longitudinal stripes, with narrow darker brown median vitta and darkened lateral margin. Scutal lobe brownish, dusted with gray. Area between lobes yellowish. Pseudosutural fovea distinct, black. Scutellum brownish, dusted with gray, yellowish fronto-medially, posterior margin with few long whitish setae. Mediotergite uniformly yellowish brown, sparsely covered with gray pruinosity. Pleuron reddish brown with darker brown anepisternum. Wing grayish, subhyaline, yellowish at base, patterned with sparse brown spots. Stigma brown. Five small spots at frontal wing margin, at humeral vein, tips of Sc , R_1 , R_3 and R_4 , largest of them at stigmal region. Grayish brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins. Indistinct darkening surround vein tips at posterior wing margin. Veins brown, yellow at wing base and costal area. Venation typical for the genus, radial sector angulate and short-spurred at base, $m-cu$ slightly beyond middle of discal cell, cell m_1 long, 1.4 times as long as its stem. Anal vein weakly sinuous. It reaches wing margin distinctly beyond level of supernumerary cross-vein in cell bm . Distal wing cells with macrotrichiae. Male wing not widened at posterior margin, widest at about middle length, slightly beyond tip of anal vein. Halter 1.1 mm long in male, pale with orange yellow base of stem and tip of knob. Coxa yellow with brown base. Trochanter yellow with darker distal margin. Femur yellow, very tip narrowly brownish. Tibia and two basal tarsomeres pale yellow with narrowly darkened apices, two distal tarsomeres brownish. Claw dark brown. Male femur I: 5.2 mm long, II: 5.3 mm, III: 5.9 mm, tibia I: 5.5 mm, II: 5.1 mm, III: 5.5 mm, tarsus I: 5.3 mm, II: 4.3 mm, III: 3.8 mm. **Abdomen.** Three basal tergites dark brown, tergites fourth to eighth yellowish with darkened posterior and lateral margins, ninth segment rusty brown. Three basal sternites dark brown, remaining sternites with wide brown to dark brown posterior and lateral margins, yellowish anteriorly. Male terminalia yellowish brown. Epandrium with two low blackened lobes and shallow wide concavity between them at middle of posterior margin. Gonocoxite elongate, twice as long as widest part, slightly narrows apically. Vento-mesal surface slightly swollen at base. Outer gonostylus elongate, sclerotized, brown to dark brown. Apex with large, curved spine. Lower margin of stylus extended apically into blunt lobule, outer margin with large spine. Inner gonostylus pale, fleshy and setose, widest at middle. Paramere with long mesal lobe that slightly widens distally, lateral lobe short in dorsal view. Aedeagus long, almost straight, extending to about apex of mesal process of paramere. Lateral process of lower shelf wide, distal part membranous, extending along aedeagus. Apodeme of vesica directed ventrally and not visible in dorsal view. Sperm pump (vesica) oval.

ELEVATION. From 300 m to nearly 1400 m.

PERIOD OF ACTIVITY. From late April through to mid-August.



HABITAT. In recorded case, a small pool close to a thermal spring surrounded by broad leaved forest (Savchenko, Krivolutskaya, 1976).

GENERAL DISTRIBUTION. Japan (Honshu Island), Russia (Kuril Islands).

EXAMINED MATERIAL. Holotype, male (antenna, fore leg, wing and genitalia slide-mounted), Japan, Honshu, Kurokawa, Echigo, May 28, 1954, K. Baba (USNM); paratype, male (antenna, wing, leg and genitalia slide-mounted), topotypic (USNM); male (as holotype of *Limnophila (Elaeophila) mishimai*) (antenna, wing, hind leg and genitalia slide-mounted), Japan, Honshu, Hida, Ontake, July 14, 1958, Toshio Mishima (USNM); male (wings, legs and genitalia slide-mounted), topotypic with holotype of *Limnophila (Elaeophila) mishimai* (USNM); male (pinned), Japan, Kagoshima, Yakushima-cho, unnamed stream near Mt. Maedake, altitude 625 m, April 26, 2018, D. Kato (NRC).

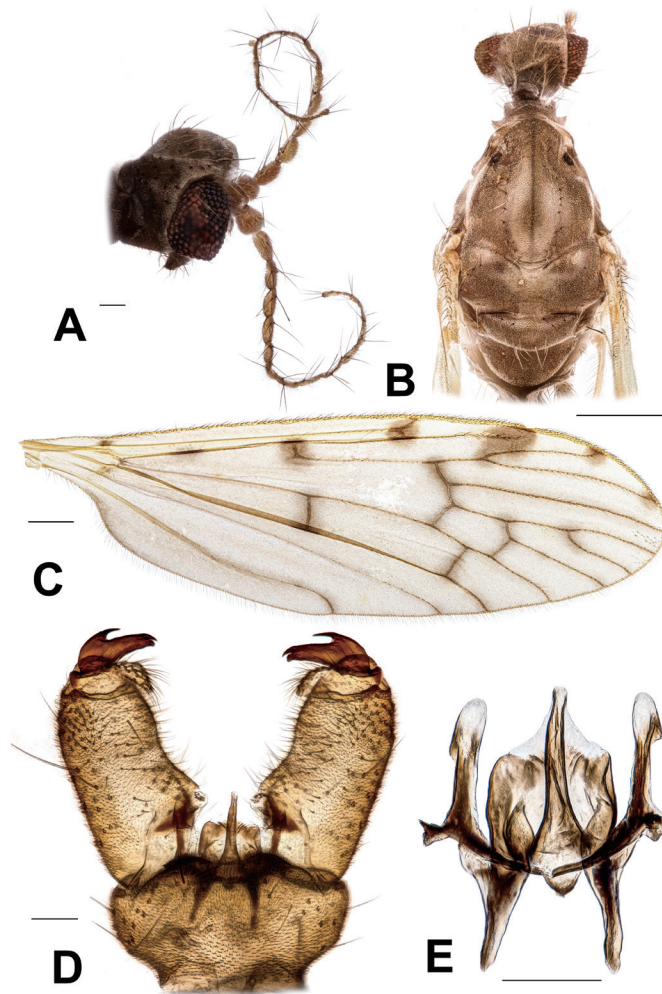
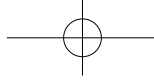


Fig. 42. *Eloephila kintaro* Alexander, 1957d, male. **A.** Head with antennae, lateral view; **B.** Head and thorax, dorsal view; **C.** Wing, holotype; **D.** Genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A, D, E = 0.1 mm; B, C = 0.5 mm.



37. *Eloeophila laciniata* (Edwards, 1928) (Fig. 43, Pl. 7D)

Idioptera (*Ephelia*) *laciniata* Edwards, 1928: 185;

Eloeophila laciniata Starý, 2004; 2009a: 429–430; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration grayish brown to dark brown. Male wing length 7.9 mm. **Head.** Brownish gray frontally, dark brown posteriorly and laterally, narrowly light gray along eye margin. Male antenna 1.2 mm long, reaching frontal margin of prescutum if bent backwards. Scape elongate, nearly cylindrical, dark brown, dusted with gray pruinosity. Pedicel short, subglobular, dark brown. Flagellum obscure yellow, slightly darkened towards distal end. Basal flagellomeres short, oval, distal flagellomeres elongate. Apical segment as long or slightly longer as penultimate. Longest verticils twice as long as respective flagellomeres. Flagellar segments covered with dense short erect pubescence on ventral side. Rostrum dark brown, covered with gray pruinosity. Palpus dark brown to black. **Thorax.** Pronotum brown. Prescutum and presutural scutum with four longitudinal stripes and dark spot at lateral margin. Scutal lobe with dark spot. Area between lobes with dark spot that extends onto scutellum posteriorly. Scutellum light gray with dark brown spot fronto-medially. Mediotergite light gray. Pleuron light brownish gray with darker brown katepisternum. Wing brownish, subhyaline, yellowish at base, patterned with brownish spots. Stigma darker brown. Seven spots at frontal wing margin, interspaces slightly wider than spots. Less distinct grayish spots surround cross-veins, branching points and tips of all veins along wing margin. Veins brownish yellow, brighter yellow in costal area, brownish in darkened areas. Venation typical for the genus, radial sector angulate at base, *m-cu* slightly beyond middle of discal cell, cell *m*₁ long, 1.7 times as long as its stem. Anal vein slightly arched and short-spurred at distal end. It reaches wing margin beyond level of supernumerary cross-vein in cell *bm*. Distal wing cells with macrotrichiae. Male wing moderately broad, not widened, posterior margin evenly curved. Male halter 1.2 mm long, pale with brownish yellow stem and dark brown knob. Coxa brown. Trochanter brown with yellowish spot at middle. Femur obscure yellow, tip brown. Tibia and three basal tarsomeres obscure yellow with narrowly darkened apices, two distal tarsomeres brown. Claw dark brown. Male femur I: 5.0 mm long, II: 5.6 mm, III: 5.7 mm, tibia I: 6.1 mm, II: 5.7 mm, III: 6.6 mm, tarsus II: 5.2 mm, III: 4.8 mm. **Abdomen.** Tergites dark brown with posterior margins narrowly grayish, covered with sparse whitish setae. Posterior margin of epandrium of male terminalia smoothly rounded without emargination. Gonocoxite slightly elongate, widened at base, 1.6 times as long as widest part at base, narrows apically and bears a conspicuous flap-like expansion ventro-distally. Ventro-mesal margin extended into lobule that is finely serrate distally. Outer gonostylus elongate, sclerotized, dark brown to blackish, with large terminal spine and subacute tooth on inner margin proximal to a wide subapical emargination, outer margin with indistinct crest, finely serrate distally. Inner gonostylus pale, fleshy and setose, slightly curved, widest at middle. Paramere with long blade-shaped setoseless mesal lobe and small narrow darkened lateral lobe. Aedeagus moderately long, straight and narrow, extending beyond distal tip of paramere. Distal part of lateral projection of lower shelf rounded, slightly exceeding posterior edge of median projection. Apodeme of vesica large, subglobular. Sperm pump (vesica) large, subglobular.

ELEVATION. From 550 m to nearly 700 m.

PERIOD OF ACTIVITY. From late April to mid-June.



HABITAT. In recorded case, marsh at river mouth (Edwards, 1928).

GENERAL DISTRIBUTION. France (Corsica), Italy (Sardinia).

EXAMINED MATERIAL. Holotype, male (pinned, genitalia on a celluloid slide pinned with the specimen), France, Corsica, Calvi, N. coast, April 10–25, 1928, F.W. Edwards (BMNH(E) #247380).

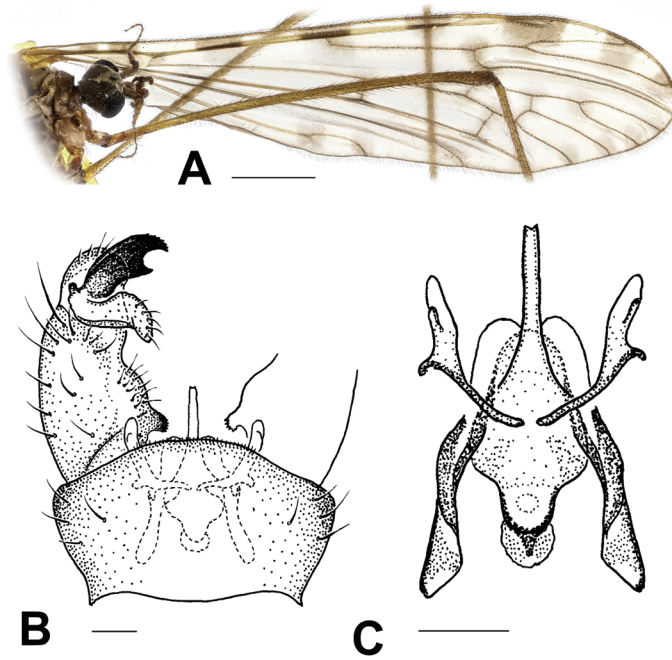


Fig. 43. *Eloeophila laciniata* (Edwards, 1928), male. **A.** Wing, holotype; **B.** Genitalia, dorsal view; **C.** Aedeagal complex, dorsal view. Scale bars: A = 1.0 mm; B, C = 0.1 mm (B, C after Stary, 2009a).

38. *Eloeophila latinigra* (Alexander, 1941) (Fig. 44)

Limnophila (*Elaeophila*) *latinigra* Alexander, 1941b: 53–54;

Eloeophila latinigra Oosterbroek, 2023.

DESCRIPTION. General. Body coloration gray. Male body length about 5.5 mm, wing length 6.0–6.1 mm. **Head.** Gray, vertex with dark brown spot at middle. Both basal antennomeres black, sparsely pruinose, pedicel subglobular. Flagellomeres bicolored, black at base, yellow distally. Black area increases towards apex of flagellum, distal flagellomeres completely black. Basal flagellomeres elongate, length decreases towards apex of flagellum. Longest verticils nearly as long as respective segments. Rostrum black, sparsely pruinose. Palpus black. **Thorax.** Gray dorsally. Pronotum with brown spot at middle. Prescutum and presutural scutum with six brown spots instead of longitudinal



stripes. Scutal lobe gray with two dark brown spots. Tubercular pits and pseudosutural fovea black. Scutellum dark gray. Mediotergite gray with darker medial line. Pleuron gray with distinct dark brown spots making two irregular partly broken longitudinal stripes. Wing brownish, subhyaline, yellowish at base and in costal area, patterned with large dark brown spots and numerous dots in all cells. Spots at frontal wing margin distinctly narrower than interspaces. Transverse suture extends through base of *Rs* and supernumerary cross-vein in cell *bm*, broken “Y”-shaped suture at cord, large spot at wing tip. Stigma dark brown. Dark areas surround cord, distal margin of discal cell, cross-veins and branching points of veins. Veins grayish brown, yellowish at wing base and costal area, darker brown in darkened areas. Venation typical for the genus, radial sector arcuate at base, *m-cu* at about one-third of discal cell’s length, cell *m*₁ very long, 3.2 times as long as its stem. Anal vein slightly sinuous, without subapical spur. It reaches wing margin slightly beyond level of supernumerary cross-vein in cell *bm*. Distal wing cells without macrotrichiae. Male wing widened at posterior margin, widest in the middle between tips of anal vein and *CuP*. Stem of halter brown with yellow base, knob with dark brown apex and whitish base. Coxa dark brown, covered with gray pruinosity. Trochanter black. Femur yellow with wide black ring at apex. Width of ring approximately one-fifths of femur length. Tibia yellow with narrowly blackened tip. Basal tarsomere obscure yellow with darkened apex, distal tarsomeres brown. Male femur III: 4.4 mm long, tibia III: 5.3 mm, tarsus III: 3.7 mm. **Abdomen.** Brownish black, sparsely covered with gray pruinosity. Male terminalia brown. Posterior margin of epandrium with wide and shallow “V”-shaped emargination

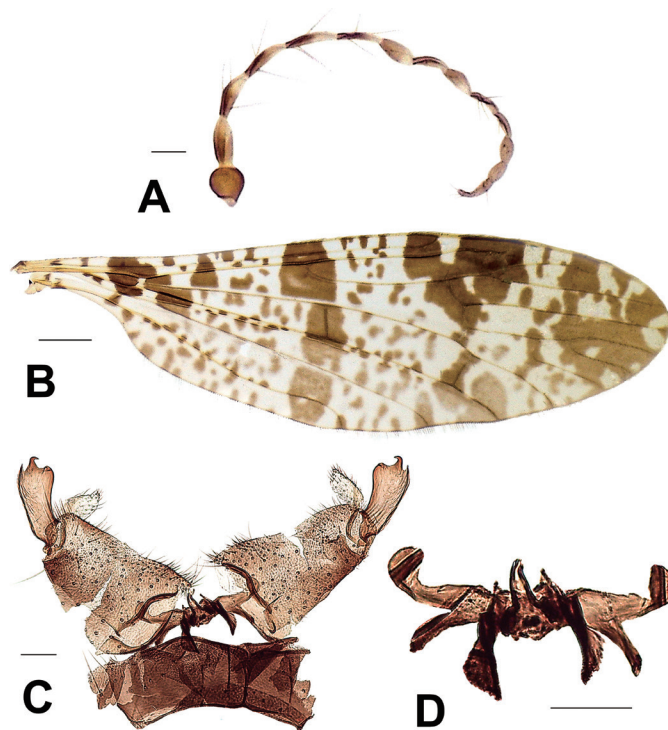
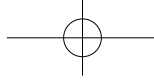


Fig. 44. *Eloephila latinigra* (Alexander, 1941o), male, holotype. **A.** Antenna; **B.** Wing; **C.** Genitalia, dorsal view; **D.** Aedeagal complex. Scale bars: A, C, D = 0.1 mm; B = 0.5 mm.





at middle and low wide lateral lobe. Gonocoxite elongate, 1.5 times as long as widest part in slide-mounted specimen, narrows apically. Outer gonostylus elongate, sclerotized, brown, narrower at base, wider at distal end. Distal margin with large hook at middle, spine at outer margin, rounded bump at inner margin. Inner gonostylus pale, fleshy and setose, narrows toward apex. Paramere with curved mesal lobe, lateral lobe narrow, comparatively long. Aedeagus slightly arched, extending to about apex of mesal process of paramere. Lateral projection of lower shelf spine-shaped. Lateral apodeme moon-shaped in dorsal view. Apodeme of vesica directed ventrally and visible only as darkened area in dorsal view. Sperm pump (vesica) oval.

ELEVATION. About 500 m.

PERIOD OF ACTIVITY. Beginning or middle of April.

HABITAT. Unknown.

GENERAL DISTRIBUTION. China (Fujian Province).

EXAMINED MATERIAL. Holotype, male (antenna, wing, hind leg and genitalia slide-mounted), E. China, Fukien, Kuliang, altitude 457–762 m (1500–2500 ft), April 6–13, 1938, C.R. Kellogg (USNM).

39. *Eloeophila lilliputina* (Alexander, 1936) (Fig. 45, Pl. 7E)

Limnophila (*Elaeophila*) *lilliputina* Alexander, 1936a: 246–247;

Eloeophila lilliputina Nakamura, 2014: 12; Kato, 2021: 440; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration dark brown and gray pruinose with distinct grayish areas on thorax and yellowish spots on Abdomen. Male body length 3.5–4.3 mm, wing length 3.8–5.5 mm. **Head.** Brownish to ochreous gray, occiput dark brown posteriorly, covered with sparse brownish setae. Male antenna nearly reaching base of wing if bent backwards. Scape elongate, nearly cylindrical, dark brown, sparsely covered with gray pruinosity. Pedicel brown, subglobular, bearing few strong setae. Flagellum yellow, the outer segments a trifle darker. Flagellomeres oval, at least two basal flagellomeres dilated ventrally. Rostrum brown to dark brown. Palpus dark brown. **Thorax.** Pronotum light brownish gray with dark brown median line. Prescutum and presutural scutum ochreous gray with four distinct dark brown longitudinal stripes. Medial stripes narrow, starting at frontal margin of sclerite but far not reaching suture, closer to each other posteriorly, with very short lateral branch at middle behind pseudosutural fovea, not reaching lateral stripe. Lateral margin of sclerite darkened. Lateral stripe short. Intermedial area with few small dark dots. Posterior margin of sclerite with two larger spots reaching suture. Scutal lobe brownish gray with two small dark brown spots. Area between lobes concolorous with scutal lobe frontally, dark brown posteriorly. Pseudosutural fovea distinct, dark brown or black, surrounded by light gray area. Scutellum grayish brown with distinct darker brown medial line and narrowly light gray posterior margin. Mediotergite light grayish ochreous brown with indistinct darker brown medial line. Pleuron light brownish gray with few dark brown spots, largest on ventral side of katapisternum. Dorsopleural membrane brownish gray. Wing milky, subhyaline, yellowish at base, pattern consists of five, six or seven larger dark brown spots along frontal margin, numerous spots at cross-veins and at vein tips along wing margin, numerous small dots along veins and in all cells. Spots at frontal margin distinctly narrower



than interspaces. Stigma dark brown. Veins dark brown, yellowish at wing base and in costal area. Venation typical for the genus, radial sector arcuate at base, *m-cu* at about one-third of discal cell's length. Cell *m*₁ long, 1.3 times as long as its stem. Anal vein slightly sinuous, arched before wing margin. It reaches wing margin slightly beyond level of supernumerary cross-vein in cell *bm*, base of radial sector short distance before supernumerary cross-vein. Distal wing cells without macrotrichiae. Male wing distinctly widened along posterior margin, widest at tip of anal vein. Male halter 0.7 mm long with pale yellow stem, slightly darker base and distinctly dark brown knob. Coxae dark brown, sparsely dusted with gray. Fore trochanter yellowish brown, middle darker brown, posterior dark brown. Femur light brownish yellow, brighter yellow beyond middle, with distinct wide dark brown ring at apex. Tibia yellow with narrowly dark brown apex. Two basal tarsomeres yellow with slightly darkened apices. Remaining tarsomeres brown to darker brown. Claw dark brown. Male femur II: 4.0 mm long, III: 4.4 mm, tibia II: 3.5 mm, III: 3.3 mm, tarsus II: 2.9 mm, III: 2.6 mm. **Abdomen.** Brown, tergites yellowish brown with widely dark brown posterior and lateral margins. Pregenital segment dark brown, male genitalia brown. Posterior margin of epandrium nearly straight with wide

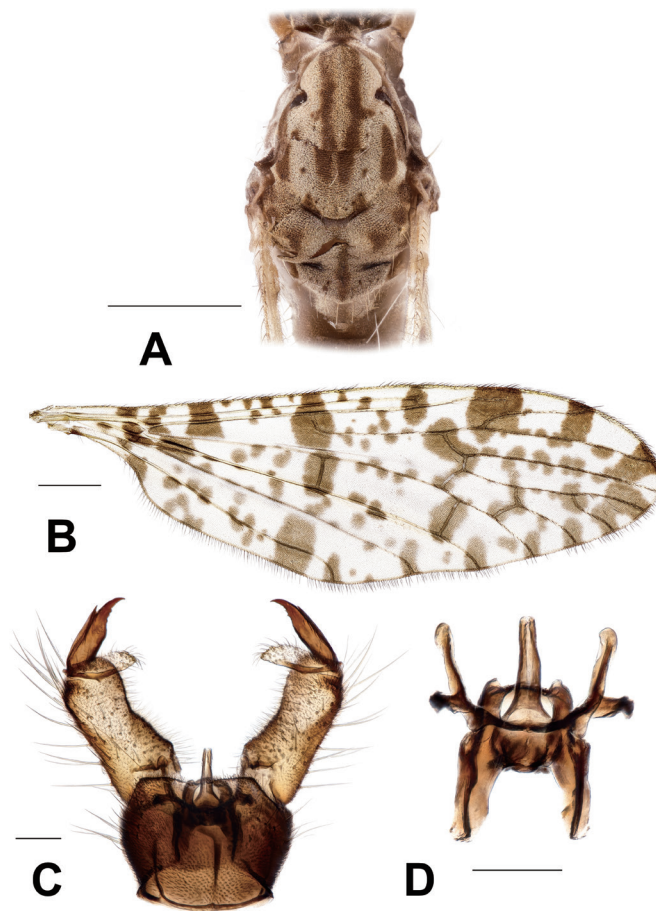
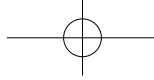


Fig. 45. *Eloephila lilliputina* (Alexander, 1936), male. **A.** Thorax, dorsal view; **B.** Wing; **C.** Genitalia, dorsal view; **D.** Aedeagal complex, dorsal view. Scale bars: A, B = 0.5 mm; C, D = 0.1 mm.





and very shallow emargination at middle. Gonocoxite elongate, 2.3 times as long as widest part at base, slightly arched. Outer gonostylus long, basal half parallel-sided; distal sickle- or claw-shaped, narrows towards acute tip, inner margin of it concave and serrate, outer margin smooth; crest on outer margin of gonostylus extends into acute spine at about four-fifths of gonostylus length; inner margin of gonostylus with blunt rounded angle at about middle. Inner gonostylus pale with dark brown inner margin, parallel-sided with blunt setose apical portion. Paramere with long slender drum stick-shaped mesal lobe lacking any setae, lateral lobe short, blackened distally. Aedeagus nearly straight in dorsal view, extending slightly beyond apex of mesal process of paramere, blunt-apexed. Lateral projection of lower shelf short and rounded. Lateral apodeme elongate, plate-shaped. Sperm pump (vesica) subglobular. Apodeme of vesica directed ventrally and not visible in dorsal view.

ELEVATION. From 300 m to 1000 m.

FLIGHT PERIOD. From late June to middle of August.

HABITAT. Margins of rivers.

GENERAL DISTRIBUTION. Japan (Honshu and Kyushu Islands).

EXAMINED MATERIAL. Holotype (as *Limnophila (Elaeophila) liliputina*) [one “1”, male (wing, genitalia and abdomen slide-mounted), Japan, Kyoto, Kibune, August 17, 1932, Tokunaga #10 (USNM); male (pinned), Japan, Aomori, Hirosaki City (LT), Koguriyama, Inekari River, August 1, 2013, D. Kato (NRC).

40. *Eloeophila lucasi* Starý, 2009a (Fig. 46, Pl. 7F)

Eloeophila lucasi Starý, 2009a: 432–434; Starý, Oboňa, 2020: 131; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration dark brown dusted with gray. Male body length 7.1 mm, wing length 7.4–9.4 mm. **Head.** Dark brown, posteriorly covered with dense short brownish setae, few long setae dorso-posteriorly and along eye margin. Male antenna 1.3–1.4 mm long, nearly reaching base of wing if bent backwards. Both basal antennomeres dark brown. Flagellum light brown, darker distally. Basal flagellomere pale yellow at base. Four flagellomeres oval, remaining segments elongate, three basal flagellomeres dilated ventrally. Longest verticils 1.6 times as long as respective segment. Rostrum dark brown. Palpus black. **Thorax.** Pronotum grayish ochreous with dark brown median line. Prescutum and presutural scutum ochreous gray or brownish gray, distinctly patterned with dark brown stripes. Medial stripes short, starting from frontal margin of sclerite, turning narrower posteriorly and reaching only to about middle of sclerite slightly beyond pseudosutural fovea. Both stripes separated by grayish area slightly narrower than stripe and short narrow longitudinal dark brown line in the middle. Lateral stripe indistinct and reduced to frontal spot in some specimens, more distinct in other. Most distinct intermediate narrow stripe starting slightly beyond pseudosutural fovea and reaching scutal lobe. Oblique stripe beyond pseudosutural fovea connected with lateral or intermediate stripe and forming asymmetrical letter “V”. Lateral margin of sclerite darkened. Scutal lobe light brownish gray or silvery gray with indistinct darker spot at middle and small but distinct spot at the end of intermediate stripe of scutum. Area between lobes dark brown, this line extends to the posterior margin of scutellum. Pseudosutural fovea distinct, dark brown or black, surrounded by light gray area. Scutellum light grayish brown with distinct dark



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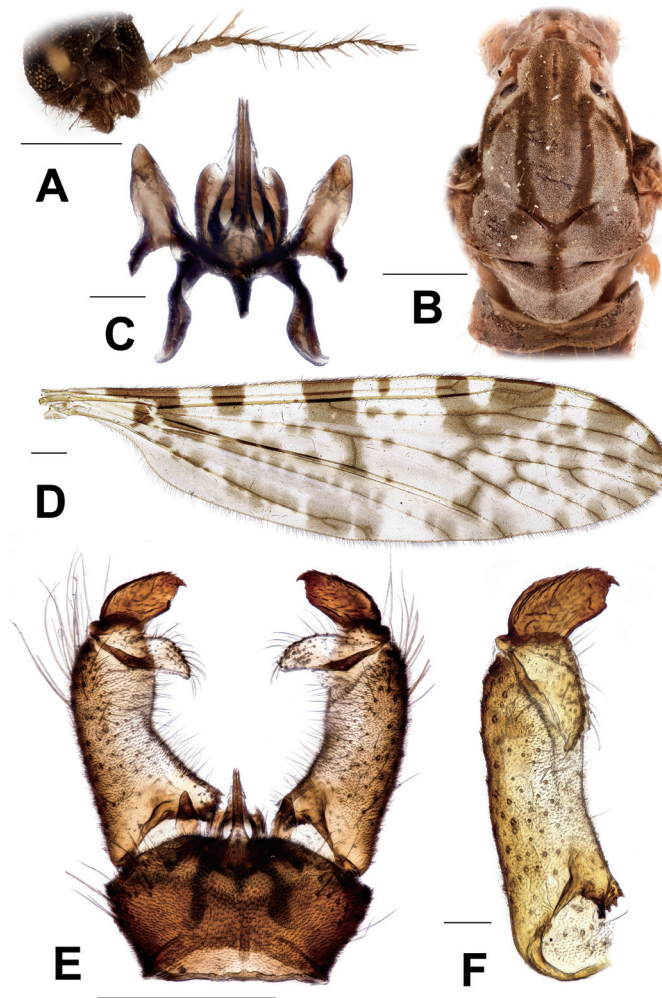
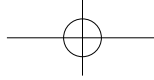


Fig. 46. *Eloeophila lucasi* (Alexander, 1936), male. **A.** Antenna; **B.** Thorax, dorsal view; **C.** Aedeagal complex, dorsal view; **D.** Wing; **E.** Genitalia, dorsal view; **F.** Gonocoxite with gonostyles, fronto-dorsal view. Scale bars: A, B, D, E = 0.5 mm; C, F = 0.1 mm.

brown medial line and narrowly light gray posterior margin. Mediotergite light brownish gray with indistinct darker brown medial line or just spot at frontal margin. Pleuron dark brownish gray with dark brown spots, largest on ventral side of katepisternum. Dorsopleural membrane yellowish brown to pale brown. Wing milky, subhyaline, yellowish at base, pattern consists of seven larger dark brown spots along frontal margin, numerous spots at cross-veins and at vein tips along wing margin, numerous small dots along veins and in most cells except at frontal wing margin. Spots at frontal margin before tip of *Sc* distinctly narrower than interspaces, wider than interspaces beyond tip of *Sc*. Stigma grayish brown. Veins dark brown, yellowish at wing base and in costal area. Venation typical for the genus, radial sector arcuate at base, *m-cu* at about middle of discal cell or slightly beyond it. Cell *m*₁ long, 1.6 times as long as its stem. Anal vein nearly straight, arched before wing margin and





short-spurred at the base of arch. It reaches wing margin beyond level of supernumerary cross-vein in cell *bm*, base of radial sector about same distance before supernumerary cross-vein. Distal wing cells with macrotrichiae. Male wing narrow with posterior margin evenly curved, widest slightly beyond tip of anal vein. Halter 1.0–1.2 mm long with pale brownish stem, brownish orange at base and with distinctly dark brown knob. Coxae brown, darker dorsally, lighter ventrally, sparsely dusted with gray. Trochanters reddish brown, fore trochanter more yellowish. Femur yellow with distinct dark brown ring at apex. Tibia yellow with narrowly dark brown apex. Basal tarsomere brownish yellow, darkened distally. Remaining tarsomeres brown to dark brown. Claw black. Male femur I: 6.5 mm long, II: 6.6 mm, III: 6.7 mm, tibia I: 7.0 mm, II: 5.7 mm, III: 6.9 mm, tarsus I: 7.5 mm, II: 5.1 mm, III: 4.7 mm. **Abdomen.** Brown to dark brown, tergites and especially sternites yellowish basally. Pregenital segment dark brown, male genitalia brown. Posterior margin of epandrium evenly rounded with very shallow emargination at middle. Gonocoxite elongate, 2.4 times as long as widest part at base, moderately arched, basal part slightly enlarged and armed with three small spines ventro-mesally. Outer gonostylus wide, terminating in curved spine, outer margin serrate at distal half, inner margin with subapical angle rounded, moderately pronounced. Crest on outer margin raised upwards, evenly rounded, without terminal spine. Inner gonostylus pale with dark brown inner margin at basal half, setose and blunt-apexed. Paramere with long mesal lobe that narrows towards apex, rounded at tip, lacking any setae, lateral lobe short, narrow and black. Aedeagus straight in dorsal view, extending distinctly beyond apex of mesal process of paramere. Lateral projection of lower shelf slightly extended posteriorly, rounded. Lateral apodeme elongate, wide and curved. Sperm pump (vesica) ovoid. Apodeme of vesica directed anteriorly, long spike-shaped.

ELEVATION. From 600 m to 1300 m.

FLIGHT PERIOD. From beginning of May through to beginning of August.

HABITAT. Margins of streams and springs.

GENERAL DISTRIBUTION. Georgia, Italy (southern part and Sicily).

EXAMINED MATERIAL. Paratype, one male (pinned), Italy, Sicilia, Biviere di Cesaro, altitude 1200–1300 m, July 30, 1961, Exc. v.d. Goot, Lucas Theowald, Verbene (NRC); paratypes, two males (pinned, wing slide-mounted), Italy, Sicilia, Biviere di Cesaro, altitude 1200–1300 m, August 6, 1961, Exc. v.d. Goot, Lucas Theowald, Verbene (Naturalis, RMNH.INS 1543981–2).

REMARK. Differs from *E. sparsipunctum* by slender aedeagus and narrow ovoid vesica. In *E. sparsipunctum* aedeagus stout, vesica broad, spherical.

41. *Eloeophila maculata* (Meigen, 1804) – Large Mottled Linkwing (Figs. 2, 47, Pl. 8A)

Limonia maculata Meigen, 1804: 61;

Limnobia marmorata Meigen, 1818: 121–122;

Limnobia decora Haliday, 1833: 153;

Idioptera marmorata Staeger, 1840: 28; Edwards, 1921: 221;

?*Limnophila guttata* Macquart, 1834: 97;

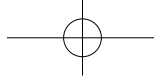
Ephelia marmorata Schiner, 1864: 550; Meijere, 1921: 57–59; Pierre, 1924b: 118; Nielsen, 1925: 68; Czižek, 1931: 121–123; Lackschewitz, 1940: 72–73;



- Ephelia spoliata* Loew, 1871: 14; Pierre, 1924b: 118; Nielsen, 1925: 70; Czižek, 1931: 121;
Limnophila (Elaeophila) maculata Edwards, 1938: 79–81; Coe, 1950: 42; Brindle, 1958: 61; 1967: 201; Brindle, Bryce, 1960: 215;
Ephelia marmorata var. *melanoptera* Lackschewitz, 1940: 73–74;
Ephelia marmorata var. *spoliata* Lackschewitz, 1940: 73;
Limnophila (Elaeophila) maculata var. *decora* Edwards, 1938: 80; Coe, 1950: 42;
Limnophila (Elaeophila) maculata var. *aegle* Edwards, 1938: 81;
Limnophila (Eloeophila) maculata Cramer, 1968: 184; Slipka, Starý, 1977: 51; Mendl, 1978: 44; Pokorný, 1978: 135–137; Hewitt et al., 2005: 38;
Eloeophila marmorata Savchenko, 1986: 311–313; 1989: 84; Polevoi, 2006: 96;
Eloeophila (Eloeophila) maculata Ujvarosi, Poti, 2006: 256; Ujvarosi, 2007: 230;
Eloeophila maculata Simova-Tosic, 1992: 141; Podenas, 1995: 38, 39; Starý, Oosterbroek, 1996: 55; Starý, Geiger, 1998: 74; Schacht, 1999: 134; 2005: 5; Godfrey, 2000: 22; 2001: 23; Pakalniskis et al., 2000: 6; 2006: 19; Reusch, Oosterbroek, 2000: 155; Petersen, Jong, 2001: 149; Reusch, Bellstedt, 2001b: 72; Salmela, 2001: 144, 146, 150; 2004: 9; 2008: 27; 2010: 12; 2012a: 237; 2012b: 11; Eiroa, Baez, 2002: 54; Jong, Oosterbroek, 2002; Podeniene, 2002: 299, 306; 2003a: 124–126, 144, 175–176, 267; 2003b: 20, 21, 29; Podeniene, Gelhaus, 2002: 68; 2010: 188; Koç, 2004: 21, 86, 116–118, 150; Parvu, 2003: 233; 2004: 184; 2006: 260; Oosterbroek, Simova-Tosic, 2004: 445; Ashe et al., 2005: 313, 317, 321, 322, 335; 2008: 13; Starý, 2004; 2009a: 427; 2009b: 24; Koç et al., 2005: 616; 2016: 196; Ruckert, 2005: 53, 55, 57–60, 69, Attachment; Starý et al., 2005: 24; Ujvarosi, 2005: 244; Wittrock, 2005: 84; Chaniecka, Wiedenska, 2006: 147; Heaver, 2006: 78; Podenas et al., 2006: plate 47; Reusch, 2006: 134; Reusch, Schrankel, 2006: 178–179; Ahonen, 2007: 8, 24; Boardman, 2007: 62; 2016: 130; Ruckert et al., 2007: 56; Salmela et al., 2007: 45; 2015: 101; Wiedenska, 2007: 75; 2010: 132; 2014: 12; 2015: 52; 2017: 12; Chandler et al., 2008: 11; Podenas, Podeniene, 2008: 347, 352; Ribeiro, 2008: 631, 635, 655, 671, 677, 681, 682, 683, 684, 691; Lehmann, Reusch, 2009: 122; Leskova, 2009: 114, 116; Ozgul et al., 2009: 63; Reusch, Hohmann, 2009: 129; Skidmore, 2009: 128; Cranston, Drake, 2010: 175; Hable et al., 2010: 91; Drake, 2011: 24; Kramer, 2011: 18; Krivosheina, Krivosheina, 2011: 220; Ujvarosi et al., 2011: 105, 107; Dufour, Merz, 2012: 354; Keresztes, 2012: 30; Reusch, Heiss, 2012: 316; Fritz, Lindstrom, 2013: 62; Kolcsar et al., 2013, 71; 2015: 30; 2021: 91; Reusch, Weber, 2013: 268, 271; Hewitt, 2014: 13; Salmela, Petrasianas, 2014: 27; Bilgin et al., 2015: 6; Chuzhekova, 2015: 49, 56, 64, 65, 96, 211, 240; 2016: 11, 32; Hubenov, 2015: 220; 2016: 47; 2017: 47; 2018: 15; 2021: 30; Lindstrom, Fritz, 2015: 44, 47; Mederos, Eiroa, 2015: 266; 2018: 27; Obona, 2016: 138; Brighton, 2017: 27; Byriel, Rojas, 2017: 118; Vogtenhuber, Kofler, 2017: 138; Lantsov, Pilipenko, 2018: 79; Olsen et al., 2018: 158, 159; Starý, Vonicka, 2018: 49; Stuke, 2019: 142; Eiroa, Carles-Tolra, 2019: 131; Devyatkov, 2020: 269–270; Hancock, 2020: 97; Oosterbroek, Dek, 2020: 16, 19, 20; Pilipenko, 2020: 357; Quindroit, 2020a: 14, 30, 46; 2020b: 135, 145; Snegovaya, 2021: 1145–1146; Stubbs, 2021: 328; Tack et al., 2021: 193, 253; Kramer, Morris, 2022: 5; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration light brown dusted with gray. Male body length 6.3–8.8 mm, that of female 10.5–12.0 mm, male wing length 6.7–10.2 mm, female 11.0–11.2 mm.
Head. Brown, vertex with dark brown spot medially, narrowly grayish along eye margin, covered





with sparse light brown setae. Male antenna 1.3–2.1 mm long, nearly reaching base of wing if bent backwards. Female antenna 1.5–2.1 mm long. Scapal segment elongate, sub-cylindrical, dark brown dusted with gray, nearly twice as long as second antennomere. Pedicel brown, oval. Four basal flagellomeres brownish yellow, middle flagellomeres brown, distal dark brown. Six basal flagellomeres oval, remaining elongate. Four basal flagellomeres dilated ventrally. Apical segment elongate, club-shaped slightly exceeds preceding segment in length. Longest verticils 1.4 times as long as respective segment. Rostrum brown. Palpus dark brown. **Thorax.** Pronotum brownish gray with dark brown medial stripe, postpronotum ochreous gray. Prescutum and presutural scutum gray, frontally ochreous gray, distinctly patterned with dark brown stripes. Pattern variable depending on specimen. Length of medial stripes variable, they start at frontal margin of sclerite and reach only to the middle or much further, but far not reaching posterior margin of sclerite. They are separated by ochreous gray area that is same width or slightly narrower than stripe. Dark, broken, usually indistinct, medial vita extends along whole length of sclerite. Lateral stripe short and narrow, but oblique stripe behind pseudosutural fovea, connecting lateral and medial stripes, distinct in all specimens. Intermediate stripe complete and distinct in darker specimens but broken into few dark dots in light specimens. Lateral margin of sclerite dark brown. Scutal lobe brownish gray or bluish gray with small dark spot frontally as an extension of intermediate stripe and larger but less distinct spot posteriorly. Area between lobes light gray or ochreous gray with dark brown medial line that extends onto scutellum. Posterior margin of scutellum light gray, whole dorsal surface darker gray or brownish gray. Mediotergite light gray with indistinct darker medial line. Pseudosutural fovea distinct, black, surrounded by yellowish gray area. Pleuron brown, dusted with gray, small dark brown spot in the middle of katepisternum and on katepimeron. Dorsopleural membrane yellowish brown. Wing whitish or grayish, subhyaline, yellowish at base, pattern consists of seven larger dark brown spots along frontal margin, numerous spots at cross-veins and at vein tips along wing margin, numerous small dots along veins and in most cells. Spots at frontal margin before tip of *Sc* distinctly narrower than interspaces, wider than interspaces beyond tip of *Sc*. Stigma dark brown. Wing pattern varies from light with nearly all dots missing to dark with numerous dots and large dark areas. Veins pale grayish brown, pale yellowish at wing base and in costal area. Venation typical for the genus, radial sector angulate at base, *m-cu* at about middle of discal cell. Cell *m*₁ long, twice as long as its stem. Anal vein nearly straight, arched before wing margin and short-spurred at the base of arch. It reaches wing margin distinctly beyond level of supernumerary cross-vein in cell *bm*, base of radial sector distinctly before supernumerary cross-vein. Distal wing cells without macrotrichiae. Male wing distinctly extended posteriorly, widest at tip of anal vein. Male halter 0.8–1.4 mm long, female 1.1–1.4 mm, with pale stem, brownish orange base and with distinctly dark brown knob. Fore coxa brown, middle and posterior dark brown with yellowish ventral margin. Trochanters brownish yellow. Femur yellow with distinct dark brown ring at apex. Tibia yellow with narrowly dark brown apex. Basal tarsomere brownish yellow, darkened distally. Remaining tarsomeres brown to dark brown. Claw black. Male femur I: 5.3–6.9 mm long, II: 4.0–7.5 mm, III: 4.6–7.8 mm, tibia I: 5.2–7.2 mm, II: 4.3–6.5 mm, III: 4.8–7.6 mm, tarsus I: 4.4–6.8 mm, II: 3.3–5.6 mm, III: 3.3–5.4 mm. Female femur I: 6.5–7.1 mm long, II: 6.7–7.7 mm, III: 5.4–7.6 mm, tibia I: 7.0–7.5 mm, II: 6.4–6.7 mm, III: 5.3–7.5 mm, tarsus I: 5.8–6.7 mm, II: 5.7–5.8 mm, III: 4.0–5.5 mm. **Abdomen.** Basal segment dark brown dusted with yellowish gray. Tergites and sternites of second to sixth segments light brown with wide dark brown posterior and lateral margins. Pregenital segment entirely dark.



Male genitalia dark brown with contrastingly brownish yellow gonocoxite. Epandrium extended caudally (especially distinct in lateral view), posterior margin nearly straight, postero-lateral angle rounded. Hypandrium with distinct peg-shaped extension medially (well visible in lateral view). Gonocoxite elongate, 2.6 times as long as widest part at base, moderately arched, basal part slightly enlarged. Outer gonostylus wide, terminating in curved spine, outer margin serrate at distal half, inner margin with subapical angle pronounced. Crest on outer margin wide, raised upwards, evenly rounded, without terminal spine. Inner gonostylus pale with dark brown inner margin at basal two-thirds, setose, narrows towards blunt apex. Paramere with elongate, wide, blunt-apexed mesal lobe, covered with fine setae caudally, lateral lobe short, black and extended into finger-like lobule. Aedeagus straight and short in dorsal view, far not reaching apex of mesal process of paramere. Lateral projection of lower shelf slightly extended posteriorly, rounded. Lateral apodeme elongate and sinuous. Sperm pump (vesica) ovoid. Apodeme of vesica directed anteriorly, long, peg-shaped, darkened, brown or dark brown.

ELEVATION. From sea level to 2000 m.

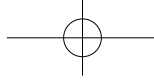
FLIGHT PERIOD. From late May through to late September.

HABITAT. Larvae develop in sandy bottoms of small streams and springs. Typically found in lowlands by shaded ditches and woodland streams, under carr and at seepages, even in open situations. In the uplands, it is largely a species of valleys and shaded ravines (Stubbs, 2021); brooks, small rivers, swamps, moist soil (Ujvarosi, 2005). Adults are attracted to light.

GENERAL DISTRIBUTION. Widespread through Europe (Austria, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France (including Corsica), Germany, Great Britain, Greece (Crete), Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Montenegro, Netherlands, North Macedonia, Norway, Poland, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, European part of Turkey, Ukraine, European part of Russia), and Western East Palearctic (Armenia, Azerbaijan, Georgia, Iran, North Caucasus, Asiatic part of Turkey, Eastern and North West Kazakhstan).

EXAMINED MATERIAL. One male (pinned), Spain (Léz.), Val de Tredos, June 27, 1950, F. Schmid (MCSN-VD); two males (pinned, genitalia of one male in microvial with glycerol on same pin), Iran, Zanuz, altitude 2000 m, September 21, 1955, Schmid (USNM); one male (pinned), Holland, Plasmolen, well area near Old Windmill, June 1, 1968, D.C. Geijskes (Naturalis, RMNH.INS.1543979); one female (pinned), Holland, Plasmolen, well area, June 2, 1968, D.C. Geijskes (Naturalis, RMNH.INS.1543978); two males (pinned, genitalia of one male in microvial with glycerol on same pin), Iran (NC), Demavend, Demavend Mountain, July 17, 1976, A. Lavalée (USNM); one male (in ethanol, wing slide-mounted), Switzerland, Promentavse, Vich, May 19, 1977 (MHNN); one male (pinned), Switzerland, Luzern, Hasle, Balmoos, 970 m, August 17, 1977, L. Rezbanyai (MHNN); three females (in ethanol), Switzerland, Vaud, Bois de Chênes, Pt. 516 m, May 21 – July 22, 1979, C. Dufour, W. Geiger, T. Malaise lumineuse (VU); two males, one female (in ethanol, wing slide-mounted), Switzerland, Zürich, Wald, June 10–11, 1979, W. Geiger (MHNN); one male (in ethanol), Switzerland, Genève, Croix-de-Rozon, June 25 – July 1, 1979, C. Dufour, W. Geiger, T. Malaise lumineuse (MHNN); two males (in ethanol, wing slide-mounted), Switzerland, Genève, Croix-de-Rozon, July 16 – August 5, 1979, C. Dufour, W. Geiger, T. Malaise lumineuse (MHNN); one male (in ethanol), wing slide-mounted, Switzerland, Genève, Croix-de-Rozon, July 30 – August 5, 1979, C. Dufour, W. Geiger, T. Malaise lumineuse (MHNN); one male





(in ethanol), Switzerland, Ticino, Curio, September 9, 1979, W. Geiger (MHNN); one male (in ethanol, wing slide-mounted), Switzerland, Ticino, Curio, September 11, 1979, W. Geiger (MHNN); one male (in ethanol, wing slide-mounted), Switzerland, Zürich, Husemensee, July 4, 1980, W. Geiger (MHNN); one male (in ethanol, wing slide-mounted), Switzerland, Zürich, Wädenswil, altitude 450 m, July 14–20, 1980, C. Dufour, W. Geiger, T. Malaise lumineuse (MHNN); one male (in ethanol), Switzerland, Zürich, Birmensdorf, altitude 540 m, July 21–27, 1980, C. Dufour, W. Geiger, T. Malaise lumineuse (MHNN); one male (in ethanol), Switzerland, Zürich, Birmensdorf, altitude 540 m, July 30 – August 6, 1980, C. Dufour, W. Geiger, T. Malaise lumineuse (MHNN); three males (in ethanol), Switzerland, Zürich, Birmensdorf, altitude 540 m, August 4–10, 1980, C. Dufour, W. Geiger, T. Malaise lumineuse (MHNN); one male (in ethanol), Switzerland, Zürich, Birmensdorf, altitude 540 m, August 18–24, 1980, C. Dufour, W. Geiger, T. Malaise lumineuse (MHNN); one male (pinned), Lithuania, Ukmerge district, Vidiskiai, village Zujai, May 28, 1985, G. Svitra (VU); one specimen of unknown sex (pinned), Lithuania, Vilnius environs, deciduous forest near small stream, June 21, 1985, S. Podenas (VU); one male (pinned), Lithuania, Ukmerge district, Vidiskiai, village Zujai, July 14, 1985, G. Svitra (VU); one male (pinned), Lithuania, Ukmerge district, Vidiskiai, village Zujai, August 7, 1985, G. Svitra (VU); three males (pinned), Lithuania, Varena district, margin of river Skroblus, May 20, 1988, S. Podenas (VU); two males, one female (pinned), Lithuania, Varena district, margin of river Skroblus, May 22, 1988, S. Podenas (VU); seven males, two females (pinned), Lithuania, Varena district, Puvociai, May 26, 1988, S. Podenas (VU); one male (pinned), Lithuania, Vilnius district, Sudervele, June 4, 1988, S. Podenas (VU); one male, one female (pinned), Lithuania, Vilnius district, Skersabalai, June 5, 1988, S. Podenas (VU); one male (pinned), Lithuania, Trakai district, Zukai, June 6, 1988 (VU); one male (pinned), Lithuania, Varena district, Puvociai, June 30, 1988, S. Podenas (VU); one male (pinned), Lithuania, Varena district, Puvociai, July 6, 1988, S. Podenas (VU); one male (pinned), Lithuania, Kretinga district, July 29, 1988 (VU); one male, one female (pinned), Lithuania, Kretinga district, July 29, 1988, S. Podenas (VU); seven males, two females (pinned), Lithuania, Varena district, Puvociai, August 3, 1988, S. Podenas (VU); six males, one female (pinned), Lithuania, Varena district, margin of river Skroblus, May 20, 1989, S. Podenas (VU); one male (pinned), Lithuania, Birzai district, forest Birzu Giria, June 17, 1989, S. Podenas (VU); one male (in ethanol), France, 4 km E Bourg-Madame (Ste Léocadie), altitude 1298 m, June 19, 1991 (MHNN); one male (in ethanol), France, 6 km SW Puigcerdá (Ger), altitude 1120 m, June 19, 1991 (MHNN); one male (in ethanol, wing slide-mounted), France – Pyr. Orientales, Pyrénées, 4.5 km SW Formiguères, Etang de Balcère, altitude 1800 m, June 20, 1991, C. Dufour, W. Geiger, J.P. Haenni, stream margin in open boggy forest area (MHNN); one male (pinned), Lithuania, Marijampole district, Juodeliai, June 21, 1992, D. Ceputis (VU); one male (in ethanol), Lithuania, Taurage district, Viesvile Nature Reserve, May 5, 1993, V. Dobrovolskyte (VU); one male (in ethanol), Lithuania, Varena district, margin of river Merkys, May 13, 1994, V. Dobrovolskyte (VU); one male, two females (in ethanol), Lithuania, Varena district, margin of river Skroblus, May 14, 1994, V. Dobrovolskyte (VU); four males, four females (in ethanol), Lithuania, Kaisiadorys district, Lapainia forest, May 30, 1994, V. Dobrovolskyte (VU); five males, four females (in ethanol), Lithuania, Kaisiadorys district, Basonys, August 8, 1994, V. Dobrovolskyte (VU); one female (in ethanol), Lithuania, Kaisiadorys district, Kriauciskes, August 11, 1994, V. Dobrovolskyte (VU); one male (in ethanol, wing slide-mounted), France, Alpes Maritimes, St-Etienne de Tinée 9.5 km NW, altitude 1985 m, July 13, 1995, C. Dufour, W. Geiger,



stream at refuge of Bousiéyas swamp slope (MHNN); one male (pinned), Lithuania, Varena distr., Ziurai, July 6, 1997, S. Podenas (ANSP); one male (pinned), Lithuania, Trakai distr., Lazdėnai env., river Bražuolė, May 19, 1998, S. Podenas (ANSP); one male (pinned), Lithuania, Varena distr., river Merkys, June 8, 1998, S. Podenas (ANSP); two males, one female (pinned), Lithuania, Varena district, Dubinykas, N 54.09484°, E 24.28546°, July 30, 2022, S. Podenas (NRC); one female (pinned), Lithuania, Vilnius district, sanctuary Raudonoji Bala, N 54.84900°, E 25.22454°, June 18, 2023, S. Podenas, at light (NRC); one male (pinned), Lithuania, Varena district, Marcinkonys env., river Gruda, N 54.09289°, E 24.37480°, August 6, 2023, S. Podenas, at light (NRC).

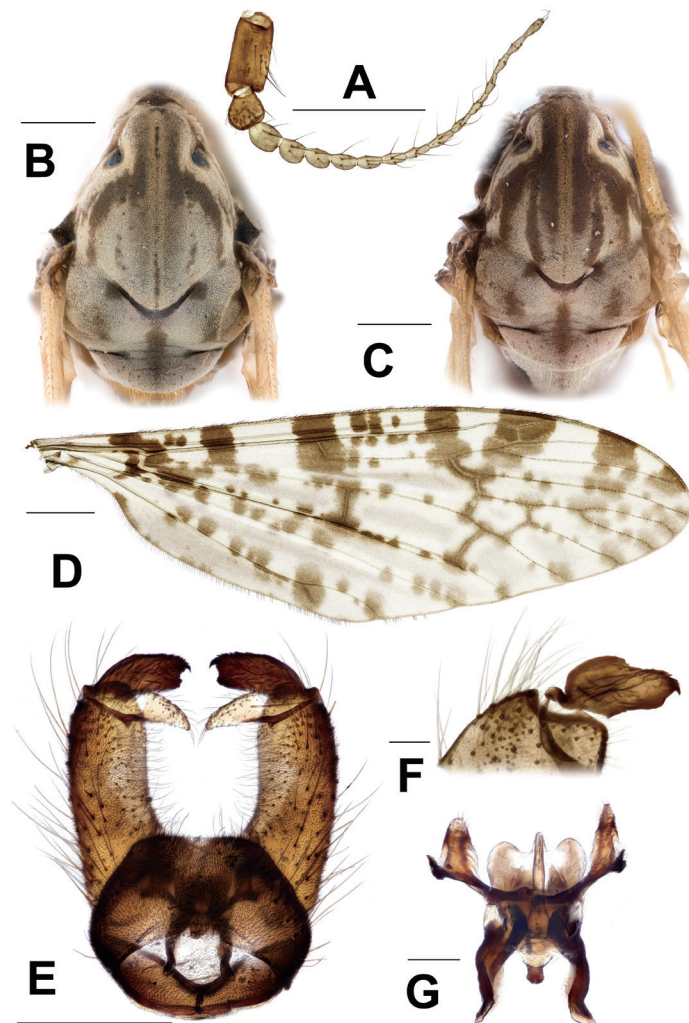
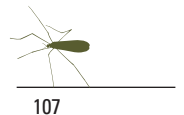
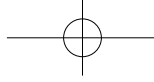


Fig. 47. *Eloeophila maculata* (Meigen, 1804), male. **A.** Antenna; **B.** Thorax, dorsal view; **C.** Thorax, dorsal view, variation; **D.** Wing; **E.** Genitalia, dorsal view; **F.** Outer gonostylus, fronto-dorsal view; **G.** Aedeagal complex, dorsal view. Scale bars: A, B, C, E = 0.5 mm; D = 1.0 mm; F, G = 0.1 mm.





42. *Eloeophila marmorataeformis* (Riedel, 1914) (Fig. 48, Pl. 8B)

Ephelia marmorataeformis Riedel, 1914: 87–88;

Limnophila (*Elaeophila*) *marmorataeformis* Alexander, 1956b: 283;

Eloeophila marmorataeformis Oosterbroek, 2023.

DESCRIPTION. General. Body coloration yellowish brown. Male body length 4.2–7.5 mm, wing length 6.1–6.3 mm. **Head.** Brown, dusted with gray, narrowly grayish along eye margin, covered with sparse brownish setae. Male antenna 0.9–1.1 mm long, reaching base of wing if bent backwards. Both basal segments brown to dark brown, dusted with gray. Scapal segment elongate, sub-cylindrical, nearly twice as long as pedicel. Flagellomeres oval, brownish yellow, darker towards apex, apical segment large, slightly exceeds preceding segment in length. Longest verticils 1.6 times as long as respective segment. Rostrum brown, darker brown dorsally at base. Palpus dark brown. **Thorax.** Pronotum brownish-grayish yellow with dark brown medial line. Prescutum and presutural scutum ochreous frontally, brownish ochreous caudally, distinctly patterned with dark brown stripes. Medial stripe broken at middle, not reaching suture. Both stripes separated by ochreous area wider than stripe frontally, narrower caudally, and short narrow line starting from frontal margin of sclerite. Lateral stripe long, reaching suture, could be complete or broken at middle. Interspace with six distinct dark brown dots, posterior two dots merge into short line. Lateral margin of sclerite not darkened. Scutal lobe dark brown with narrowly yellowish margins. Area between lobes with dark brown stripe that extends onto scutellum and mediotergite. Scutellum brown with yellowish posterior margin. Mediotergite grayish yellow with darkened posterior and lateral margins. Pseudosutural fovea dark brown, surrounded by yellow area. Pleuron dark brown with few indistinct paler spots. Dorsopleural membrane brownish yellow. Wing whitish or grayish, subhyaline, yellowish at base, pattern consists of seven large dark brown spots along frontal margin, numerous spots at cross-veins and at vein tips along wing margin, numerous small dots along veins and in most cells. Spots at wing base, at base of R_s and at tip of R_l wider than interspaces. Stigma darker brown. Veins brown to dark brown in darkened areas, pale or yellowish in interspaces. Venation typical for the genus, radial sector angulate and short-spurred at base, $m-cu$ at about middle of discal cell. Cell m_1 long, slightly longer than its stem. Anal vein distinctly arched before wing margin. It reaches wing margin at about same level as supernumerary cross-vein in cell bm , base of radial sector distinctly before supernumerary cross-vein. Distal wing cells without macrotrichiae. Male wing narrow, posterior margin evenly rounded, widest beyond tip of anal vein. Stem of halter pale with brownish base, knob distinctly dark brown with pale base. Male halter 0.7–1.0 mm long. Coxae and trochanters brown. Femur yellow, paler at base, with brown ring before apex and distinctly but narrowly yellow tip. Darker ring indistinct on posterior pair. Tibia yellow with narrowly darkened apex. Basal tarsomere yellow with indistinctly and narrowly darkened apex. Remaining tarsomeres yellowish brown to brown. Claw blackish. Male femur I: 4.2–4.3 mm long, II: 4.6 mm, III: 4.8–4.9 mm, tibia I: 4.5–4.6 mm, II: 4.5 mm, III: 4.6–4.7 mm, tarsus I: 4.6 mm, II: 3.7 mm, III: 3.8–4.0 mm. **Abdomen.** Basal segments brownish-yellowish gray with widely dark brown posterior margin, posterior segments and pregenital segment dark brown. Male genitalia reddish dark brown with grayish brown gonocoxite. Epandrium with deeply concave posterior margin and small blackened lobule at postero-lateral angle. Gonocoxite elongate, twice as long as widest part at base, moderately arched, basal part slightly



enlarged. Outer gonostylus elongate, terminating in a distinct spine, outer margin serrate distally, inner margin with rounded subapical angle. Crest on outer margin not produced. Inner gonostylus pale with dark brown inner margin at basal half, setose, narrows towards blunt apex. Paramere with elongate, wide, blunt-apexed setoseless mesal lobe, lateral lobe elongate, slightly arched, not darker than mesal lobe. Aedeagus long and straight in dorsal view, reaching distinctly beyond apex of mesal process of paramere. Lateral projection of lower shelf arched and curved towards aedeagus. Lateral apodeme narrow, elongate and slightly darkened. Sperm pump (vesica) subglobular. Apodeme of vesica directed ventrally, visible through vesica as blackened triangle in dorsal view.

ELEVATION. From nearly 2000 m to more than 2200 m.

FLIGHT PERIOD. Middle of December.

HABITAT. Margins of rivers.

GENERAL DISTRIBUTION. Kenya, Uganda.

EXAMINED MATERIAL. Two males, one specimen with unclear sex (pinned), Uganda, Ruwenzori Range, December 1934 – January 1935, B.M.E. Afr. Exp., B.M. 1935-203, Namwamba Valley, altitude 1981 m (6500 ft), F.W. Edwards (NHMUK).

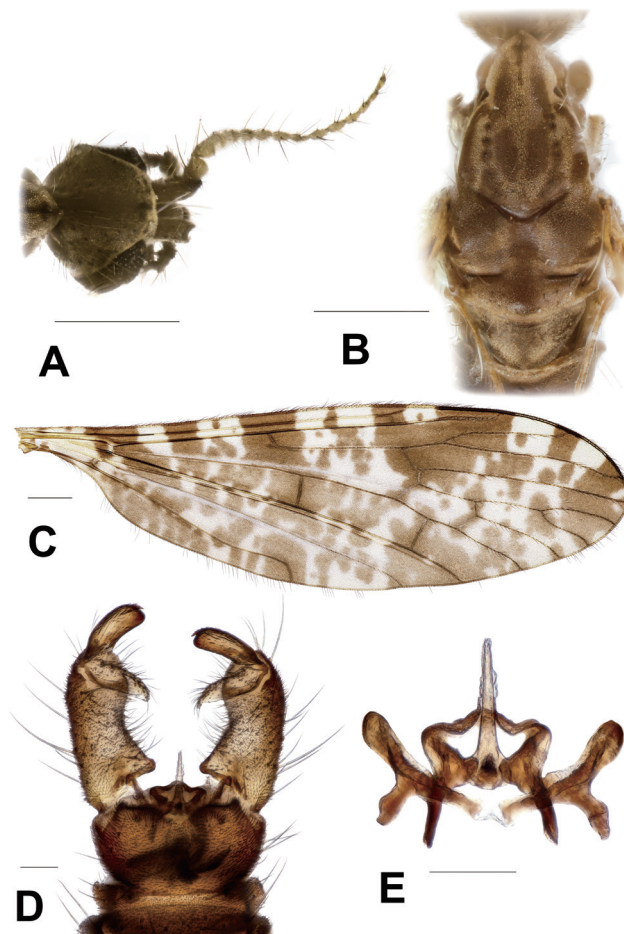
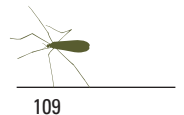
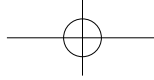


Fig. 48. *Eloeophila marmorataeformis* (Riedel, 1914), male. **A.** Head with antenna, dorsal view; **B.** Thorax, dorsal view; **C.** Wing; **D.** Genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A–C = 0.5 mm; D,E = 0.1 mm.





43. *Eloeophila marmorea* (Alexander, 1934) (Fig. 49, Pl. 8C)

Limnophila (*Elaeophila*) *marmorea* Alexander, 1934b: 455–456;

Eloeophila marmorea Oosterbroek, 2023.

DESCRIPTION. General. Body coloration dark brown, dusted with gray. Male body length 5.0 mm, wing length 5.2–5.9 mm. **Head.** Gray. Rostrum black. Palpus black. **Thorax.** Pronotum dark brown, dusted with gray. Prescutum and presutural scutum grayish brown, lateral and intermediate stripes indicated by narrow dark brown lines before suture. Interspace with four or five dark brown dots. Lateral margin of sclerite broadly and conspicuously dark brown. Scutal lobe dark brown with paler spots. Scutellum blackish. Mediotergite densely covered with grayish pruinosity. Pleuron dark brown with silvery and grayish spots. Wing whitish or grayish, subhyaline, yellowish at base and along costal area, pattern consists of four large dark brown spots, one at base of wing, sometimes broken in two, transverse sutures at base of *Rs* and at cord making “Y”-shaped pattern, and star-like spot at tip. Interspaces filled with abundant small dots. Veins yellowish, dark brown in darkened areas. Venation typical for the genus, radial sector angulate and short-spurred at base, *m-cu* slightly before middle of discal cell. Cell *m*₁ long, nearly twice as long as its stem. Anal vein distinctly arched before wing margin. It reaches wing margin far from the level of supernumerary cross-vein in cell *bm*, base of radial sector distinctly before supernumerary cross-vein. Distal wing cells without macrotrichiae. Male wing distinctly widened along posterior margin, widest at tip of anal vein, slightly widened along costal cell. Male halter 0.9 mm long. Coxae blackened. Trochanters yellow. Femur yellow with indistinct darker subterminal ring better visible on inner surface. Tibia and basal tarsomeres yellow, distal tarsomeres darkened. Femur I: 3.2 mm long, III: 3.9 mm, tibia I: 4.2 mm, III: 3.7 mm, tarsus I: 3.4 mm, III: 2.4 mm. **Abdomen.** Brownish black. Posterior margin of epandrium evenly rounded. Gonocoxite elongate, 1.7 times as long as widest part at base in slide-mounted specimens, narrows towards tip. Outer gonostylus elongate, terminating in a distinct claw-shaped spine and small spine at its base on outer margin, inner margin extended into triangle-shaped lobe subapically. Apical notch between spine and subapical lobe oval. Crest on outer margin distinct, apex with spine. Inner gonostylus pale with dark brown inner margin at basal half, setose, round-apexed. Paramere with elongate, narrow and arched mesal lobe, lateral lobe elongate, slightly arched, narrow at distal end. Aedeagus straight in dorsal view, reaching beyond apex of mesal process of paramere. Lateral projection of lower shelf extends along aedeagus. Lateral apodeme long and narrow. Sperm pump (vesica) large, oval. Apodeme of vesica bifid.

ELEVATION. From 550 m to 1000 m.

FLIGHT PERIOD. From December through to beginning of March.

HABITAT. Unknown.

GENERAL DISTRIBUTION. Indonesia (Java).

EXAMINED MATERIAL. Holotype (as *Limnophila* (*Elaeophila*) *marmorea*), male (wing, hind leg and genitalia slide-mounted), W. Java, Soekaboemi, altitude 549 m (1800 ft), March 8, 1933, M.E. Walsh (USNM); metatype (as *Limnophila* (*Elaeophila*) *granulata marmorea*), one male (pinned, leg, wing and genitalia slide-mounted), W. Java, Tjisarna, Mt. Pangrango, altitude 1000 m, December 1950, Lieftinek, on mantid tree (USNM).



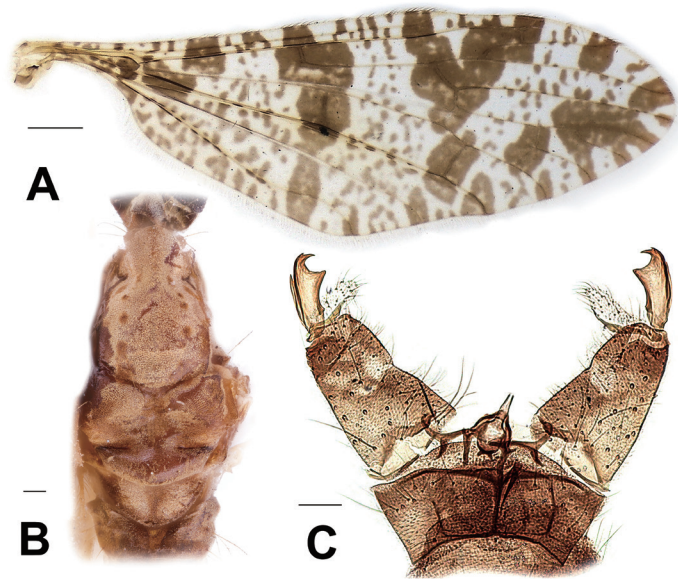


Fig. 49. *Eloeophila marmorea* (Alexander, 1934n), male. **A.** Wing; **B.** Thorax, dorsal view; **C.** Genitalia, dorsal view. Scale bars: A = 0.5 mm; B,C = 0.1 mm.

44. *Eloeophila maroccana* Starý, 2009a (Fig. 50, Pl. 8D)

Eloeophila maroccana Starý, 2009a: 434; Oosterbroek, 2023.

DESCRIPTION. Male. General. Body coloration brown to dark brown. Male wing length 5.3–6.2 mm. **Head.** Dark brown. Male antenna nearly reaching base of wing if bent backwards. Scape elongate, brown to dark brown, pedicel dark brown. Flagellum brown. Six basal flagellomeres oval, remaining segments elongate. Longest verticils 1.7 times as long as respective segment. Rostrum and palpus dark brown to black. **Thorax.** Pronotum dark brown, postpronotum brown. Prescutum and presutural scutum grayish dark brown with barely distinct median stripes. Stripe reaches suture. Area separating median stripes as wide as stripe itself. Scutal lobe blackish brown. Area between lobes brown. Scutellum dark brown, mediotergite black. Pseudosutural fovea black. Pleuron dark brown dorsally, brown ventrally. Wing brownish, subhyaline, yellowish at base, pattern consists of larger brown spots along frontal margin, darkening surrounding cross-veins and vein tips along wing margin. Small dots missing. Spots at frontal margin distinctly narrower than interspaces. Stigma dark brown. Veins brown, dark brown in darkened areas. Venation typical for the genus, radial sector arcuate at base, *m-cu* slightly before middle of discal cell. Anal vein nearly straight, slightly arched before wing margin. It reaches wing margin slightly beyond level of supernumerary cross-vein in cell *bm*, base of radial sector distinctly before supernumerary cross-vein. Male wing narrow, not extended posteriorly, widest at tip of vein *CuP*. Halter with pale stem and dark brown to black knob. Coxae and trochanters brown, posterior trochanter yellowish posteriorly. Femur yellowish brown, gradually darkens towards apex. Tibia brown. **Abdomen.** Tergites and sternites brown with widely



dark brown posterior and lateral margins. Posterior margin of epandrium with wide and shallow emargination at middle and low evenly rounded lobes on both sides of emargination. Gonocoxite elongate, 2.3 times as long as widest part at base, moderately arched, slightly enlarged at base. Outer gonostylus wide at basal half, terminating in small spine, outer margin serrate at distal half, inner margin evenly rounded, subapical angle not pronounced. Crest on outer margin wide, raised upwards, evenly rounded, without terminal spine. Inner gonostylus pale with dark brown inner margin at basal half, setose, narrows towards apex. Paramere with elongate mesal lobe, wide at middle, narrower distally, apex blunt and rounded, setoseless. Lateral lobe short and narrow, curved apically. Aedeagus long and straight in dorsal view, reaching far beyond apex of mesal process of paramere. Lateral projection of lower shelf extended into small tooth laterally, extended along aedeagus medially. Lateral apodeme long and narrow, slightly curved. Sperm pump (vesica) oval. Apodeme of vesica long and narrow, spine-shaped, directed anteriorly. *Female*. unknown.

ELEVATION. About 2500–2800 m.

FLIGHT PERIOD. From middle of May through to beginning of July.

HABITAT. Unknown.

GENERAL DISTRIBUTION. Spain, Morocco.

EXAMINED MATERIAL. Holotype, male (pinned), Morocco, Ht Atlas, Massif Toubkal, Okaïmeden, altitude 2500–2800 m, July 2–8, 1977, H. & T.V. Oorschot, E. Houkes & P. Oosterbroek (Naturalis).

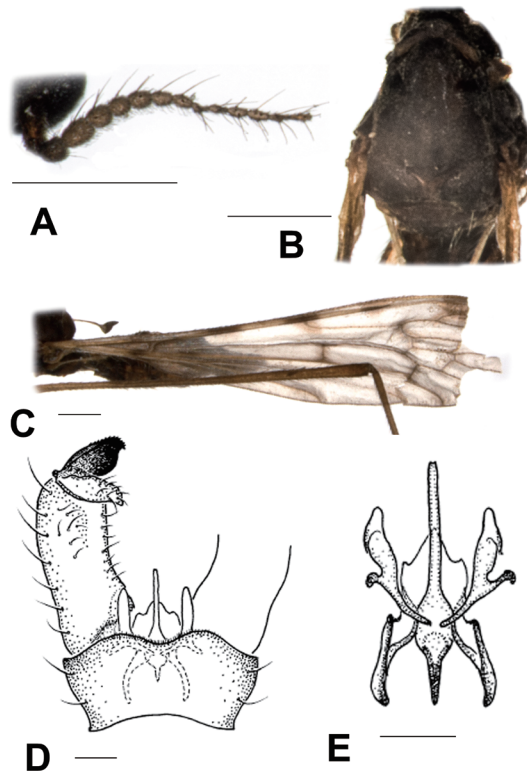
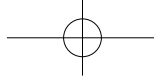


Fig. 50. *Eloeophila maroccana* Starý, 2009a, male. **A.** Antenna, holotype; **B.** Thorax, holotype, dorsal view; **C.** Wing, holotype; **D.** Genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A–C = 0.5 mm; D, E = 0.1 mm (D, E after Starý, 2009a).



45. *Eloeophila martinovskyi* Starý, 2009a (Fig. 51, Pl. 8E)

Eloeophila martinovskyi Starý, 2009a: 434–436; Oosterbroek, 2023.

DESCRIPTION. *Male. General.* Body coloration grayish dark brown with bicolorous Abdomen. Male wing length 6.9–9.0 mm. **Head.** Dark brown, sparsely dusted with yellowish gray, more densely frontally and along eye margin. Male antenna 1.2–1.4 mm long, nearly reaching wing base if bent backwards. Scape brown, sparsely dusted with yellowish gray, elongate, nearly cylindrical, approximately twice as long as pedicel. Second antennomere subglobular, darker brown, sparsely dusted with yellowish gray. Flagellum brown. Four basal flagellomeres oval, covered with short pale pubescence ventrally, remaining segments elongate, three basal segments distinctly widened ventrally. Longest verticils 1.4 times as long as respective flagellomeres. Apical flagellomere large, 1.3 times as long as preceding segment. Rostrum brown. Palpus dark brown. **Thorax.** Pronotum grayish brown, postpronotum light, yellowish brown. Prescutum and presutural scutum yellowish-brownish gray with four distinct dark brown longitudinal stripes. Medial stripe starting at the level of pseudosutural fovea, widening posteriorly and reaching suture. Both stripes separated by brownish gray area, wider frontally, narrower posteriorly. Indistinct short darker line starts at the frontal margin of sclerite. Lateral stripe reduced to a short spot, far not reaching posterior margin of sclerite. Lateral margin of sclerite narrowly darkened. Pseudosutural fovea distinct, black, oblique in dorsal view. Scutal lobe brownish gray, darker posteriorly, ochreous laterally. Area between lobes grayish yellow with brown spot posteriorly. Spot extends onto scutellum making short stripe. Scutellum brown, densely dusted with yellowish gray, pale along posterior margin. Mediotergite light yellowish gray with indistinct darker brown medial line. Pleuron dark brown, dusted with gray. Wing brownish, subhyaline, yellowish at base and along costal margin, patterned with six or seven dark brown spots along frontal margin, spot at humeral vein small, not reaching beyond subcostal vein. Spots distinctly narrower than interspaces. Stigma not darker than surrounding spot. Indistinct grayish brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins. Small spots surround vein tips at posterior wing margin. Veins grayish brown, yellowish at wing base and costal area. Venation typical for the genus: radial sector angulate at base, *m-cu* at about one-third of discal cell's length. Cell *m*₁ long, 1.2 times as long as its stem. Anal vein slightly sinuous, just slightly arched at tip. It reaches wing margin slightly beyond level of supernumerary cross-vein in cell *bm*, base of radial sector distinctly before supernumerary cross-vein. Distal wing cells with macrotrichiae. Male wing narrow, not widened at posterior margin, widest at tip of vein *CuP*. Halter 1.1 mm long with pale yellow stem and brown base, knob dark brown distally, pale basally. Coxae and trochanters brown. Femur brown, paler at base, darker towards distal end, with wide dark brown or black apical ring. Tibia and two basal tarsomeres brown with narrowly and indistinctly darkened apices. Remaining tarsomeres dark brown. Claw black. Male femur III: 6.6 mm long, tibia III: 6.7 mm, tarsus III: 4.6 mm. **Abdomen.** Basal segment dark brown with grayish frontal and posterior margins. Remaining segments, except genital and pregenital, yellowish brown with dark brown posterior and lateral margins. Pregenital segment dark brown. Male genitalia with dark brown ninth segment and brown gonocoxites. Posterior margin of epandrium widely concave, blackened. Gonocoxite elongate, 2.3 times as long as widest part at base, slightly arched, narrows apically, with small 5-dentate plate at base of ventro-mesal surface. Outer gonostylus elongate,



nearly parallel-sided in dorsal view, outer margin with distinct crest, but because it is at right angle to the whole gonostylus, it is hardly visible in dorsal view. Apex of gonostylus with large claw-shaped spine, serrate on outer margin. Inner margin of gonostylus extended into subapical emargination, rounded in some specimens, right-angled in other. Subapical emargination large, rounded, margin finely serrate. Inner gonostylus fleshy and setose, narrower at tip, pale with about two-thirds of inner margin dark brown. Paramere with long plate-shaped mesal lobe lacking any setae, lateral lobe very short, narrow and black. Aedeagus straight and very long in dorsal view, extending far beyond apex of mesal process of paramere. Lateral projection of lower shelf extends to about same level as median projection. Lateral margin of lower shelf smooth. Lateral apodeme elongate, slightly curved at middle. Sperm pump (vesica) elongate, oval. The apodeme of vesica directed anteriorly, large and fan-shaped. Original description mentions that sometimes it has median excision on posterior (actually anterior – SP) margin. Incision is also shown in Fig. 19 (Starý, 2009a). *Female*. unknown.

ELEVATION. No data.

FLIGHT PERIOD. Very end of May and beginning of June.

HABITAT. Valleys.

GENERAL DISTRIBUTION. Southern Italy.

EXAMINED MATERIAL. Paratype, one male (pinned), Italy, Calabria, Cs: S. Maria del Cedro, Lao valley, June 1, 1996, Martinovský (NRC).

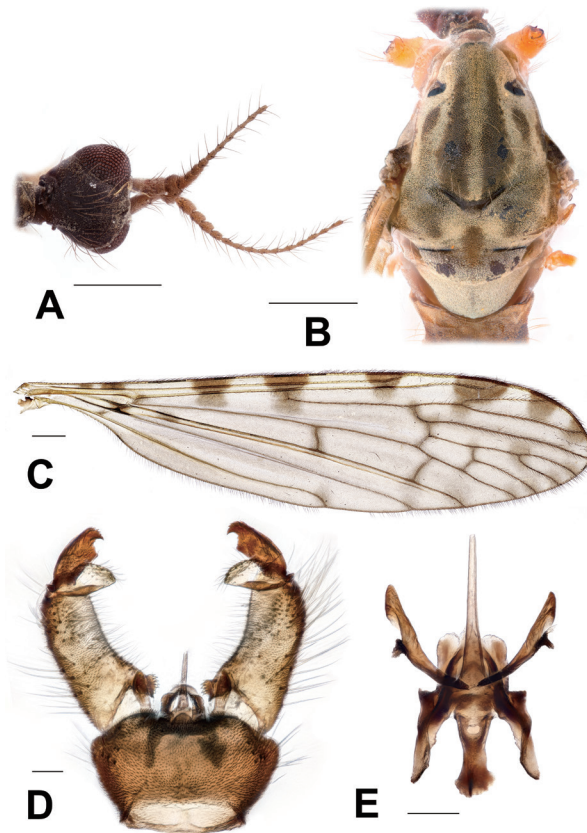


Fig. 51. *Eloeophila martinovskyi* Starý, 2009a, male, paratype. **A.** Head with antennae, dorsal view; **B.** Thorax, dorsal view; **C.** Wing; **D.** genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A–C = 0.5 mm; D, E = 0.1 mm.

46. *Eloeophila miliaria* (Egger, 1863) (Fig. 52, Pl. 8F)

Ephelia miliaria Egger, 1863: 1106; Meijere, 1921: 61; Pierre, 1924b: 118; Czižek, 1931: 121, 124–125; Lackschewitz, 1940: 73;

Limnophila (*Eloeophila*) *miliaria* Mannheims, 1967: 467;

Eloeophila (*Eloeophila*) *miliaria* Ujvarosi, 2007: 230;

Eloeophila miliaria Savchenko, 1986: 310–311; Simova-Tosic, 1992: 141; Starý, Oosterbroek, 1996: 55; Starý, Geiger, 1998: 74; Pakalniskis et al., 2000: 6; 2006: 19; Podenas, Pakalniskis, 2000: 22; Reusch, Bellstedt, 2000: 155, 260; 2001a: 72; Reusch, Oosterbroek, 2000: 155; Oosterbroek, Simova-Tosic, 2004: 445; Starý, 2004; 2009a: 427; 2009b: 24; Koç et al., 2005: 616; 2016: 196; Ujvarosi, 2005: 245; 2007: 230; Podenas et al., 2006: plate 47; Kramer, 2007: 1; Wiedenska, 2007: 75; 2015: 52; 2017: 13; Ozgul et al. 2009: 63; Kolesar et al., 2015: 30; Lantsov, 2015: 366; 2016: 168; Stuke, 2019: 142; Hubenov, 2021: 30; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration brownish yellow, abdomen bicolorous. Male body length 5.2–6.5 mm, female 6.5–7.5 mm, male wing length 6.2–7.5 mm, female 7.5–8.0 mm. **Head.** Gray, vertex brownish. Male antenna reaching slightly beyond frontal margin of prescutum if bent backwards. Both basal antennomeres dark brown, flagellum yellow basally, turning darker towards apex. Rostrum brownish yellow. Palpus brown. **Thorax.** Pronotum brown, dusted with yellowish, postpronotum paler. Prescutum and presutural scutum yellowish brown with indistinct darker brown longitudinal stripes. Interspaces missing, stripes reaching each other, thus whole dorsal surface behind fovea brown to darker brown, dusted with grayish yellow. Scutal lobe brown to darker brown, area between lobes ochreous to brownish yellow. Scutellum brownish yellow, slightly darker frontally. Mediotergite light, pale yellowish-brownish gray, indistinctly darkened posteriorly. Pleuron brown, sparsely dusted with gray. Wing from totally translucent to grayish, yellowish at base and along costal margin, patterned with seven dark brown spots along frontal margin. Spots distinctly narrower than interspaces. Stigma not darker than surrounding spot. Narrow grayish brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins. Small spots surround vein tips at posterior wing margin. Veins brownish yellow, yellow at wing base and in costal area, darker in darkened areas. Venation typical for the genus: radial sector arcuate at base, sometimes with short spur, *m-cu* slightly before middle of discal cell. Cell *m₁* long, approximately as long as its stem. Anal vein slightly arched distally, with short subapical spur. It reaches wing margin beyond level of supernumerary cross-vein in cell *bm*, base of radial sector before supernumerary cross-vein. Distal wing cells without macrotrichiae. Male wing slightly widened at posterior margin, widest at tip of anal vein. Halter pale yellow with dark brown knob. Coxae brown. Fore and middle trochanters brown, hind pair yellow. Femur yellow with pale base and brownish apical ring, sometimes without distal darkening. Tibia and two basal tarsomeres yellow with narrowly and indistinctly darkened apices. Remaining tarsomeres brown. Claw dark brown. Male femur I: 4.3–4.5 mm long, II: 4.4 mm, III: 4.7–5.1 mm, tibia I: 4.9 mm, II: 4.2 mm, III: 4.8–4.9 mm, tarsus II: 3.7 mm, III: 3.3–3.6 mm. **Abdomen.** Basal segment brown with narrowly grayish frontal and posterior margins. Remaining segments, except genital and pregenital, light yellow with widely dark brown posterior margin. Pregenital segment dark brown with yellowish base. Male genitalia rusty brown. Posterior margin of epandrium with narrow and shallow concavity at middle, covered with short



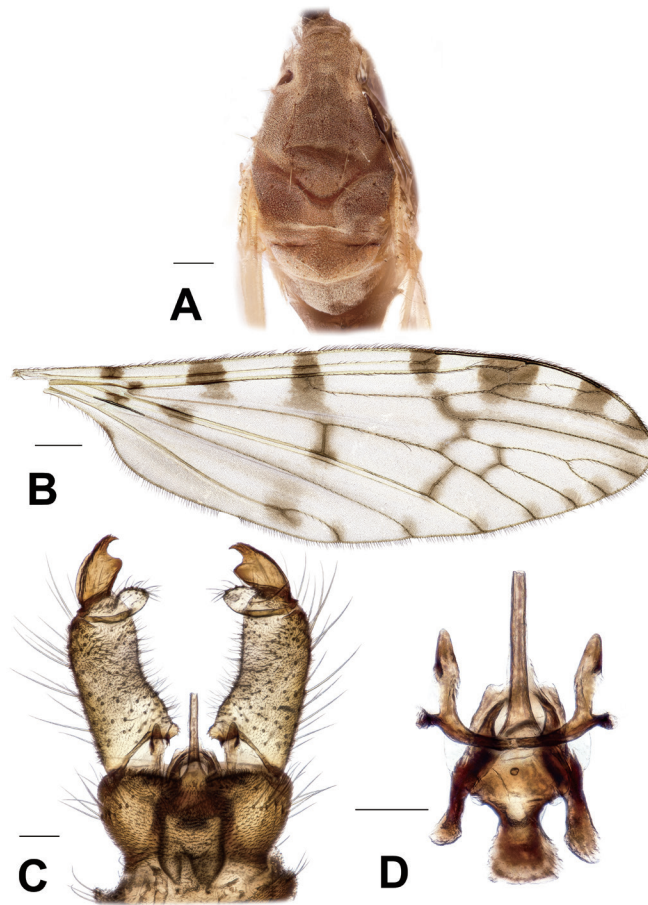


Fig. 52. *Eloeophila miliaria* (Egger, 1863), male. **A.** Thorax, dorsal view; **B.** Wing; **C.** Genitalia, dorsal view; **D.** Aedeagal complex, dorsal view. Scale bars: A = 0.2 mm; B = 0.5 mm; C, D = 0.1 mm.

dense blackish setae. Gonocoxite elongate, slightly more than twice as long as widest part at base, slightly arched, with small 5-dentate plate at base of ventro-mesal surface. Outer gonostylus wide with large apical claw-shaped spine, outer margin of which finely serrate. Crest on outer margin low, without spine-shaped extension. Inner margin of gonostylus extended into rounded subapical emargination. Inner gonostylus wide, fleshy and setose with rounded tip, inner margin darkened along two-thirds. Paramere with long plate-shaped round-apexed mesal lobe lacking any setae, lateral lobe short, black, peg-shaped. Aedeagus straight and very long in dorsal view, extending far beyond apex of mesal process of paramere. Lateral projection of lower shelf slightly raised, blunt, median projection extends along aedeagus. Lateral margin of lower shelf smooth, slightly arched. Lateral apodeme narrow at middle, widened distally, not reaching anterior margin of vesical apodeme. Sperm pump (vesica) widened laterally. Apodeme of vesica directed anteriorly, large, fan-shaped.

ELEVATION. From about 100 m to slightly above 1800 m.

FLIGHT PERIOD. From beginning of June through to beginning of August.



HABITAT. Margins of streams and springs covered by mixed and deciduous forests. Species is attracted to light.

GENERAL DISTRIBUTION. Albania, Austria, Bulgaria, Croatia, Czech Republic, France, Germany, Hungary, Italy, Lithuania, Poland, Romania, Serbia, Slovakia, Switzerland, Turkey, Ukraine, North Caucasus (Russia).

EXAMINED MATERIAL. One male (pinned), Bulgaria, Hills S of Petrich, altitude 610–914 m (2000–3000 ft), August 7, 1935, P.A. Buxton, Pres. By Imp. Inst. Ent. B.M. 1935-500 (NHMUK); two males (pinned), Czechoslovakia, Mor., near Olomouc, Jivova, June 17, 1973, S.J. Chambers & A.M. Hutson, B.M. 1973–373 (NHMUK); one male (in ethanol), Switzerland, Tichino, Genestrerio, June 25 – July 1, 1979, C. Dufour, W. Geiger, Malaise – light trap (MHNN); 1 female (in ethanol), Lithuania, Kaunas district, Dubrava, N 54.51000°, E 024.06000°, June 8–15, 1997, G. Margis, light trap (VU); 2 males (in ethanol), Lithuania, Plunge district, Ploksciai, N 56.00390°, E 021.53312°, June 1–8, 1998, G. Margis, light trap (VU); 1 male (in ethanol), Lithuania, Plunge district, Ploksciai, N 56.00390°, E 021.53312°, June 15–22, 1998, G. Margis, light trap (VU); 1 male (in ethanol), Lithuania, Mazeikiai distr., Renavas, N 56.12315°, E 022.04207°, altitude 116 m, June 7–13, 2004, A. Vilkas, S. Podenas, light trap (ANSP); 1 female (in ethanol), Lithuania, Vilnius district, Verkiai Regional Park, June 10, 2008, V. Buivydaite (VU).

47. *Eloeophila minor* Starý, 2009a (Fig. 53, Pl. 9A)

Eloeophila minor Starý, 2009a: 427, 435–436; Kolcsar et al., 2021: 92; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration dark brown dusted with gray. Male body length 4.1 mm, wing length 5.3–7.2 mm. **Head.** Dark brown, sparsely dusted with gray, narrowly light gray along eye margin. Male antenna 0.9–1.2 mm long, reaching to about middle of prescutum if bent backwards. Both basal segments brown, sparsely dusted with yellowish gray. Scape elongate, subcylindrical, nearly twice as long as pedicel, bearing few long setae dorsally. Pedicel subglobular. Flagellum yellow, slightly infuscate distally. Four basal flagellomeres oval, distinctly widened ventrally and covered with short pale pubescence, remaining segments elongate. Apical flagellomere large, slightly exceeding preceding segment in length. Longest verticils 1.6 times as long as respective flagellomeres. Rostrum and palpus dark brown. **Thorax.** Pronotum brown. Prescutum and presutural scutum yellowish-brownish gray with distinct dark brown pattern. Median stripe starting at the frontal margin of sclerite, anterior half distinctly dark brown, posterior half indistinct, grayish. Both stripes separated by narrow yellowish area. Lateral stripe reduced to an oval oblique spot, far not reaching posterior margin of sclerite. Interspace with 2–3 dots anteriorly, complete narrow stripe reaching suture posteriorly. Lateral margin of sclerite darkened, occasionally this darkening fused with lateral stripe. Pseudosutural fovea distinct, dark brown, oblique in dorsal view. Scutal lobe brown, densely covered with gray pruinosity, small dark brown spot postero-medially. Area between lobes pale brownish gray with small dark brown spot at posterior margin. Spot extends onto frontal margin of scutellum. Posterior margin of scutellum light gray. Mediotergite light gray with darker lateral margin. Pleuron grayish brown with two narrow longitudinal stripes. Wing brownish, subhyaline, yellowish at base and along costal margin, patterned with six or seven dark brown spots



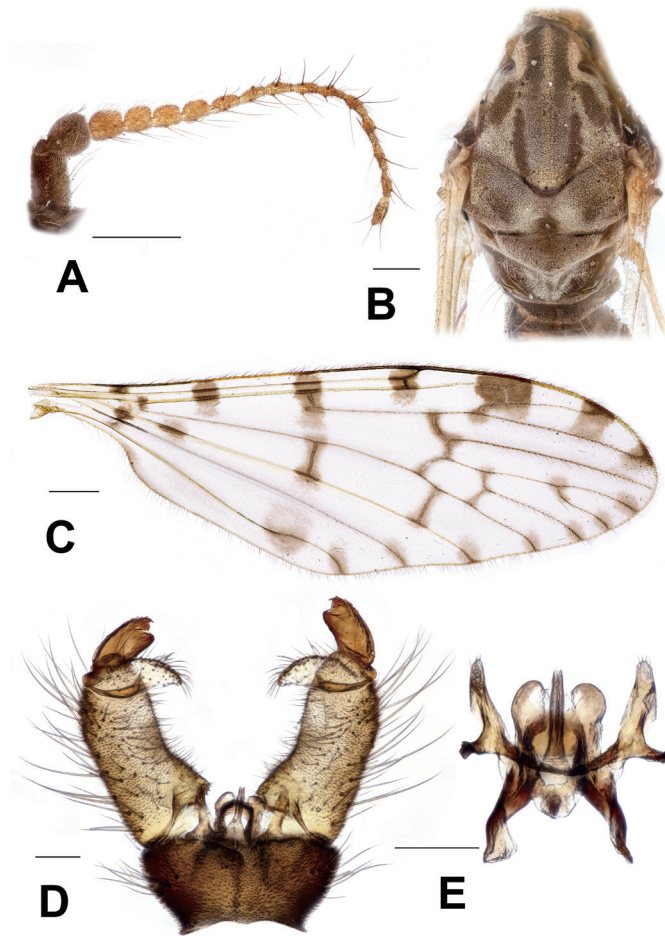
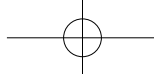


Fig. 53. *Eloeophila minor* Starý, 2009a, male, paratype. **A.** Antenna; **B.** Thorax, dorsal view; **C.** Wing; **D.** Genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A, B = 0.2 mm; C = 0.5 mm; D, E = 0.1 mm.

along frontal margin, spot at humeral vein small, not extending beyond subcostal vein. Spots small, distinctly narrower than interspaces. Stigma slightly darker than surrounding spot. Narrow brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins. Small spots surround vein tips at posterior wing margin. Veins brownish yellow, distinctly yellow at wing base and costal area, brown in darkened areas. Venation typical for the genus: radial sector angulate and short-spurred at base, *m-cu* slightly before middle of discal cell. Cell *m*₁ long, 1.1 times as long as its stem. Anal vein nearly straight at basal half, slightly arched distally. It reaches wing margin distinctly beyond level of supernumerary cross-vein in cell *bm*, base of radial sector nearly at the same level as supernumerary cross-vein. Distal wing cells with macrotrichiae. Male wing distinctly widened at posterior margin, widest at tip of anal vein. Male halter 1.1–1.2 mm long with light brown stem, darker at base, knob dark brown. Coxae and trochanters rusty brown, hind trochanter yellowish. Femur yellow, slightly infuscate distally, without darker apical ring. Tibia and two basal tarsomeres yellow, remaining tarsomeres brown. Claw dark brown. Male femur I: 4.0 mm long, II:





3.9–4.4 mm, III: 4.0 mm, tibia I: 4.3 mm, II: 3.1–4.0 mm, III: 3.5 mm, tarsus I: 3.9 mm, II: 3.0–3.8 mm, III: 3.0 mm. **Abdomen.** Dark brown, segments two to seven narrowly paler at base. Basal and pregenital segments dark brown. Male genitalia brown. Posterior margin of epandrium nearly straight with small concavity at middle, finely setose. Gonocoxite twice as long as widest part at base, slightly arched, narrows apically, with three small teeth at base of ventro-mesal surface. Outer gonostylus elongate, nearly parallel-sided in dorsal view, outer margin serrate distally, with distinct crest, but because it is at right angle to the whole gonostylus, it is hardly visible in dorsal view. Apex of gonostylus with small spine, inner margin moderately extended into subapical rounded angle. Subapical emargination shallow. Inner gonostylus fleshy and setose, widest at middle, narrower at tip, pale, with about half of inner margin darker brown. Paramere with long plate-shaped mesal lobe finely setose at apex, lateral lobe short, narrow, blackened distally. Aedeagus straight but short in dorsal view, bifid at apex, far not reaching posterior margin of paramere. Lateral projection of lower shelf wide with rounded posterior margin. Lateral margin of lower shelf nearly straight. Lateral apodeme elongate, slightly curved. Sperm pump (vesica) subglobular. Apodeme of vesica small, directed ventrally, visible as small dark spot in dorsal view.

ELEVATION. No data.

FLIGHT PERIOD. Whole of June through to middle of July.

HABITAT. Valleys along margins of streams, brooks. Adults are attracted to light.

GENERAL DISTRIBUTION. Bulgaria, Czech Republic, Greece, Hungary, Slovakia, North Caucasus (Russia).

EXAMINED MATERIAL. Paratype, one male (pinned, wing slide-mounted), Slovakia, Stakčín, Chotinka valley, June 24, 1983, J. Starý (Naturalis, RMNH.INS 1543983); paratype, one male (pinned), Slovakia, Stakčín, Chotinka valley, June 3, 1984, J. Starý (NRC).

48. *Eloeophila modoc* (Alexander, 1946) (Fig. 54, Pl. 9B)

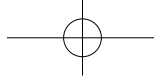
Limnophila (*Elaeophila*) *modoc* Alexander, 1946c: 95–97;

Limnophila (*Eloeophila*) *modoc* Alexander, 1967: 107, 111;

Eloeophila modoc Oosterbroek, 2023.

DESCRIPTION. General. Body coloration dark brown dusted with gray. Male body length 6.0–6.5 mm, female 7.0 mm, wing length of male 7.0–8.9 mm, female 7.5 mm. **Head.** Dark brownish gray. Male antenna 1.3–1.5 mm long, reaching to about middle of prescutum if bent backwards. Scape elongate, dark brown. Pedicel subglobular, brown to dark brown. Basal flagellomere pale brown, remaining segments brown. Few basal flagellomeres oval, remaining segments elongate. Flagellomeres I–IV distinctly swollen and covered with dense grayish pruinosity on ventral side. Apical flagellomere large. Longest verticils up to 1.5 times as long as respective flagellomeres. Rostrum and palpus dark brown. **Thorax.** Pronotum brownish gray. Prescutum and presutural scutum dark brown, densely covered with gray pruinosity. Four longitudinal stripes scarcely defined, dark gray. Pseudosutural fovea distinct, black. Scutal lobe dark brown, densely covered with gray pruinosity, area between lobes paler brown. Scutellum somewhat paler brown frontally, dark brown, dusted with gray posteriorly. Mediotergite dark brown, densely dusted with light gray anteriorly,





less so posteriorly. Pleuron dark brown, densely covered with dark gray pruinosity. Dorsopleural membrane brownish yellow. Wing brownish, subhyaline, yellowish at base, patterned with seven dark brown spots along frontal margin. Spots small, distinctly narrower than interspaces. Stigma not darker than surrounding spot. Brownish areas surround cord, distal margin of discal cell, cross-veins and branching points of veins. Diffuse spots surround vein tips at posterior wing margin. Veins pale brown, yellowish at wing base and along costal area, dark brown in darkened areas. Venation typical for the genus: radial sector angulate and short-spurred at base, *m-cu* slightly before middle of discal cell. Cell m_1 long, 1.25 times as long as its stem. Anal vein slightly sinuous. It reaches wing margin distinctly before level of supernumerary cross-vein in cell *bm*, but slightly beyond base of radial sector. Distal wing cells without macrotrichiae. Male wing not widened at posterior margin, evenly rounded. Halter 0.9–1.3 mm long, pale yellow. Coxae and trochanters yellow, fore coxa slightly infuscate frontally. Femur brownish yellow with dark brown apical ring. Rings on all femora subequal. Tibia and basal tarsomere brownish yellow with tip scarcely darkened. Remaining tarsomeres brown to dark brown. Male femur I: 5.0–5.4 mm long, II: 5.5–5.9 mm, III: 5.8 mm, tibia I: 4.8–5.5 mm, II: 4.7–5.6 mm, III: 5.6 mm, tarsus I: 3.7–4.3 mm, II: 3.7–4.1 mm, III: 3.9 mm. Claw dark brown. **Abdomen.** Two basal tergites dark brown with narrowly gray posterior margin. Tergites three to seven yellowish brown, widely dark brown along posterior margin. Sternites obscure yellow, narrowly dark brown along posterior and lateral margins. Pregenital segment dark brown. Male genitalia reddish brown. Posterior margin of epandrium shallowly concave, finely setose. Gonocoxite 1.8 times as long as widest part, with low wide lobe ventro-mesally at base. Outer gonostylus elongate, widest at middle, outer margin serrate distally, apex with spine. Outer margin with evenly widened crest, inner margin with small bumps but without distal extension. Inner gonostylus fleshy and setose, pale with narrowly darkened inner margin. Paramere with long wide round-apexed plate-shaped, bare at apex mesal lobe, lateral lobe short, narrow, blackened distally. Aedeagus nearly straight but short in dorsal view, bifid at apex, reaching to about posterior margin of paramere. Lateral projection of lower shelf angulate, mesal extension reaches tip of aedeagus. Lateral margin of lower shelf nearly straight. Lateral apodeme long and narrow, peg-shaped in dorsal view. Sperm pump (vesica) subglobular. Apodeme of vesica not visible in dorsal view.

ELEVATION. From slightly above 1500 m to slightly more than 3100 m.

FLIGHT PERIOD. From late June to middle of August.

HABITAT. Mountainous streams, small streams with some marshy areas alongside, surrounded by low grass (*Juncus*, *Ranunculus*, *Carsilleja* and other wildflowers), pine trees further up the slopes.

GENERAL DISTRIBUTION. USA (California and Utah).

EXAMINED MATERIAL. Holotype, male (antenna, legs, wing and genitalia slide-mounted), USA, California, Modoc Co., Davis Creek, altitude 1524 m (5000 ft), [July 11, 1922], A.W. Lindsey (USNM); two males (pinned), USA, California, Lassen County, Susanville, July 23, 1911 (ANSP); one male and one specimen with unclear sex (pinned, male genitalia in microvial with glycerol on same pin), USA, Utah, Beaver, altitude 2438 m (8000 ft), June 26, 1942, C.P. Alexander (ANSP); one male (pinned), USA, California, Prairie Creek S Park, August 10, 1948, Fender (USNM); six males, one female (pinned, genitalia of one male in microvial with glycerol on same pin), USA, California, Prairie Creek, August 11, 1948, C.P. Alexander (USNM); one male, two females, one specimen of unclear sex (pinned, male genitalia in microvial with glycerol on same pin), USA, California, Tehama Co., Mill Creek at Route 36, August 18, 1950, C.P. Alexander (USNM); one



male (pinned, genitalia in microvial with glycerol on same pin), USA, California, Yosemite, Tamarack Flat, altitude 1925 m (6315 ft), July 24, 1957, C.P. Alexander (USNM); one male (pinned), USA, Utah, Wasatch Co., 31 km NE Kamas, Uinta Mountains, altitude 3109 m, August 1–2, 1986, J. Gelhaus #420, A. Roig (ANSP); one male (pinned), USA, California, Calaveras Co., Camp. Connell (at store) on Hwy #4, San Antonio Ck., altitude 1791 m, N 38°18'35", W 120°16'33", July 15, 2000, A. Short, J. Gelhaus #841 (ANSP).

REMARK. Differs from *E. apiculata* by light knob of halter.

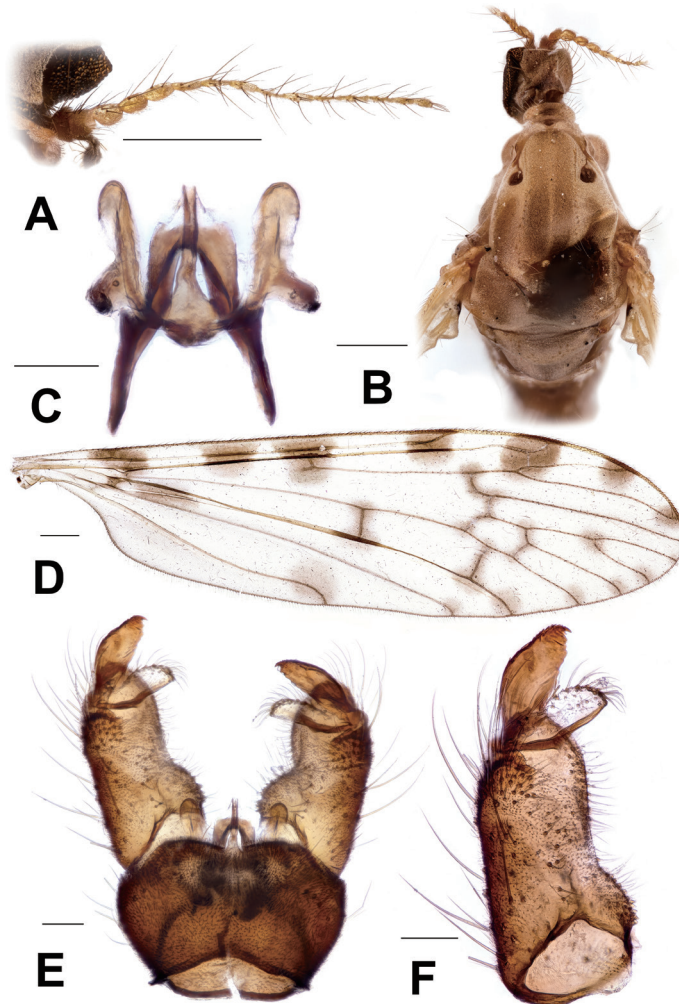
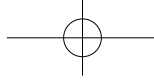


Fig. 54. *Eloeophila modoc* (Alexander, 1946), male. **A.** Antenna; **B.** Thorax, dorsal view; **C.** Aedeagal complex, dorsal view; **D.** Wing; **E.** Genitalia, dorsal view; **F.** Gonocoxite and gonostyles, fronto-dorsal view. Scale bars: A, B, D = 0.5 mm; C, E, F = 0.1 mm.





49. *Eloeophila mundata* (Loew, 1871) – Fringed Linkwing (Fig. 55, Pl. 9C)

Ephelia mundata Loew, 1871: 12; Pierre, 1924b: 118; Czižek, 1931: 122, 125; Lackschewitz, 1940: 73;

Idioptera mundata Edwards, 1921: 221;

Ephelia marmorata var. *mundata* Nielsen, 1925: 70;

Limnophila (*Elaeophila*) *mundata* Edwards, 1938: 79; Coe, 1950: 42;

Limnophila (*Eloeophila*) *mundata* Pokorný, 1978: 137–139; Hewitt et al., 2005: 38;

Eloeophila (*Eloeophila*) *mundata* Ujvarosi, 2007: 230;

Eloeophila mundata Savchenko, 1986: 305, 306, 308, 314; Starý, Oosterbroek, 1996: 55; Starý, Geiger, 1998: 74; Schacht, 1999: 134; 2005: 5; Godfrey, 2000: 22; Reusch, Oosterbroek, 2000: 155; Petersen, Jong, 2001: 149; Oosterbroek, Simova-Tosic, 2004: 445; Starý, 2004; Chaniecka, Wiedenska, 2006: 147; Podenas et al., 2006: plate 48; Wiedenska, 2007: 75; 2014: 12; 2015: 52; 2017: 13; Reusch, Hohmann, 2009: 129; Skidmore, 2009: 128; Starý, 2009b: 24; Podeniene, Gelhaus, 2010: 188; Hewitt, 2014: 13; Salmela, Petrasianas, 2014: 27; Chuzhekova, 2015: 64, 211, 240; 2016: 11, 32; Hubenov, 2015: 220; 2016: 47; 2017: 67; 2021: 30; Mederos, Eiroa, 2015: 266; Boardman, 2016: 130; Brighton, 2017: 27, 36; Olsen et al., 2018: 158, 159, 164; Starý, Vonicka, 2018: 46, 49; Stuke, 2019: 142; Kolcsar et al., 2021: 92–93; Tack et al., 2021: 193, 253; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration dark brown, abdomen bicolorous. Male body length 5.6–7.2 mm, wing length of male 8.6–9.5 mm. **Head.** Dark brown, grayish frontally and along eye margin. Vertex with indistinct darker line fronto-medially. Male antenna 1.3–1.6 mm long, reaching to about middle of prescutum if bent backwards. Scape elongate, dark brown, bearing few long setae dorsally. Pedicel subglobular, brown. Flagellum yellowish brown to light brown, slightly darker at distal end. Five basal flagellomeres oval, remaining segments elongate. Three basal segments strongly dilated ventrally. Apical flagellomere large, 1.3 times as long as preceding segment. Longest verticils up to 2.4 times as long as respective flagellomeres. Rostrum and palpus dark brown. **Thorax.** Pronotum dark brown, sparsely dusted with gray, postpronotum brownish yellow. Prescutum and presutural scutum dark brown, densely covered with ochreous pruinosity. Four longitudinal stripes reduced to small darker spots behind fovea, usually missing completely. Pseudosutural fovea distinct, rounded, black, surrounded by light brown or ochreous brown area. Scutal lobe concolorous with presutural scutum, area between lobes light yellowish gray. Scutellum darker brown with indistinct dark brown medial line and paler posterior margin. Mediotergite light gray. Pleuron dark brown, dusted with gray and with indistinct darker and paler spots. Dorsopleural membrane dark brown. Wing milkish, subhyaline, yellowish at base, patterned with seven dark brown spots along frontal margin. Spots subequal or narrower than interspaces. Stigma dark brown. Narrow dark brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins, vein R_5 bordered by a grey strip of uniform width. Small spots surround vein tips at posterior wing margin, separate rounded spot on anal vein. Small dots in cells and on veins completely missing, posterior cells slightly infuscate with grayish. Veins yellowish, dark brown in darkened areas. Venation typical for the genus: radial sector arcuate at base, $m-cu$ at middle of discal cell. Cell m_1 long, 1.8 times as long as its stem. Anal vein slightly sinuous. It reaches wing



margin distinctly beyond level of supernumerary cross-vein in cell *bm*, base of radial sector far before level of supernumerary cross-vein. Cell *R*₄ with few macrotrichiae before wing margin. Male wing widened posteriorly, widest at tip of anal vein. Male halter 1.1–1.2 mm long, stem pale yellow with brownish base, knob dark brown with pale base. Coxae rusty brown, trochanters brownish yellow. Femur brownish yellow with wide dark brown apical ring. Rings on all femora subequal. Tibia and three basal tarsomeres brownish yellow with narrow darkening at tip. Remaining tarsomeres brown to dark brown. Claw blackish. Male femur I: 4.2–5.9 mm long, II: 5.3 mm, III: 5.1–6.9 mm, tibia I: 5.5–5.8 mm, II: 5.2 mm, III: 5.3–6.0 mm, tarsus I: 5.6–6.1 mm, II: 4.6 mm, III: 3.7–4.8 mm. **Abdomen.** Bicolourous, segments brownish yellow with wide dark brown posterior and lateral margins. Sternites lighter than tergites. Pregenital segment dark brown. Male genitalia with darker brown ninth segment and yellowish brown or light brown gonocoxites. Posterior margin of epandrium with wide shallow evenly rounded emargination at middle, finely setose. Gonocoxite nearly twice as long as widest part at base, slightly arched, with five small teeth at base of ventromesal surface. Outer gonostylus elongate, slightly narrows towards tip in dorsal view, outer margin serrate distally, without prominent crest. Apex of gonostylus with distinct spine, inner margin with low subapical angle. Inner gonostylus fleshy and setose, widest at middle, narrower at tip, pale with darkened frontal margin. Paramere with long and wide plate-shaped mesal lobe finely setose at apex, lateral lobe short and narrow, blackened distally. Aedeagus straight and short in dorsal view, bifid at apex, reaching to about posterior margin of paramere. Lateral projection of lower shelf wide, evenly rounded. Lateral margin of lower shelf nearly straight. Lateral apodeme long and narrow, slightly curved, blackened at middle, pale apically. Sperm pump (vesica) subglobular. Apodeme of vesica small and narrow, dark brown, directed frontally.

ELEVATION. From about 100 m to nearly 2400 m (Hubenov, 2017).

FLIGHT PERIOD. From beginning of May to end of September.

HABITAT. Upland areas, also occurs by wooded streams often quite large ones. Has been reported to swarm over stream banks at sunset (Coulson, 1959), at least some localities are on limestone (Stubbs, 2021). The species occurs mostly at small running waters, e.g. springs, brooks and streams. Has been recorded as developing in substrate at the margins of these running waters (Przhiboro, 2017).

GENERAL DISTRIBUTION. Most European countries: Austria, Belgium, Bosnia-Herzegovina, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Ireland, Italy, Lithuania, North Macedonia, Norway, Poland, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine. Also Eastern Siberia (Russia).

EXAMINED MATERIAL. One female (pinned), Switzerland, Vallais, Binn, July 1952, F. Schmid (MCSN-VD); two males (pinned), Spain, Lerida, Pont de Pollers, altitude 1680 m, July 7, 1973, P.S. Cranston, B.M. 1973–345 (NHMUK); two males (pinned), Spain, Huesca, Gargantas, July 2, 1975, A.E. Stubbs, B.M. 1975–389 (NHMUK); one male (pinned), Switzerland, Luzern, Sörenberg, Hallenbad, altitude 1160 m, July 7, 1977, LF, L. Rezbanyai (MHNN); one female (in ethanol), Switzerland, Zürich, Wald, June 10–11, 1979, W. Geiger (MHNN); two males (in ethanol), Switzerland, TI, Alpe di Manio v. Betules, June 17, 1979, W. Geiger (MHNN); two males (in ethanol), Switzerland, Graubünden, St. Gallen-Ost, altitude 590 m, June 30 – July 6, 1980, R. Müller, Schaugenbädli Lichtfalle (MHNN); one male (in ethanol), Switzerland, Graubünden, Terasp, July 1, 1980, W. Geiger (MHNN); one male, one female (in ethanol), Switzerland, Graubünden, Il Fuorn,



Parc National, July 7–8, 1980, C. Dufour (MHNN); one male (in ethanol), Switzerland, Graubünden, Il Fuorn, July 7 – August 11, 1980, W. Geiger (MHNN); one male (in ethanol), Switzerland, Valais, Napoleon Brücke, Simplon, August 12, 1980, W. Geiger (MHNN); one male (pinned), France-Gard, Dourbies (Les Laupies), Le Pradinas, 1040 m, July 7, 1990, J.P. Haenni (MHNN); one male (in ethanol), Switzerland, PNS, Source Clemgia Castai has Pins auchut, July 16, 1993, W. Geiger (MHNN); one male (pinned), Lithuania, Elektrenai district, N54.77837°, E024.92232°, July 6, 2012, S. Podenas (NRC).

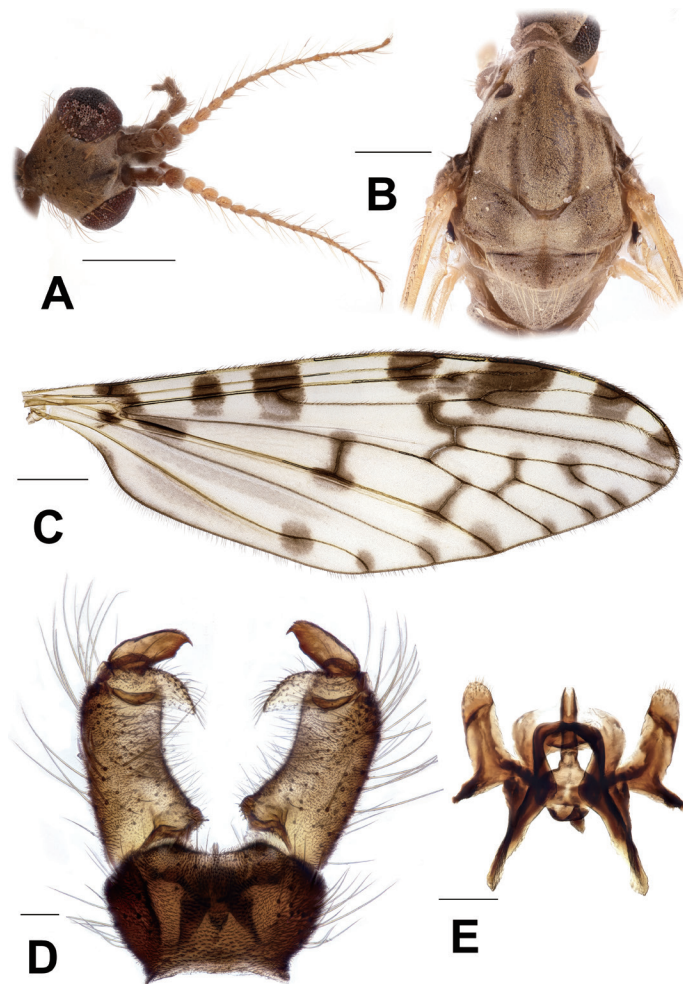
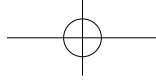


Fig. 55. *Eloeophila mundata* (Loew, 1871), male. **A.** Head, dorsal view; **B.** Thorax, dorsal view; **C.** Wing; **D.** Genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A, B = 0.5 mm; C = 1.0 mm; D, E = 0.1 mm.





50. *Eloeophila nupta* (Alexander, 1947) (Fig. 56)

Limnophila (*Elaeophila*) *nupta* Alexander, 1947: 207–208;

Limnophila (*Eloeophila*) *nupta* Alexander, 1967: 107, 111;

Eloeophila nupta Oosterbroek, 2023.

DESCRIPTION. General. Body coloration gray with bicolorous Abdomen. Male body length 6.5 mm, wing length 6.9–7.4 mm. **Head.** Gray. Both basal antennomeres black, scape covered with pruinosity, flagellar segments paler. Male antenna reaching to about middle of prescutum if bent backwards. Longest verticils exceeding length of respective flagellomeres. Rostrum and palpus brownish black. **Thorax.** Pronotum gray. Prescutum and presutural scutum light gray with four dark brown longitudinal stripes that are separated by narrow gray lines. Pseudosutural fovea conspicuous, black. Scutal lobe gray, weakly patterned with dark brown. Scutellum and mediotergite gray. Pleuron gray. Wing yellowish, more intensely at base and in costal area, patterned with six larger dark brown spots along frontal margin. Narrow dark brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins, small spots at vein tips along posterior wing margin. Small dots in cells and on veins missing. Veins brown, darker brown in darkened areas. Venation typical for the genus: radial sector angulate and long spurred at base, *m-cu* at about one third of discal cell's length. Cell m_1 subequal to its petiole. Male wing not widened, posterior margin evenly rounded. Halter with pale stem and dark brown knob. Coxae and trochanters yellow. Femora yellow at basal half. **Abdomen.** Bicolorous, segments brownish yellow with wide dark brown posterior and lateral margins. Paler coloration more distinct on the more proximal segments. Gonocoxite of male genitalia about twice as long as wide in slide-mounted specimen, apex produced into low blackened obtuse lobe bearing tuft of long setae that approximately equal in length to the outer gonostylus. Outer gonostylus black, long and narrow, with distinct curved apical spine, outer margin serrate distally. Crest on outer margin prominent, armed with strong apical spine at about two thirds of gonostylus length. Inner margin of gonostylus with small but distinct subapical angle. Inner gonostylus fleshy, setose, oval-shaped and pale. Paramere with elongate but comparatively short, wide and round-apexed mesal lobe, lateral lobe similar in size and shape to mesal lobe. Aedeagus straight and long in dorsal view, extending far beyond distal margin of paramere. Lateral projection of lower shelf extended into strong blackened spine reaching far beyond distal margin of paramere, to about middle of aedeagus. Lateral margin of lower shelf evenly rounded. Lateral apodeme long and narrow, slightly curved distally. Sperm pump (vesica) subglobular. Apodeme of vesica small and rounded, directed ventrally and visible as dark spot in dorsal view.

ELEVATION. Close to 2200 m.

FLIGHT PERIOD. Late July.

HABITAT. Margins of creeks.

GENERAL DISTRIBUTION. USA (California).

EXAMINED MATERIAL. Holotype, male (wing and genitalia slide-mounted), USA, California, Yosemite National Park, Bridalveil Creek, altitude 2156 m (7075 ft), July 22, 1946, C.P. Alexander (USNM).



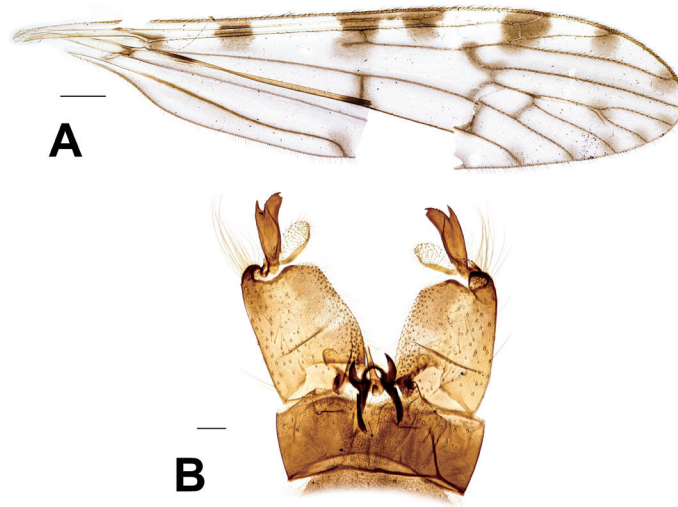
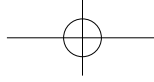


Fig. 56. *Eloephila nupta* (Alexander, 1947), male, holotype. **A.** Wing; **B.** Genitalia, dorsal view; Scale bars: A = 0.5 mm; B = 0.1 mm.

51. *Eloephila ornata* (Brunetti, 1912) (after Brunetti, 1912) (Fig. 57)

Ephelia ornata Brunetti, 1912: 527–528;

Limnophila (Eloephila) ornata Mitra, Bhattacharya, 2010: 363; Banerjee et al., 2018: 739;

Eloephila ornata Oosterbroek, 2023.

DESCRIPTION. General. Body coloration brownish yellow. Female body length 9.0 mm. **Head.** Vertex bright yellowish brown frontally, blackish gray posteriorly, with dark median line and covered with pale setae. Antenna dark brown with exception of pale yellowish white basal flagellomere. Verticils long. Rostrum and palpus brownish yellow. **Thorax.** Prescutum and presutural scutum brownish yellow with four short dark brown longitudinal stripes in front of the suture, medial stripes oval, lateral subcircular, lateral margin of sclerite in front of the root of the wing dark brown, triangular spot at the middle of frontal margin of sclerite. Pseudosutural fovea distinct, dark brown. Scutal lobe with indistinct brownish spot. Scutellum brownish. Mediotergite brownish yellow. Pleuron dark brown, unevenly dusted with gray. Female wing grayish, intensely patterned with dark gray or brownish gray spots, largest at wing base, at base and at branching point of radial sector, at tip of R_1 , smaller spots at tips of longitudinal veins and in anal cell, small dots distributed through the whole wing surface. Venation typical for the genus: radial sector angulate and short-spurred at base, $m-cu$ slightly beyond base of discal cell. Cell m_1 long, 1.5 times as long as its stem. Anal vein gently sinuous. Female halter blackish. Coxae brown with darker marks on ventral side. Femur brownish yellow with very faint indication of a subapical brownish ring. Tibia and basal tarsomeres brownish yellow. **Abdomen.** Dark brownish yellow with black lateral stripe which is interrupted by



whitish spot on each segment. Tergites and sternites covered with very short pubescence. Ovipositor yellowish.

ELEVATION. Unknown.

FLIGHT PERIOD. Late June.

HABITAT. Unknown.

GENERAL DISTRIBUTION. India (Uttarakhand).

EXAMINED MATERIAL. (?) One male (fragment of wing, legs and genitalia slide-mounted), India, W. Himalayas, Kasauli, February 1914, Maj. Christophers (USNM).

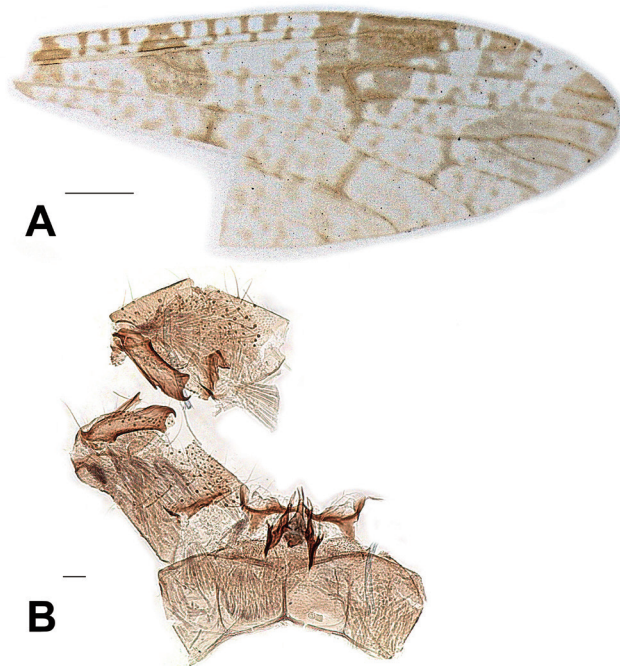


Fig. 57. *Eloephila ?ornata* (Brunetti, 1912), male. **A.** Fragment of wing; **B.** Genitalia, dorsal view. Scale bars: A = 0.5 mm; B = 0.1 mm.

52. *Eloephila oxyacantha* (Alexander, 1971) (Fig. 58)

Limnophila (*Eloephila*) *oxyacantha* Alexander, 1971: 238–239;

Eloephila oxyacantha Oosterbroek, 2023.

DESCRIPTION. General. Body coloration gray with brownish yellow Abdomen. Male body length 5.5 mm, wing 5.2 mm. **Head.** Grayish brown. Male antenna 1.4 mm long. Both basal antennomeres brownish black. Basal half of proximal flagellomeres brown, distal half obscure yellow, distal flagellomeres uniformly dark brown. Length of longest verticils subequal to length of



respective segments. Rostrum brownish gray. Palpus brownish black. **Thorax.** General coloration gray. Pronotum gray. Prescutum and presutural scutum gray with four dark brown longitudinal stripes and broadly darkened lateral margin. Interspace between medial stripes approximately same width as stripe itself, both stripes nearly reaching each other posteriorly. Pseudosutural fovea distinct, black. Scutal lobe brownish gray with darker brown spot at the middle. Scutellum and mediotergite brownish gray. Pleuron dark brown. Wing milkish, subhyaline, yellowish at base, with very intense dark brown pattern. Frontal wing margin with seven spots subequal or wider than interspaces. Large spots and small dots evenly distributed along veins and in wing cells, cross-veins surrounded by wide dark areas. Stigma dark brown. Veins brown, yellowish at wing base and along costal area. Venation typical for the genus: radial sector arcuate at base, *m-cu* slightly beyond base of discal cell. Cell m_1 long, 1.3 times as long as its stem. Anal vein slightly sinuous. It reaches wing margin approximately at the level of supernumerary cross-vein in cell *bm*, base of radial sector far before level of supernumerary cross-vein. Distal wing cells without macrotrichiae. Male wing narrow, not widened posteriorly, widest at tip of vein *CuP*. Stem of halter yellow, knob dark brown. Coxae dark brown, trochanters brownish yellow. Femur brown with narrowly pale base and dark brown subapical ring, very apex paler. Tibia uniformly brown. Tarsus brownish yellow, with darker last segment. **Abdomen.** Abdominal segments brownish yellow, posterior and lateral margins brown. Pregenital segment dark brown. Male genitalia with wide but short epandrium, posterior margin of which with wide but shallow concavity, lateral margin evenly rounded. Gonocoxite elongate, approximately 1.6 times as long as widest part at base, narrower towards apex. Outer gonostylus elongate, wide at basal half, turning narrow rod-shaped at distal end. Outer margin without serration, crest very low, nearly missing, inner margin with evenly rounded subapical angle and fine serration along distal margin. Inner gonostylus fleshy and setose, slightly arched, narrower at tip, pale with

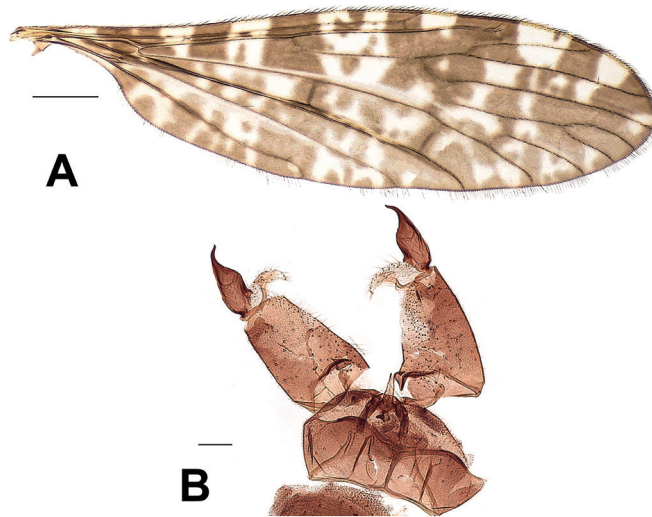


Fig. 58. *Eloeophila oxyacantha* (Alexander, 1971), male, holotype. **A.** Wing; **B.** Genitalia, dorsal view. Scale bars: A = 0.5 mm; B = 0.1 mm.



darkened frontal margin. Paramere with long, arched, plate-shaped mesal lobe that lacks any setae, lateral lobe short. Aedeagus straight in dorsal view, reaching to about posterior margin of paramere. Lateral projection of lower shelf not expressed. Lateral apodeme long and narrow, slightly arched, dark brown. Sperm pump (vesica) subglobular. Apodeme of vesica extended forward, plate-shaped.

ELEVATION. About 400–600 m.

FLIGHT PERIOD. Middle of March.

HABITAT. Unknown.

GENERAL DISTRIBUTION. India (Assam).

EXAMINED MATERIAL. Holotype, male (antenna, legs, wing and abdomen slide-mounted), India, Assam – Kameng, Amatulla, altitude 381–610 m (1250–2000 ft), March 11, 1961, Schmid (USNM).

53. *Eloeophila paraprilinea* (Alexander, 1937) (Fig. 59, Pl. 9D)

Limnophila (*Elaeophila*) *paraprilinea* Alexander, 1937: 75–77;

Eloeophila paraprilinea Oosterbroek, 2023.

DESCRIPTION. General. Body coloration yellowish brown with darker brown to blackish Abdomen. Female body length 8.0 mm, wing 6.6–7.5 mm. **Head.** Brown, indistinctly grayish along eye margin. Vertex covered with long erect setae. Female antenna reaching to about middle of prescutum if bent backwards. Both basal antennomeres brown, flagellum yellow, turning darker towards apex. Basal flagellomeres oval, distal elongate. Longest verticils exceed length of respective segments. Rostrum and palpus dark brown to black. **Thorax.** Pronotum brown. Prescutum and presutural scutum dark brown with three wide yellowish brown longitudinal stripes. Pseudosutural fovea indistinct, light brown, surrounded by darker brown area. Scutal lobe brownish yellow with paler yellow lateral margin. Area between lobes yellow. Scutellum brownish with paler yellow posterior margin. Mediotergite obscure yellow with indistinct darker medial stripe. Pleuron dark brown, katepisternum paler brown ventrally. The dorsopleural membrane yellowish brown. Wing grayish, subhyaline, yellowish at base and along costal area, patterned with seven dark brown spots along frontal margin. Spots distinctly narrower than interspaces. Stigma brown. Narrow dark brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins. Small dots missing, except one indistinct at middle of anal vein. Veins yellowish, brown in darkened areas. Venation typical for the genus: radial sector arcuate at base, *m-cu* approximately at middle of discal cell. Cell *m*₁ long, twice as long as its stem. Anal vein slightly sinuous with angulate and short-spurred distal part. It reaches wing margin approximately at the level of supernumerary cross-vein in cell *bm*, base of radial sector slightly before level of supernumerary cross-vein. Cells *r*₄ and *r*₅ with few macrotrichiae before wing margin. Stem of halter pale grayish yellow with brownish base, knob brown with pale base. Female halter 1.0 mm. Coxae dark brown, trochanters yellowish brown. Femur yellow with narrow brown apical ring. Width of rings on all femora subequal. Tibia and three basal tarsomeres yellow with indistinctly and narrowly darkened apices. Remaining tarsomeres brown. **Abdomen.** Dark brown. Ovipositor with long narrow valves, brownish at base, pale yellow at apex. Cercus slightly turned upwards.



ELEVATION. About 1000 m.

FLIGHT PERIOD. End of July.

HABITAT. Unknown.

GENERAL DISTRIBUTION. China (Jiangxi Province).

EXAMINED MATERIAL. Holotype, female (pinned), China, Kuling, Kiangsi, altitude 1000 m, July 31, 1935, O. Piel (BMNH, IOZ(E) 201082); paratype, one female (pinned), China, Kuling, Kiangsi, altitude 1000 m, July 28, 1935, O. Piel (USNM); paratype, one female (leg and wing slide-mounted), E. China, Kiangsi, Kuling, Lushani, altitude 991 m (3250 ft), July 28, 1935, O. Piel (USNM).

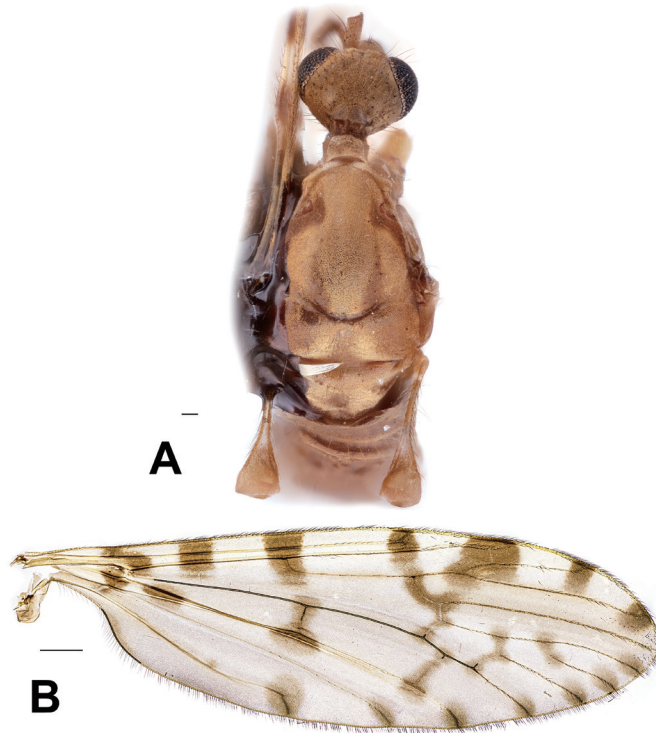


Fig. 59. *Eloephila parapriline* (Alexander, 1937), female. **A.** Thorax, dorsal view, paratype; **B.** Wing, holotype. Scale bars: A = 0.1 mm; B = 0.5 mm.

54. *Eloephila pectinistylus* Starý, 2009a (Fig. 60, Pl. 9E)

Eloephila pectinistylus Starý, 2009a: 436; Kolcsar et al., 2021: 93; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration brown with bicolorous Abdomen. Wing length 6.7–7.1 mm, but some females up to 8.6 mm long. **Head.** Dark brown, sparsely dusted with brownish gray, more densely along eye margin, with indistinct darker brown median stripe along vertex, sparsely covered with long erect brownish setae. Female antenna 2.5 mm long, reaching wing base if bent backwards. Scape dark brown, sparsely dusted with gray and bearing few setae on



dorsal surface. Pedicel subglobular, brown. Four basal flagellomeres oval, slightly swollen ventrally, brownish yellow, covered with short pale pubescence on ventral surface. Remaining segments elongate, brown to dark brown. Apical flagellomere large, 1.2 times as long as preceding segment. Longest verticils nearly twice as long as respective flagellomeres. Rostrum brown. Palpus dark brown. **Thorax.** Pronotum brown with distinct dark brown medial stripe. Postpronotum yellowish brown. Pattern of prescutum and presutural scutum barely distinct in male (Starý, 2009a), but well visible in female, composed of four narrow dark brown stripes and additional dots or spots along interspaces. Medial stripes reaching frontal margin of sclerite. They are separated by narrow interspace and narrow incomplete medial line. Lateral stripe short, starting beyond pseudosutural fovea. Interspace with few dots and elongate spots. Lateral margin of sclerite with dark spot above wing base. Pseudosutural fovea distinct, black, surrounded by yellowish area. Scutal lobe yellowish brown with small dark spot at middle. Area between lobes brownish yellow with dark brown medial stripe that extends onto light brown scutellum. Mediotergite grayish brown with indistinct darker brown medial line, and rusty brown postero-lateral margin. Pleuron brown with irregular dark brown spots. Wing grayish, subhyaline, yellowish at base, patterned with seven dark brown spots along frontal margin. Spots distinctly narrower than interspaces. Stigma not darker than surrounding spot. Narrow grayish brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins. Small spots surround vein tips at posterior wing margin, few scattered dots on longitudinal veins. Veins yellowish, brown in darkened areas. Venation typical for the genus: radial sector arcuate at base, *m-cu* at about middle of discal cell's length. Cell *m*₁ long to very long, from 1.8 times as long as its stem in holotype to 4.4 times in paratype. Anal vein slightly sinuous, slightly arched at distal end. It reaches wing margin at the level of supernumerary cross-vein in cell *bm*, base of radial sector distinctly before supernumerary cross-vein. Distal wing cells with macrotrichiae. Wing moderately broad, not widened at posterior margin, widest at tip of vein *CuP*. Halter with pale brownish stem and rusty brown base, knob dark brown or black. Female halter 1.3 mm long. Coxae dark brown spotted with reddish brown. Trochanters yellowish brown. Femur yellow with distinct but narrow dark brown apical ring. Tibia and basal tarsomere brownish yellow with narrowly darkened apices. Remaining tarsomeres brown to dark brown. Claw black. **Abdomen.** Tergites of female abdomen light brown with widely darkened posterior and lateral margins, sternites brownish yellow, with widely darkened posterior margins. Pregenital segment brown, ovipositor brown with tip of cercus yellow. Posterior margin of male epandrium slightly extended posteriorly, nearly straight. Gonocoxite strongly elongate, nearly twice as long as widest part at base. Outer gonostylus elongate, outer margin with distinct crest but without spine-shaped prolongation, finely serrate along distal margin. Apex of gonostylus with small claw-shaped spine. Inner margin of gonostylus with low, rounded subapical angle. Inner gonostylus fleshy and setose, narrows towards tip, pale with about two-thirds of inner margin brownish. Paramere with long mesal lobe widened at base and finely setose narrow apex, lateral lobe short and narrow. Aedeagus straight and long in dorsal view, extending far beyond apex of mesal process of paramere. Lateral projection of lower shelf low and rounded, medial projection extends along aedeagus. Lateral apodeme extended, triangle-shaped. Sperm pump (vesica) elongate, oval. Apodeme of vesica long and narrow, directed anteriorly, nearly reaching level of anterior margin of lateral apodeme.

ELEVATION. About 550 m.

FLIGHT PERIOD. From beginning of June, possibly middle of May, to beginning of July.



HABITAT. Unknown, presumably margins of small streams with sandy bottom.

GENERAL DISTRIBUTION. Portugal, Spain.

EXAMINED MATERIAL. Holotype, male (pinned, genitalia in microvial with glycerol on same pin), Spain, Madrid Region, Cercedilla, July 8, 1950, F. Schmid (MCSN-VD); paratype, one male (genitalia in microvial with glycerol), Spain, Region Madrid, Cercedilla, July 8, 1950, F. Schmid (collection of J. Starý); paratype, one female (pinned, wing slide-mounted), Spain, Avila, Sierra de Gredos, Arenas de San Pedro, Station 10, altitude 550 m, May 15 – June 4, 1976, P. Oosterbroek & E. Boersma (Naturalis, RMNH.INS. 1543984).

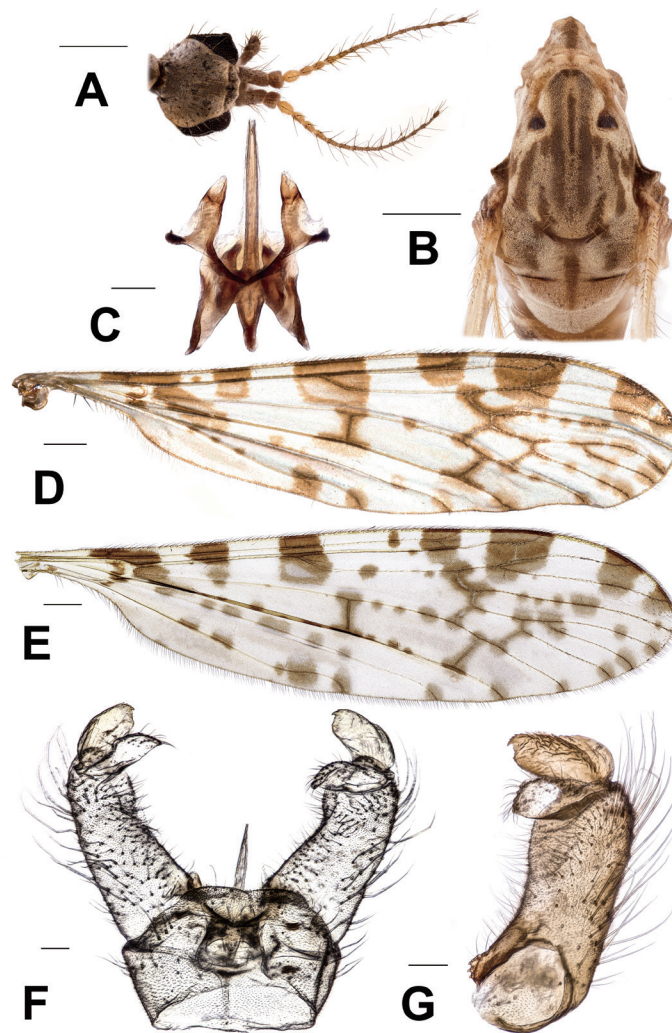


Fig. 60. *Eloeophila pectinistylus* Starý, 2009a. **A.** Head of female, dorsal view, paratype; **B.** Thorax, dorsal view, female, paratype; **C.** Aedeagal complex, dorsal view, paratype; **D.** Wing of male, holotype; **E.** Wing of female, paratype; **F.** Male genitalia, dorsal view, holotype; **G.** Gonocoxite with gonostyles, anterio-dorsal view, paratype. Scale bars: A, B, D, E = 0.5 mm; C, F, G = 0.1 mm.



55. *Eloeophila perdilata* (Alexander, 1966) (Fig. 61, Pl. 9F)

Limnophila (*Eloeophila*) *perdilata* Alexander, 1966: 221–222; 1971: 239;
Eloeophila perdilata Oosterbroek, 2023.

DESCRIPTION. General. Body coloration grayish brown with dark brown Abdomen. Male body length 8.5 mm, wing length 7.2–9.0 mm. Female body length 8.7 mm, wing length 8.5 mm. **Head.** Brown, sparsely dusted with yellowish gray, more densely along eye margin. Male antenna 1.2 mm long, reaching middle of prescutum if bent backwards. Scape dark brown, sparsely dusted with yellowish gray, elongate, nearly cylindrical. Pedicel subglobular, brown. Basal half of flagellum brownish yellow, distal grayish brown to dark brown. Flagellomeres elongate, three basal flagellomeres slightly swollen and covered with short whitish pubescence on ventral side. Longest verticils about 1.7 times as long as respective flagellomeres. Apical flagellomere large. Rostrum brown. Palpus dark brown. **Thorax.** Pronotum brownish gray with dark brown medial stripe. Prescutum and presutural scutum brownish gray with distinct pattern of dark brown spots, but without longitudinal stripes. Frontal margin of sclerite with short medial elongate spot that extends as an indistinct line towards posterior suture. Posterior half of sclerite with small separate spots and dots, arranged into longitudinal line. Lateral margin of sclerite with large dark brown spot behind pseudosutural fovea. Pseudosutural fovea distinct, dark brown. Scutal lobe brownish gray frontally, dark brown posteriorly. Area between lobes brownish-grayish yellow with brown spot posteriorly. Spot extends onto scutellum making short stripe. Scutellum grayish brown with pale lateral margin. Mediotergite brownish gray. Pleuron brownish gray with irregular dark brown spots. Wing milkish, subhyaline, yellowish at base, patterned with complete transverse dark brown stripe at the level of *Rs* base and supernumerary cross-vein and three large spots: at base, at branching point of *Rs* and at wing apex. Stigma dark brown. Narrow dark brown areas surround base and distal margin of discal cell, also *m-cu*. Numerous small spots and dots dispersed along veins and in cells. Veins yellowish, dark brown in darkened areas. Venation typical for the genus: radial sector angulate and short-spurred at base, *m-cu* at about one-third of discal cell's length. Cell *m₁* long, more than four times as long as its stem. Anal vein slightly sinuous, arched at tip. It reaches wing margin distinctly beyond level of supernumerary cross-vein in cell *bm*, base of radial sector at the level of supernumerary cross-vein. Distal wing cells without macrotrichiae. Male wing distinctly widened at posterior margin, especially at tip of anal vein. Halter with light yellowish-brown stem, brownish base, knob dark brown distally, pale basally. Male halter 0.8 mm long, female 1.0 mm. Coxae and trochanters dark brown. Femur brownish yellow, paler at base, darker towards distal end, but without distinct dark brown or black apical ring. Tibia and two basal tarsomeres pale yellow with narrowly and indistinctly darkened apices. Remaining tarsomeres brown. Claw black. Male femur I: 4.8 mm long, II: 5.4 mm, III: 6.3 mm, tibia I: 4.9 mm, II: 5.0 mm, III: 5.8 mm, tarsus I: 4.2 mm, II: 4.2 mm, III: 3.9 mm. Female femur II: 6.3 mm long, III: 6.2 mm, tibia II: 5.2 mm, III: 5.4 mm, tarsus II: 4.5 mm, III: 4.3 mm. **Abdomen.** Dark brown, covered with sparse long yellowish setae. Male genitalia brown. Posterior margin of epandrium sinuous with wide but shallow concavity at middle. Gonocoxite elongate, about 1.5 times as long as widest part at base, slightly arched, narrows apically. Outer gonostylus elongate, widened distally, outer margin smooth but with distinct crest that is extended into peg-like distal lobule. Apex of gonostylus with large claw-shaped spine. Inner margin of gonostylus with low



rounded emargination and small subbasal bump. Inner gonostylus fleshy and setose, narrower at tip, pale, with basally darkened inner margin. Paramere with long arched mesal lobe, lateral lobe short but wide. Aedeagus straight, reaching to about apex of mesal process of paramere. Lateral projection of lower shelf extends to about same level as median projection. Lateral apodeme elongate, dark brown, round-apexed. Sperm pump (vesica) elongate, oval. Apodeme of vesica directed anteriorly, dark brown, brush-shaped.

ELEVATION. From 1500 m to more than 2700 m.

FLIGHT PERIOD. From beginning of May through to middle of June.

HABITAT. Unknown.

GENERAL DISTRIBUTION. Afghanistan, India (Assam).

EXAMINED MATERIAL. Holotype, male (fore leg, wing and abdomen slide-mounted), India, Sikkim, Lachen, altitude 2713 m (8900 ft), June 13, 1959, F. Schmid (USNM); metatype, one female (antenna, legs and wing slide-mounted), East Afghanistan, Noristan, Kutiaev, altitude 1500 m, May 14, 1953, Clapperick (USNM); metatype, one male (pinned), India, Assam, NEFA, Kameng, Rupa, altitude 1585–1676 m (5200–5500 ft), May 2–3, 1961, F. Schmid (USNM); metatype, one male, one female (both pinned, male head, legs, wing and genitalia slide-mounted), India, Assam – NEFA, Kameng, Shergaon, altitude 1859–2012 m (6100–6600 ft), May 5–10, 1961, Schmid, (USNM); metatype, one female (antenna, legs and wing slide-mounted), India, Assam – NEFA, Kameng, Domkho, altitude 2103 m (6900 ft), May 11, 1961, Schmid, (USNM).

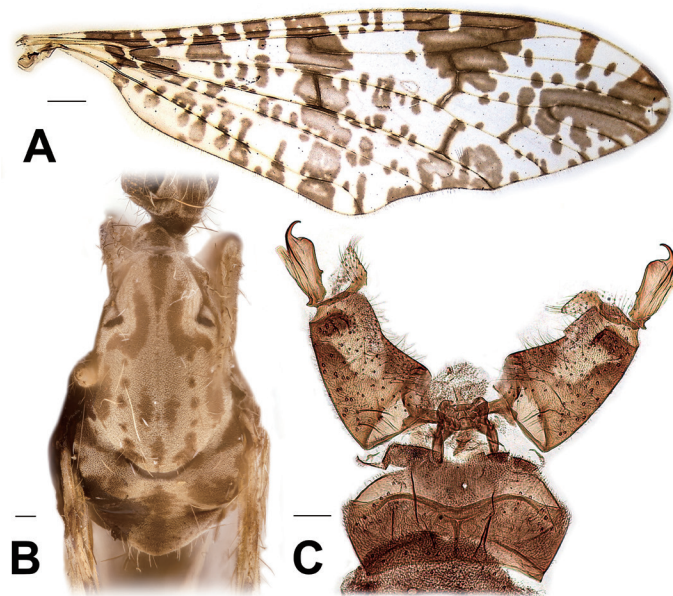


Fig. 61. *Eloeophila perdilata* (Alexander, 1966n), male. **A.** Wing, holotype; **B.** Thorax, dorsal view; **C.** Genitalia, dorsal view, metatype. Scale bars: A = 0.5 mm; B, C = 0.1 mm.



56. *Eloeophila persalsa* (Alexander, 1940) (Fig. 62, Pl. 10A)

Limnophila (*Elaeophila*) *persalsa* Alexander, 1940a: 46;

Limnophila (*Eloeophila*) *hidana* Alexander, 1970: 71–72;

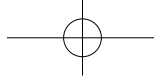
Eloeophila (*Eloeophila*) *persalsa* Savchenko, Krivolutskaya, 1976: 62;

Eloeophila persalsa Savchenko, 1983: 51; 1989: 84; Podeniene, Gelhaus, 2010: 186–189;

Devyatkov, 2020: 270; Podenas et al., 2020: 514–516; Kato, 2021: 440–442; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration dark brown dusted with gray. Male body length 4.5–7.7 mm, wing length 6.7–8.2 mm. Female body length 5.0–5.7 mm, wing length 7.5–8.5 mm. **Head.** Dark brown, densely dusted with gray and covered with sparse short erect brownish setae. Vertex without tubercle, but with fronto-dorsal darkening. Eyes widely separated in both sexes, distance between them at bases of antennae slightly exceeds length of both basal antennomeres taken together. Male antenna 1.0–1.7 mm long in male, reaching to wing base if bent backward. Antenna of female 1.0–1.2 mm long. Scape dark brown densely dusted with gray, elongate, nearly cylindrical, twice as long as pedicel. Pedicel brown, widened distally. Flagellomeres elongate, narrower towards apex of antenna, covered with whitish pubescence. Basal flagellomeres brownish yellow, distal brown to grayish brown. Apical segment subequal in length to preceding. Verticils dark brown, more than twice as long as respective segments. The rostrum, palpus and mouth parts dark brown. **Thorax.** Cervical sclerites and pronotum dark brown, densely dusted with gray. Mesonotal prescutum dark brown dorsally, brown laterally, dusted with gray, patterned with four indistinct longitudinal stripes that are getting darker towards posterior margin of sclerite, medial pair narrowly separated with gray line along middle, both stripes coming together posteriorly. Tubercular pits indistinct at frontal margin of sclerite, pseudosutural fovea distinct, polished brown to dark brown. Scutal lobe grayish brown because of dense pruinosity, with indistinct darker spot at middle. Area between lobes grayish brown, polished brown frontally. Scutellum grayish brown with a few erect yellowish setae posteriorly. Mediotergite grayish brown. Pleuron uniformly brown, covered with dense brownish gray pruinosity. Wing iridescent with grayish tinge, yellowish at base. Stigma distinct, dark brown, slightly elongated. Brownish spots at base of wing, surrounding branching points of veins and cross-veins and at tips of all longitudinal veins along wing margin. Veins brown in darkened areas, pale in light areas, yellowish at wing base. Venation: *Sc* long, reaching wing margin at branching point of *Rs*, *sc-r* about three times its own length before tip of *Sc*. *Rs* long, angulate and short-spurred at base. The free end of *R*₁ short and oblique, *R*₂ indistinct, about twice its own length before tip of *R*₁, less than its own length beyond branching point of *R*₂₊₃ and *R*₄. *R*₃ and *R*₄ diverging, cell *r*₃ with long stem, which is approximately as long as discal cell. Cross-vein *r-m* distinct, slightly beyond base of discal cell. Discal cell 2.8 times as long as wide. Cross-vein *m-cu* at about one-third of discal cell's length. Additional cross-vein in cell *bm* slightly before base of *Rs* and distinctly before tip of anal vein. Anal vein long, slightly sinuous. Anal angle wide. Halter yellow, knob same color as stem. Length of male halter 0.8–1.2 mm, that of female 1.0–1.1 mm. Coxae light brown, sparsely dusted with gray. Trochanters yellow to yellowish brown. Femur pale grayish yellow, narrowly but distinctly dark brown at apex. Tibia pale yellow with narrowly dark brown apex. Basal tarsomere pale yellow with darkened distal part, remainder of tarsus brown to dark brown. Tibia of foreleg with single apical spur, tibiae of middle and hind pairs of legs with two apical spurs each. Male





femur I: 4.0–5.4 mm long, II: 4.4–5.6 mm, III: 4.0–6.2 mm, tibia I: 5.0–5.5 mm, II: 4.2–5.4 mm, III: 4.5–6.0 mm, tarsus I: 4.0–5.5 mm, II: 3.7–4.7 mm, III: 3.5–4.4 mm. Female femur I: 4.0–4.5 mm long, II: 4.5–4.7 mm, III: 4.5–5.0 mm, tibia I: 5.0–5.2 mm, II: 4.5–4.7 mm, III: 5.2–5.5 mm, tarsus I: 4.4–4.7 mm, II: 4.2–4.6 mm, III: 4.0–4.2 mm. Claw simple, without spines. **Abdomen.** Abdominal segments brown, dusted with gray, covered with sparse yellowish erect setae. Tergites widely dark brown along posterior margin. Basal segments of female abdomen with yellowish markings at base of tergites and sternites. Male terminalia dark brown. Ninth tergite wider than longer, posterior margin widely concave at middle. Gonocoxite elongate with large rounded ventromesal bump at base. Outer gonostylus elongate, sclerotized, finely serrated along outer margin, with single claw-shaped apical lobule. Inner gonostylus long and narrow, fleshy and setose. Mesal lobe of paramere plate-shaped with widely rounded tip, setoseless, lateral lobe elongate, spine-shaped. Aedeagus short and straight, reaching to about posterior margin of mesal lobe of paramere. Lateral projection of lower shelf not expressed, median projection extending along aedeagus and reaching its tip. Lateral apodeme long and narrow, dark brown. Sperm pump (vesica) subglobular. Apodeme of vesica directed ventrally and visible only as two dark spots at base of sperm pump in dorsal view. Ovipositor brownish yellow. Cercus long, narrow and slightly arched, blunt-apexed. Hypovalva long and straight, point-apexed, reaching before middle of cercus.

ELEVATION. From the sea level to nearly 2200 m.

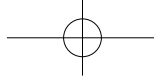
PERIOD OF ACTIVITY. From beginning of May through to middle of October.

HABITAT. Adults are active in affluent alder and willow groves and in moist mixed and coniferous forests along streams in Kurile Islands, Russia (Savchenko, Krivolutskaya, 1976).

GENERAL DISTRIBUTION. Japan, North Korea, Eastern part of Russia including Kurile and Sakhalin Islands.

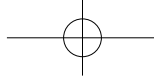
EXAMINED MATERIAL. Holotype (as *Limnophila (Elaeophila) persalsa*), male (antenna, fore leg, wing and genitalia slide-mounted), N. Corea, Seren Mts., altitude 1219 m (4000 ft), October 10, 1937, A.M. Yankovsky (USNM); holotype (as *Limnophila (Elaeophila) hidana*), female (antenna, legs and wing slide-mounted), Japan, Hida, Ontake, July 27, 1959, T. Mishima (USNM); paratype (as *Limnophila (Elaeophila) persalsa*), male (wing and genitalia slide-mounted), N. Korea, Seren Mts., altitude 1128 m (3700 ft), June 30, 1938, A.M. Yankovsky (USNM); paratype (as *Limnophila (Elaeophila) persalsa*), male (pinned, wing and genitalia slide-mounted), N. Korea, Seren Mts., altitude 914 m (3000 ft), July 5, 1938, A.M. Yankovsky (USNM); two males, two specimens with broken abdomen (pinned), North Korea, Ompo, altitude 30 m (100 ft), June 10, 1937, A.M. Yankovsky (USNM); two males (pinned), North Korea, Seren Mts., altitude 1128 m (3700 ft), June 30, 1938, A.M. Yankovsky (USNM); one specimen with broken abdomen (pinned), North Korea, Seren Mts., altitude 1067 m (3500 ft), July 2, 1938, A.M. Yankovsky (USNM); one female (pinned), North Korea, Seren Mts., altitude 762 m (2500 ft), July 3, 1938, A.M. Yankovsky (USNM); one female (pinned), North Korea, Kankyo Nando, Puksu Pyaksan, altitude 1829 m (6000 ft), July 19, 1938, A.M. Yankovsky (USNM); two males (pinned), Korea, Seren, altitude 762 m (2500 ft), August 17–18, 1938, A.M. Yankovsky (USNM); one male (pinned), Korea, Seren, altitude 610 m (2000 ft), August 17–18, 1938, A.M. Yankovsky (USNM); two females (terminalia of one female in microvial with glycerol) (pinned), North Korea, Seren Mts., altitude 305 m (1000 ft), August 18, 1938, A.M. Yankovsky (USNM); two males (pinned), North Korea, Seren Mts., altitude 762 m (2500 ft), August 21, 1938, A.M. Yankovsky (USNM); one female and one specimen with





broken abdomen (pinned), North Korea, Seren Mts., altitude 762 m (2500 ft), August 21, 1938, A.M. Yankovsky (USNM); two males (pinned), North Korea, Seren Mts., altitude 457 m (1500 ft), August 28, 1938, A.M. Yankovsky (USNM); one male (pinned), North Korea, Kankyo Nando, Puksu Pyaksan, altitude 2134 m (7000 ft), June 8, 1939, A.M. Yankovsky (USNM); one male (pinned, genitalia in microvial with glycerol), one female (pinned), North Korea, Kankyo Nando, Puksu Pyaksan, altitude 1676 m (5500 ft), June 23, 1939, A.M. Yankovsky (USNM); one male (pinned, genitalia in microvial with glycerol), two females and one specimen with broken abdomen (pinned), North Korea, Kankyo Nando, Puksu Pyaksan, altitude 1829 m (6000 ft), July 14, 1939, A.M. Yankovsky (USNM); one male (pinned), N. Korea, Chonsani, altitude 1067 m (3500 ft), July 2, 1940, A.M. Yankovsky (USNM); two females (pinned), N. Korea, Pontani Paiktusan, altitude 1372 m (4500 ft), July 17, 1940, A.M. Yankovsky (USNM); one male (pinned), N. Korea, Pontani Paiktusan, altitude 1676 m (5500 ft), August 31, 1940, A.M. Yankovsky (USNM); one male (pinned), N. Korea, Pontani Paiktusan, altitude 1524–1829 m (5000–6000 ft), July 31, 1940, A.M. Yankovsky (USNM); one male (pinned), N. Korea, Pontani Paiktusan, altitude 1829 m (6000 ft), July 31, 1940, A.M. Yankovsky (USNM); two males, two females (pinned), N. Korea, Pontani Paiktusan, altitude 1890 m (6200 ft), July 31, 1940, A.M. Yankovsky (USNM); four males (pinned), N. Korea, Pontani Paiktusan, altitude 1920 m (6300 ft), August 1, 1940, A.M. Yankovsky (USNM); one specimen with broken abdomen (pinned), N. Korea, Pontani Paiktusan, altitude 1829 m (6000 ft), August 4, 1940, A.M. Yankovsky (USNM); one male (pinned), N. Korea, Pontani Paiktusan, altitude 1676–1920 m (5500–6300 ft), August 6, 1940, A.M. Yankovsky (USNM); one female (pinned), N. Korea, Pontani Paiktusan, altitude 1829–1941 m (6000–6370 ft), August 27, 1940, A.M. Yankovsky (USNM); one male, one female (pinned), Korea, #12, Hwy. #20, 8 mi. SW of Kangnung, June 8, 1954, G.W. Byers (USNM, SMEK); three males, one female (pinned), Korea, #17, Central National Forest, 18 mi. NE Seoul, altitude 107–152 m (350–500 ft), June 20, 1954, G.W. Byers (USNM, SMEK); two males (pinned), Korea, #18, Central National Forest, 18 mi. NE Seoul, altitude 107–152 m (350–500 ft), July 6, 1954, G.W. Byers (SMEK); one female (pinned), Korea, #19, Central National Forest, 18 mi. NE Seoul, July 7, 1954, G.W. Byers (USNM); one female (pinned), Korea, #20, 2 mi. S. Pup'yong-ni, 16 mi. NE Seoul, altitude 91–137 m (300–450 ft), July 11, 1954, G.W. Byers (SMEK); one male (pinned), Korea, #23, Central National Forest, 18 mi. NE Seoul, July 27, 1954, G.W. Byers (USNM); one male (pinned), Korea, #24, Central National Forest, 18 mi. NE Seoul, altitude 122–152 m (400–500 ft), July 27, 1954, G.W. Byers (SMEK); two males, one female (pinned), Korea, #25, Central National Forest, 18 mi. NE Seoul, altitude 122–152 m (400–500 ft), August 14, 1954, G.W. Byers (SMEK); one male (pinned), Korea, #28, Central National Forest, 18 mi. NE Seoul, altitude 107–152 m (350–500 ft), August 22, 1954, G.W. Byers (SMEK); one female (pinned), Korea, #39 Central National Forest, 18 mi. NE Seoul, altitude 107–152 m (350–500 ft), September 26, 1954, G.W. Byers (SMEK); one male, three females (in ethanol), S. Korea, Gangwon-do, Pyeonchang-gun, Jinbu-myeon, Dongsan-ri, Odaesan NP, N37.73920°, E128.59398°, altitude 794 m, June 22, 2012 (1), S. Podenas (NIBR); one male (in ethanol), S. Korea, Gangwon-do, Pyeonchang-gun, Jinbu-myeon, Dongsan-ri, Odaesan NP, N37.71187°, E128.60077°, altitude 633 m, June 22, 2012 (4), S. Podenas (NIBR); one female (in ethanol), S. Korea, Gangwon-do, Samcheok-si, N 37.14899°, E 129.35933°, altitude 629 m, June 23, 2012 (1), S. Podenas (NIBR); one female (in ethanol), S. Korea, Jeollanam-do, Gurye, Toji-myeon, Naedong-ri, N35.26580°, E127.58128°, altitude 378 m, May 10, 2013, S. Podenas (NIBR); one male, one





female (in ethanol), S. Korea, Gyeonggi-do, Gapyeong-gun, Buk-myeon, Hwaak-ri, N37.98402°, E127.52676°, altitude 579 m, August 20, 2014 (2), S. Kim, S. Podenas (NIBR); one male (in ethanol), S. Korea, Gangwon-do, Hongcheon-gun, Nae-myeon, Yuljeon-ri, N37.73849°, E128.34566°, altitude 798 m, August 21, 2014 (1), S. Podenas, S. Kim (NIBR); one male (in ethanol), S. Korea, Gangwon-do, Pyeongchang-gun, Jinbu-myeon, Jangjeon-ri, N37.47153°, E128.54305°, altitude 769 m, August 22, 2014 (2), S. Podenas, S. Kim (NIBR); two males (pinned and in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.26590°, E127.58096°, altitude 446 m, August 24, 2014 (1), S. Podenas (NIBR); one female (in ethanol), S. Korea, Gyeongsangnam-do, Masanhappo-gu, Gusan-myeon, N35.12904°, E128.57147°, altitude 58 m, August 29, 2014, S. Podenas (NIBR); two females (pinned and in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.26590°, E127.58096°, altitude 446 m, June 26, 2015, S. Podenas (NIBR); three females (pinned and in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27177°, E127.57146°, altitude 490 m, June 27, 2015 (1), S. Podenas (NIBR); one female (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27177°, E127.57146°, altitude 490 m, June 28, 2015 (1), S. Podenas (NIBR); one female (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27177°, E127.57146°, altitude 490 m, June 28, 2015 (2), S. Podenas (NIBR); two males, three females (pinned and in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27177°, E127.57146°, altitude 490 m, June 29, 2015 (1), S. Podenas (NIBR); two females (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27448°, E127.56378°, altitude 593 m, July 1, 2015 (1), S. Podenas (NIBR); one male (pinned), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.26590°, E127.58096°, altitude 446 m, July 1, 2015 (3), S. Podenas (NIBR); one male (pinned), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27177°, E127.57146°, altitude 490 m, July 2, 2015 (2), S. Podenas (NIBR); one female (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27177°, E127.57146°, altitude 490 m, July 3, 2015 (1), S. Podenas (NIBR); one female (in ethanol), S. Korea, Gangwon-do, Pyeongchang-gun, Jinbu-myeon, Dongsan-ri, Odaesan NP, N37.73767°, E128.59166°, altitude 730 m, July 6, 2015 (1), S. Podenas (NIBR); three males (in ethanol), S. Korea, Gangwon-do, Pyeongchang-gun, Jinbu-myeon, Dongsan-ri, Odaesan NP, N37.72425°, E128.59814°, altitude 648 m, July 6, 2015 (2), S. Podenas (NIBR); two males (in ethanol), S. Korea, Gangwon-do, Yangyang-gun, Seo-myeon, Garapi-ri, N38.07933°, E128.52042°, altitude 160 m, July 7, 2015 (1), S. Kim, S. Podenas (NIBR); one female (in ethanol), S. Korea, Gangwon-do, Yangyang, Seo-myeon, Osaek-ri, Heullim 1 gyo (bridge), Seoraksan National Park, N38.08420°, E128.45026°, altitude 415 m, July 7, 2015 (2), S. Kim, S. Podenas (NIBR); two males (in ethanol), S. Korea, Gangwon-do, Inje-gun, Buk-myeon, Hange-ri, Jayang 3 gyo (bridge), Seoraksan National Park, N38.10415°, E128.37973°, altitude 704 m, July 7, 2015 (4), S. Kim, S. Podenas (NIBR); one female (in ethanol), S. Korea, Gangwon-do, Goseong-gun, Ganseong-eup, Jinbu-ri, N38.26678°, E128.35706°, altitude 497 m, July 8, 2015 (1), S. Kim, S. Podenas (NIBR); one male, one female (in ethanol), S. Korea, Gangwon-do, Hongcheon-gun, Duchon-myeon, Cheonhyeon-ri, near Mt. Garisan, N37.84840°, E127.98879°, altitude 304 m, July 8, 2015 (3), S. Kim, S. Podenas (NIBR); one female (in ethanol), S. Korea, Gangwon-do, Hongcheon-gun, Hwachon-myeon, Yasidae-ri, N37.82514°, E127.95530°, altitude 279 m, July 8, 2015 (4), S. Kim, S. Podenas (NIBR); one female (in ethanol), S. Korea,



Gangwon-do, Chuncheon, Dongsan-myeon, KNU Experimental Forest, N37.78194°, E127.81973°, altitude 197 m, July 9, 2015, S. Kim, S. Podenas (NIBR); one female (in ethanol), S. Korea, Gyeonggi-do, Gapyeong-gun, Buk-myeon, Jeongmok-ri, N37.97627°, E127.44160°, August – September 27, 2015, Malaise Trap (KU); one male (in ethanol), S. Korea, Gyeonggi-do, Gapyeong-gun, Buk-myeon, Jeokmok-ri, N 37.97583°, E 127.44144°, GERC-H, August 9–15, 2015, Y.J. Bae, Malaise trap (KU); one male (pinned), S. Korea, Gyeongsangbuk-do, Gyeongju, Jinhyeon-dong, N35.78755°, E129.34274°, altitude 320 m, May 27, 2016 (1), S. Podenas, H.M. Baek (NIBR); one male (in ethanol), S. Korea, Gyeongsangbuk-do, Gyeongju, Bulguk-dong, N35.79079°, E129.32555°, altitude 210 m, May 27, 2016 (3), S. Podenas, H.M. Baek, at light (NIBR); two males, two females (in ethanol), S. Korea, Gyeongsangbuk-do, Gyeongju-si, Jinhyeon-dong, Tohamsan (Mt.), 1.3 km southeast from Seokgulam, 35°47'16.7"N 129°20'21.1"E, May 27, 2016, S. Podenas, H.M. Baek (NIBR); two males, three females (in ethanol), S. Korea, Gyeongsangbuk-do, Gyeongju-si, Jinhyeon-dong, Tohamsan (Mt.), 1 km southeast from Seokgulam, 35°47'13.4"N, 129°20'31.6"E, May 27, 2016, S. Podenas, H.M. Baek (NIBR); one male (in ethanol), S. Korea, Gyeongsangbuk-do, Gyeongju-si, Yangbuk-myeon, Bulguk-ro, upper stream of Daejong-cheon, Janghang 7-gyo (Brdg.), 35°45'44.6"N, 129°21'50.4"E, May 28, 2016, S. Podenas, H.M. Baek (NIBR); two males, one female (pinned), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.26590°, E127.58096°, altitude 446 m, June 2, 2016, S. Podenas, at light (NIBR); two males, one female (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27177°, E127.57146°, altitude 490 m, June 3, 2016 (2), S. Podenas (NIBR); one female (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27333°, E127.56924°, altitude 546 m, June 3, 2016 (3), S. Podenas (NIBR); six males, five females (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.26586°, E127.58090°, altitude 448 m, June 3, 2016 (4), S. Podenas, at light (NIBR); one male, one female (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27177°, E127.57146°, altitude 490 m, June 4, 2016 (4), S. Podenas (NIBR); three males, two females (pinned and in ethanol), S. Korea, Gyeonggi-do, Yangpyeong, Cheongun-myeon, Dowon-ri, N37.54507°, E127.79483°, altitude 224 m, May 28, 2017, S. Podenas, at light (NIBR); one male (pinned), S. Korea, Gyeonggi-do, Yangpyeong, Cheongun-myeon, Dowon-ri, N37.54507°, E127.79483°, altitude 224 m, May 29, 2017, S. Podenas (NIBR); one male (in ethanol), S. Korea, Gyeonggi-do, Pocheon-si, Yeongjung-myeon, Yeongpyeong-ri, MPRC, N38.03644°, E127.23226°, altitude 150 m, June 11, 2019, T.A. Klein, H.-C. Kim, NJ trap (NIBR); one male, one female (pinned and in ethanol), S. Korea, Jeju-do, Seogwipo-si, Andeok-myeon, Gamsan-ri, N33.23694°, E126.35728°, altitude 21 m, June 21, 2019, V. Podeniene, S. Podenas (NIBR); one male (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.26586°, E127.58090°, altitude 448 m, June 25, 2019 (3), S. Podenas, at light (NIBR); one female (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Gwangui-myeon, Nodogan-ro, N35.29250°, E127.49548°, altitude 696 m, June 28, 2019 (1), S. Podenas (NIBR); one male (pinned), S. Korea, Gyeonggi-do, Gapyeong-gun, Oeseo-myeon, Samhoe-ri, Mt. Hwayasan, N37.67186°, E127.40536°, altitude 196 m, July 9, 2019 (2), S. Podenas (NIBR).



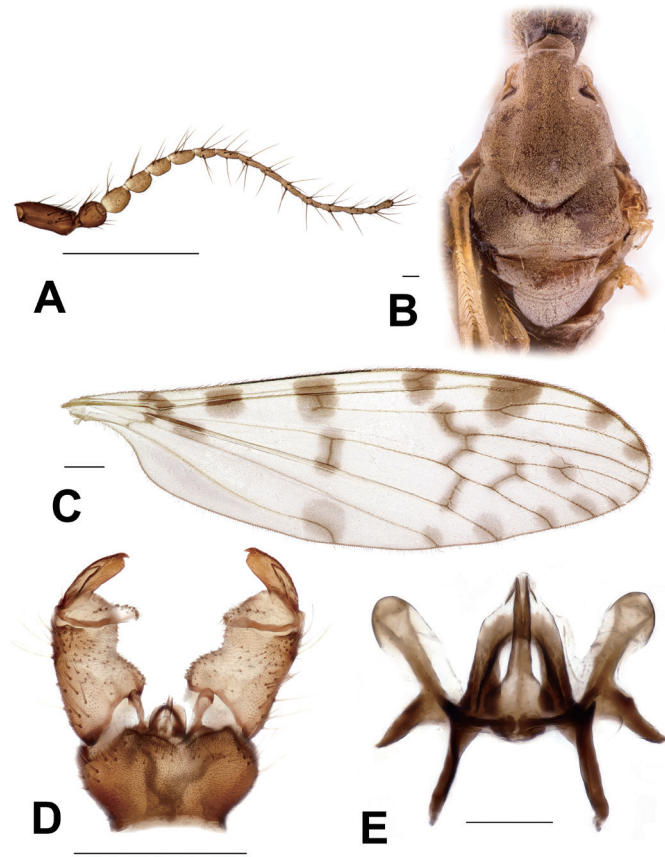
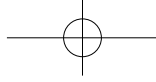


Fig. 62. *Eloeophila persalsa* (Alexander, 1940), male. **A.** Antenna; **B.** Thorax, dorsal view; **C.** Wing, holotype; **D.** Genitalia, dorsal view, metatype; **E.** Aedeagal complex, dorsal view. Scale bars: A, C, D = 0.5 mm; B, E = 0.1 mm.

57. *Eloeophila pluriguttula* (Alexander, 1966) (Fig. 63)

Limnophila (*Eloeophila*) *pluriguttula* Alexander, 1966: 222–223;
Eloeophila pluriguttula Oosterbroek, 2023.

DESCRIPTION. General. Body coloration brownish gray with obscure yellow Abdomen. Body length (sex unknown) 6.5 mm, wing length 6.4–6.8 mm. **Head.** Brown. Antenna with seven basal flagellomeres weakly bicolored, brown with yellowish apex. Distal flagellomeres uniformly brown. All flagellar segments oval. Apical flagellomere 0.8 times as long as preceding segment. Longest verticils 1.3 times as long as respective segments. Rostrum and palpus brownish black. **Thorax.** Pronotum brownish gray. Prescutum and presutural scutum gray with four longitudinal stripes, medial stripes brown, lateral darker brown, intermediate area with dark spot at posterior end. Lateral margin of sclerite brown. Scutal lobe dark brown. Scutellum and mediotergite dark brown. Pleuron



dark brown with yellowish gray spots. Wing whitish, subhyaline, yellow at base, intensely patterned with brown spots and dots. Largest brown areas surround base of radial sector, supernumerary cross-vein and cord, wide areas surround branching points and distal margin of discal cell, lots of small spots and dots distributed in cells and along veins. Stigma dark brown. Veins brown, yellowish at wing base and in interspaces between dark spots. Venation typical for the genus: base of radial sector missing in holotype, *m-cu* at about one-fourth of discal cell's length. Cell m_1 long, 3.4 times as long as its stem. Anal vein slightly sinuous, just slightly arched at tip, it reaches wing margin beyond level of supernumerary cross-vein in cell *bm*. Base of radial sector before supernumerary cross-vein. Distal wing cells without macrotrichiae. Wing narrow, not widened at posterior margin, widest at tip of vein *CuP*. Halter with obscure yellow stem and dark brown knob. Coxae dark brown to blackish, trochanters obscure yellow, blackish ventrally. Femur yellow with widely brown distal part. Tibia and basal tarsomeres yellow, distal tarsomeres brownish. Femur (sex unknown) III: 4.4 mm long, tibia III: 5.0 mm, tarsus III: 3.5 mm. **Abdomen.** Basal segments obscure yellow with dark brown posterior and lateral margins.

ELEVATION. 3500–3600 m.

FLIGHT PERIOD. Middle of June.

HABITAT. In *Rhododendron* association (Alexander, 1966).

GENERAL DISTRIBUTION. India (Sikkim).

EXAMINED MATERIAL. Holotype, sex unknown (head, hind leg and wing slide-mounted), India, Sikkim, Yagtang, altitude 3551 m (11,650 ft), June 17, 1959, F. Schmid (USNM).

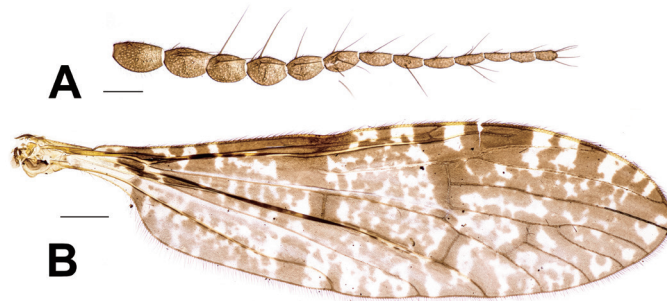


Fig. 63. *Eloeophila pluriguttula* (Alexander, 1966n), sex unknown, holotype. **A.** Antenna; **B.** Wing; Scale bars: A = 0.1 mm; B = 0.5 mm.

58. *Eloeophila prolongata* (Alexander, 1956) (Fig. 64, Pl. 10B)

Limnophila (*Elaeophila*) *prolongata* Alexander, 1956b: 283–284;

Eloeophila prolongata Oosterbroek, 2023.

DESCRIPTION. General. Body coloration dark brown with brown abdomen. Male body length 6.5 mm, wing length 7.0 mm. **Head.** Dark brown, sparsely dusted with yellowish, more densely along eye margin. Antenna grayish brown, scape elongate, pedicel subcylindrical,



flagellomeres elongate, covered with dense whitish pubescence. Male antenna 2.2 mm long, reaching slightly beyond wing base if bent backwards. Longest verticils only 0.7 times as long as respective flagellomeres. Apical flagellomere comparatively large, 0.7 times as long as preceding segment. Rostrum dark brown. Palpus blackish. **Thorax.** Pronotum brown, paler laterally, postpronotum light, yellowish brown. Prescutum and presutural scutum dark brown without longitudinal stripes. Narrow medial line darker frontally, indistinct posteriorly. Pseudosutural fovea black. Scutal lobes and area between them uniformly dark brown, concolorous with prescutum. Scutellum dark brown with yellowish posterior margin. Mediotergite grayish dark brown. Pleuron uniformly grayish dark brown. Wing grayish, subhyaline, paler at base, patterned with seven blurred dark brown spots along frontal margin. Spots wider than interspaces. Stigma dark grayish brown. Blurred grayish brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins, numerous blurred small spots evenly distributed in cells. Veins brownish gray, yellowish in interspaces between dark spots. Venation typical for the genus: radial sector angulate at base, *m-cu* at about one-third of discal cell's length. Cell *m₁* long, 1.4 times as long as its stem. Anal vein slightly sinuous, arched at tip. It reaches wing margin before the level of supernumerary cross-vein in cell *bm* but beyond base of radial sector. Distal wing cells without macrotrichiae. Male wing narrow, not widened at posterior margin, widest at tip of vein *CuP*. Stem of halter gray with yellowish base, knob blackish. Fore coxa dark brown frontally, yellowish posteriorly, middle and posterior coxae grayish dark brown. Fore trochanter yellowish, middle and posterior trochanters grayish brown. Femur yellowish brown, turning dark brown towards apex, without distinct apical ring. Tibia and basal tarsomere

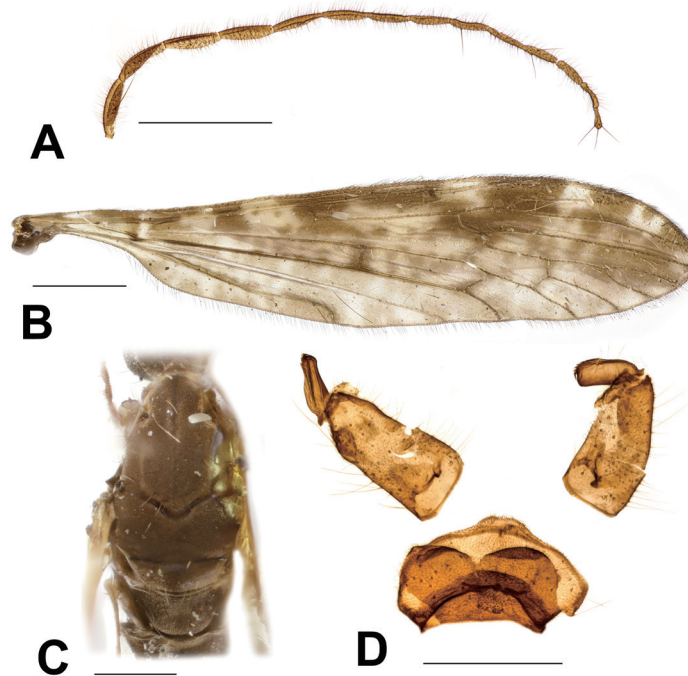


Fig. 64. *Eloeophila prolongata* (Alexander, 1956) male, holotype. **A.** Antenna; **B.** Wing; **C.** Thorax, dorsal view; **D.** Genitalia, dorsal view. Scale bars: A, C = 0.5 mm; B = 1.0 mm.



brownish yellow with narrowly darkened apices. Remaining tarsomeres brown to dark brown. Claw dark brown. **Abdomen.** Tergites grayish brown, covered with grayish pubescence, sternites obscure brownish yellow with widely darkened posterior margins. Posterior margin of epandrium with wide “V”-shaped concavity at middle, rounded laterally. Gonocoxite elongate, twice as long as widest part at base, narrows apically, basal part simple, without lobes or spines. Outer gonostylus elongate, broad, nearly parallel-sided in dorsal view, outer margin with distinct serration distally but without crest. The apical spine small, decurved and virtually appressed to the truncated apex. Inner margin of gonostylus nearly straight, making right angle with distal margin.

ELEVATION. Above 1500 m.

FLIGHT PERIOD. December or January.

HABITAT. Unknown.

GENERAL DISTRIBUTION. Uganda.

EXAMINED MATERIAL. Holotype, male (pinned, genitalia slide-mounted), Uganda, Ruwenzori Range, Fort Portal, altitude 1524 m (5000 ft), December 1934 – January 1935, F.W. Edwards (BMNH(E) #247382).

59. *Eloeophila punctulata* Starý, 2009a (Fig. 65, Pl. 10C)

Eloeophila punctulata Starý, 2009a: 436–437; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration grayish dark brown. Male body length 8.8 mm, wing length 7.7–8.8 mm. **Head.** Grayish dark brown, sparsely covered with dark brown setae. Male antenna short, 1.4–1.6 mm long, hardly reaching frontal margin of prescutum if bent backwards. Scape grayish brown, elongate, nearly cylindrical. Pedicel cup-shaped, darker brown. Basal flagellomeres oval and obscure yellow, distal segments elongate and turning grayish brown distally. Four basal flagellomeres distinctly swollen on ventral side. Longest verticils 1.4 times as long as respective flagellomeres. Apical flagellomere large, longer than preceding segment. Rostrum brown, dusted with gray. Palpus dark brown. **Thorax.** Pronotum yellowish-brownish gray with brown medial stripe. Prescutum and presutural scutum yellowish gray with four distinct dark brown longitudinal stripes. Medial stripes very distinct, starting at frontal margin of sclerite but far not reaching suture. Area separating medial stripes slightly narrower than stripe itself with indistinct fine darker medial line. Lateral stripe short, starting far beyond pseudosutural fovea, reaching suture posteriorly. Interspace with line of small spots and dots, the frontal spot largest and most distinct. Lateral margin of sclerite narrowly dark brown. Pseudosutural fovea distinct, black. Scutal lobe yellowish gray with two distinct dark brown spots closer to medial margin. Area between lobes paler gray with brown posterior spot that extends onto scutellum making short stripe. Scutellum brownish gray with light gray posterior margin. Mediotergite whitish with indistinct darker brown medial line. Pleuron gray with small irregular dark brown and yellowish-brown spots. Wing brownish, subhyaline, yellowish at base, patterned with eighth dark brown spots along frontal margin. Spots wider than interspaces. Stigma not darker than surrounding spot. Narrow brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins, small, blurred spots surround vein tips at posterior wing margin, numerous small spots or dots distributed along veins, less



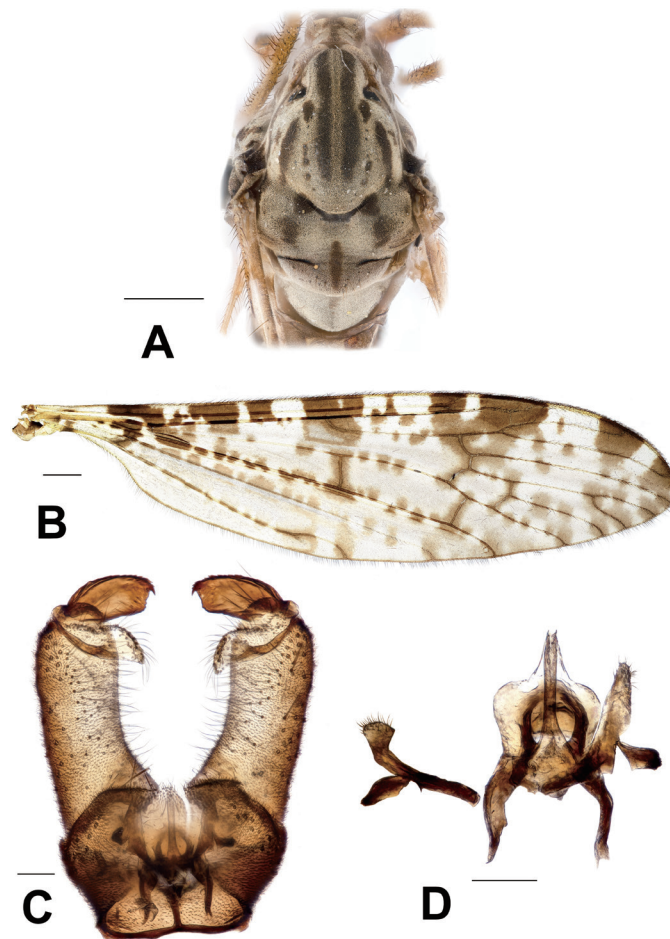
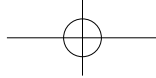


Fig. 65. *Eloeophila punctulata* Starý, 2009a male, paratype. **A.** Thorax, dorsal view; **B.** Wing; **C.** Genitalia, dorsal view; **D.** Aedeagal complex, dorsal view. Scale bars: A, B = 0.5 mm; C, D = 0.1 mm.

abundant along frontal margin. Veins yellowish, brown or dark brown in darkened areas. Venation typical for the genus: radial sector arcuate at base, *m-cu* at about middle of discal cell's length. Cell *m*₁ comparatively short, only 0.8 times as long as its stem. Anal vein nearly straight with slightly arched tip and short subapical spur. It reaches wing margin slightly beyond level of supernumerary cross-vein in cell *bm*, base of radial sector before supernumerary cross-vein. Distal wing cells with few macrotrichiae. Male wing narrow, not widened at posterior margin, widest at tip of vein *CuP*. Male halter 1.0–1.1 mm long, stem pale, rusty brown at base, knob dark brown. Fore coxa dark brown dorsally, rusty brown ventrally, middle and hind coxae entirely dark brown. Trochanters yellowish brown. Femur brownish yellow, narrowly pale at base, with distinct dark brown apical ring. Tibia and basal tarsomere brownish yellow with narrowly darkened apices. Remaining tarsomeres brown to dark brown. Claw black. Male femur II: 6.8 mm long, III: 6.9 mm, tibia II: 5.9 mm, III: 6.8 mm, tarsus II: 5.0 mm, III: 4.2 mm. **Abdomen.** Segments brown with widely blackened posterior margins. Pregenital segment entirely dark brown or blackish. Male genitalia with dark



brown ninth segment and brown gonocoxites. Epandrium slightly extended posteriorly, posterior margin nearly straight, covered with dense short blackish setae. Gonocoxite elongate, 2.2 times as long as widest part at base, slightly arched, distal part nearly as wide as basal. Outer gonostylus wide, elongate, nearly parallel-sided in dorsal view, outer margin with indistinct crest, serrate distally. Apex of gonostylus with claw-shaped spine. Inner margin of gonostylus extended into blunt subapical emargination. Inner gonostylus fleshy and setose, narrower at tip, pale with more than half of inner margin brown. Paramere with elongate blunt-apexed and setose mesal lobe, lateral lobe short and blackened. Aedeagus straight with shallowly bifid apex, extending beyond apex of mesal process of paramere. Lateral projection of lower shelf rounded, medial projection extends along aedeagus. Lateral margin of lower shelf smooth. Lateral apodeme elongate, slightly curved before middle. Sperm pump (vesica) slightly elongate, oval. Apodeme of vesica elongate, finger-shaped, turned ventrally and hardly visible in dorsal view.

ELEVATION. From 800 m to 1250 m.

FLIGHT PERIOD. Species, probably, has two generations a year, the first flying in May, the second from the beginning of August through to the end of October.

HABITAT. Margins of rivers and brooks.

GENERAL DISTRIBUTION. Greece (Crete Island) and Cyprus.

EXAMINED MATERIAL. Paratype, one male (pinned, wing slide-mounted), Cyprus, Trodos Mts., River S of Mesopotamos Monastery, altitude 900–1100 m, October 20, 1992, P. Oosterbroek & F.M. Hartveld C8 (Naturalis, RMNH.INS.1543980); paratype, one male (pinned), Greece, Crete, Khania Region, Kakopetros, brook, May 23, 2004, J. Starý (NRC).

60. *Eloeophila pusilla* (Kuntze, 1920) (Fig. 66, Pl. 10D)

Ephelia pusilla Kuntze, 1920: 56;

Eloeophila pusilla Savchenko et al., 1992: 219; Starý, 2004; 2009a: 430–431; Oosterbroek, 2023.

DESCRIPTION. General. Brown species with darker brown Abdomen. Male wing length 4.0–4.6 mm. **Head.** Brown, sparsely dusted with gray and covered with sparse long brown setae. Male antenna 0.9 mm long, reaching to about middle of prescutum if bent backwards. Both basal antennomeres brown to dark brown. Flagellum brownish yellow, slightly darker distally, flagellomeres oval, covered with short pale pubescence ventrally. Longest verticils 2.1 times as long as respective flagellomeres. Apical flagellomere large. Rostrum brown. Palpus dark brown. **Thorax.** Pronotum grayish dark brown, postpronotum pale brown. Prescutum and presutural scutum nearly uniformly grayish brown, longitudinal stripes very indistinct or completely missing. Pseudosutural fovea distinct, dark brown. Scutal lobe concolorous with prescutum, indistinctly darker along anterior margin. Area between lobes yellowish brown. Scutellum brown, dusted with light gray, paler along posterior margin. Mediotergite grayish brown, slightly paler anteriorly. Pleuron brown, katepisternum slightly darker. Dorsopleural membrane brownish yellow. Wing grayish, subhyaline, yellowish at base, patterned with six small grayish brown spots along frontal margin. Spots narrower than interspaces. Stigma not darker than surrounding dark spot. Indistinct grayish areas surround cord, distal margin of discal cell, cross-veins and branching points of veins. Indistinct small spots



surround vein tips at posterior wing margin. Veins pale, grayish, yellowish at wing base and along costal area, brownish in darkened areas. Venation typical for the genus: radial sector long, arcuate at base. Discal cell usually closed (Stary, 2009a, Fig. 30), only left wing of studied specimen from Spain has open discal cell due to reduction of vein *m-m*, right wing of same specimen with closed discal cell. Position of cross-vein *m-cu* slightly varies individually from slightly before to slightly beyond middle of discal cell. Length of cell *m*₁ varies individually from slightly less to slightly more than length of its stem. Anal vein nearly straight, just slightly bent at tip. It reaches wing margin slightly before level of supernumerary cross-vein in cell *bm*, base of radial sector distinctly before supernumerary cross-vein. Distal wing cells with very few macrotrichiae. Male wing moderately widened at posterior margin, widest at tip of vein *CuP*. Stem of halter pale, knob blackish, dusted with light gray. Male halter 0.8 mm long. Fore coxa brown dorsally, yellow ventrally, middle and posterior coxae obscure yellow, narrowly brownish at base and paler at apex. Trochanters pale yellow. Femur and tibia yellow without or with very indistinct apical darkening. Basal tarsomere

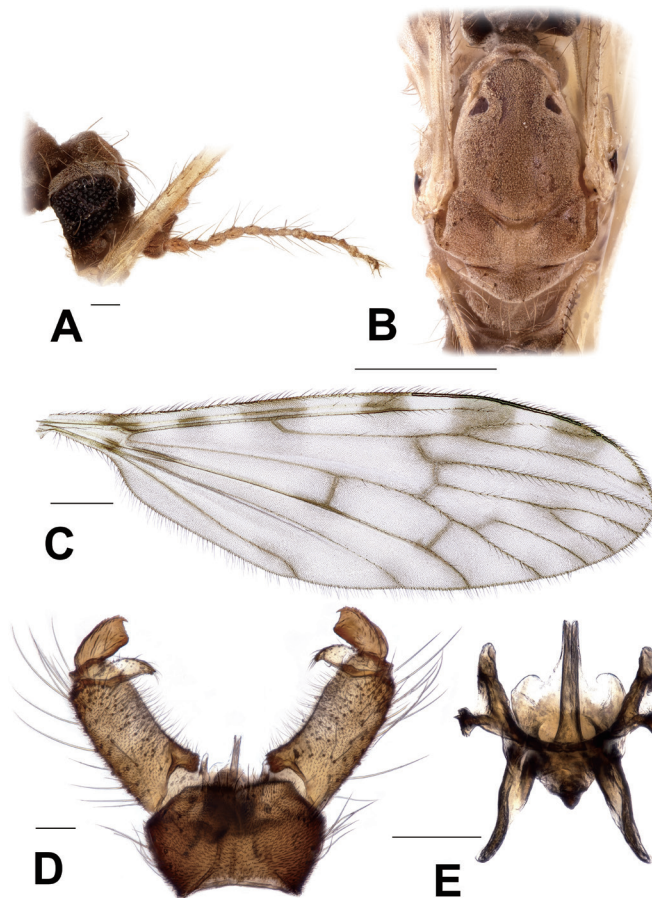


Fig. 66. *Eloeophila pusilla* (Kuntze, 1920) male. **A.** Head, lateral view; **B.** Thorax, dorsal view; **C.** Aberrant wing with open discal cell; **D.** Genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A, D, E = 0.1 mm; B, C = 0.5 mm.



yellow, indistinctly darker at apex, remaining tarsomeres brown. Claw dark brown. Male femur II: 3.7 mm long, tibia II: 3.0 mm, tarsus II: 2.3 mm. **Abdomen.** Tergites dark brown with narrowly gray posterior margins, sternites obscure yellow with widely dark posterior and lateral margins. Pregenital segment dark brown. Abdominal segments covered with sparse long erect yellowish setae. Male genitalia with brown ninth segment and yellowish brown gonocoxites. Epandrium slightly extended posteriorly, posterior margin nearly straight, slightly concave at middle, covered with short dense blackish setae. Gonocoxite elongate, nearly twice as long as widest part at base, slightly arched, rounded apically, with small 3-dentate ventro-mesal lobule. Outer gonostylus wide, elongate, slightly narrower at base, outer margin without crest, serrate at distal end, inner margin nearly smooth, making large right angle with distal margin. Apex of gonostylus with small spine. Inner gonostylus fleshy and setose, narrower at tip, pale with brown inner margin. Paramere with elongate finger-shaped mesal lobe lacking any setae in studied specimen, but Starý (2009) mentions that it could be without or with a few setulae, his illustration, Fig. 8, is showing setose condition, lateral lobe short, peg-shaped. Lateral projection of lower shelf arched, median projection extends posteriorly. Aedeagus straight, medium-long, slightly exceeding tip of mesal process of paramere and distinctly exceeding posterior edge of lateral projection of lower shelf. Illustration (Fig.8) of Starý (2009) not agrees with his description, showing aedeagus exceeding tip of lateral projection of lower shelf as well as tip of paramere, but this illustration closely fits with specimen from Spain except median projection of lower shelf. Very transparent median projection of lower shelf could be easily overlooked. Lateral margin of lower shelf smooth. Lateral apodeme long and narrow, slightly curved at middle. Sperm pump (vesica) elongate, ovoid. Apodeme of vesica very small.

ELEVATION. 1200 m.

FLIGHT PERIOD. July.

HABITAT. Unknown.

GENERAL DISTRIBUTION. France (Corsica), Spain.

EXAMINED MATERIAL. One male (pinned), Spain, Huesca, Canfranc, altitude 1200 m, July 6, 1975, A.E. Stubbs, B.M. 1975-389 (BMNH).

61. *Eloeophila sabrina* (Alexander, 1929) (Fig. 67, Pl. 10E)

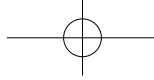
Limnophila (*Ephelia*) *sabrina* Alexander, 1929: 189-190; 1930b: 269;

Limnophila (*Elaeophila*) *sabrina* Alexander, 1943b: 386;

Eloeophila sabrina Oosterbroek, 2023.

DESCRIPTION. General. Body coloration brown with grayish thorax and yellowish Abdomen. Male body length 4.6-5.6 mm, female 6.5-7.6 mm, male wing length 5.6-8.0 mm, female 7.5-8.0 mm. **Head.** Dark brown, densely dusted with gray, narrowly light gray along eye margin, covered with sparse short yellowish setae. Male antenna 1.1-1.6 mm long, reaching slightly beyond wing base if bent backwards. Female antenna 1.4 mm long. Scape brown, sparsely dusted with gray, elongate, nearly cylindrical. Pedicel cup-shaped, light brown. Flagellum brown, flagellomeres elongate. Seven basal flagellomeres slightly enlarged and covered with short scarce pubescence on ventral side. Apical flagellomere moderately elongate, four-fifths as long as preceding segment.





Longest verticils just slightly exceed length of respective flagellomeres. Rostrum brown. Palpus dark brown. **Thorax.** Pronotum grayish brown with darker medial spot, postpronotum pale brown. Prescutum and presutural scutum grayish yellow with three brown longitudinal stripes. Medial stripe short but wide with indistinct darker line along middle, more distinct anteriorly. Lateral stripe narrow, reaching posterior margin of sclerite. Interspace with numerous darker dots. Lateral margin of sclerite without darkening. Pseudosutural fovea distinct, dark brown, comma-shaped. Scutal lobe brown, densely dusted with gray, lateral margin yellowish. Area between lobes pale brownish yellow. Scutellum brownish, densely dusted with light gray, pale along posterior margin, covered with sparse long whitish setae. Mediotergite light, pale brownish with very indistinct darker brown medial line. Pleuron dark brown, dusted with yellowish. Wing grayish, subhyaline, yellowish at base and along costal margin, patterned with seven dark brown spots along frontal margin. Spots narrower than interspaces. Stigma dark brown, not darker than surrounding spot. Indistinct grayish brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins. Indistinct small spots surround vein tips at posterior wing margin. Veins brownish yellow, yellow at wing base and costal area, dark brown in darkened areas, pale along cord. Venation typical for the genus: radial sector angulate and short-spurred at base, *m-cu* slightly before middle discal cell. Cell *m₁* long, 1.3 times as long as its stem. Anal vein slightly sinuous. It reaches wing margin close to the level of supernumerary cross-vein in cell *bm*, base of radial sector distinctly before supernumerary cross-vein. Distal wing cells without macrotrichiae. Male wing narrow, not widened at posterior margin, widest at tip of vein *CuP*. Halter brownish yellow. Male halter 0.9–1.2 mm long, female 1.2 mm. Coxae and trochanters yellow, just base of fore coxa brown. Femur obscure yellow, pale at base, darker brown at distal end. Tibia and two basal tarsomeres light yellowish brown with narrowly and indistinctly darkened apices. Remaining tarsomeres dark brown. Claw black. Male femur I: 4.2–5.7 mm long, II: 4.6–5.2 mm, III: 4.4–6.2 mm, tibia I: 3.9–6.1 mm, II: 4.2–4.3 mm, III: 4.9–5.2 mm, tarsus I: 4.1–5.1 mm, II: 3.6–4.0 mm, III: 3.6–4.4 mm. **Abdomen.** Tergites yellowish brown with caudal margins broadly dark brown, very margin narrowly light gray. Sternites more yellowish. Pregenital segment dark brown with narrowly gray posterior margin. Male genitalia with dark brown ninth segment and brown gonocoxites. Epandrium slightly extended posteriorly, caudal margin with wide but shallow concavity, covered with fine dense setae. Gonocoxite elongate, 1.4 times as long as widest part at base in slide-mounted specimens, narrows apically, with distinct invagination at about one-third length of mesal surface. Outer gonostylus long and narrow, nearly parallel-sided with large spine-shaped crest on outer margin and small apical spine. Gonostylus and crest finely serrate at distal end, inner margin smooth, except distal part. Inner gonostylus fleshy and setose, nearly oval, pale with brown inner margin. Paramere with wide, nearly oval mesal lobe, lateral lobe narrow, point-apexed. Aedeagus straight and long in dorsal view, extending to about apex of mesal process of paramere, apex shallowly bifid. Lateral projection of lower shelf extended into small lobule, median projection reaches along aedeagus. Lateral margin of lower shelf smooth. Lateral apodeme elongate, distal half strongly widened. Sperm pump (vesica) subglobular. Apodeme of vesica short, peg-shaped.

ELEVATION. From sea level to 1000 m.

FLIGHT PERIOD. From early April through to late July.

HABITAT. Margins of streams, near waterfalls.

GENERAL DISTRIBUTION. Canada (New Brunswick, Quebec), USA (Connecticut,



Maryland, Massachusetts, New York, North Carolina, South Carolina and Vermont).

EXAMINED MATERIAL. Paratype, male (pinned), USA, New York, Essex Co., Keene Valley, May 26, 1920, H. Notman (USNM); paratype, male (pinned), USA, Massachusetts, Amherst, altitude 84 m (275 ft), June 5, 1924, C.P. Alexander (USNM); paratype, male (pinned, wing and genitalia slide-mounted), USA, Vermont, Lamoille Co., Stowe, June 14, 1927, C.P. Alexander (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, North Carolina, Swannanoa, Black Mountain, N. Fork, May (USNM); one specimen of unclear sex, probably female (pinned), USA, New York, Nassau Co., Town of Oyster Bay, Sea Cliff, June, L.I. (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Maryland, Montgomery Co., Cabin John, Md, April 28, C.H. Curran (USNM); two males (pinned, genitalia of one specimen in microvial with glycerol on same pin), USA, Virginia, Dead Run, May 10, 1916, W.L. McAtee (USNM); two males (pinned, genitalia of one specimen in microvial with glycerol on same pin), USA, Massachusetts, Amherst, altitude 84 m (275 ft), June 1, 1925, C.P. Alexander (USNM); one male (antenna, wing and genitalia slide-mounted), USA, Vermont, Stowe, June 14, 1927, C.P. Alexander (USNM); one

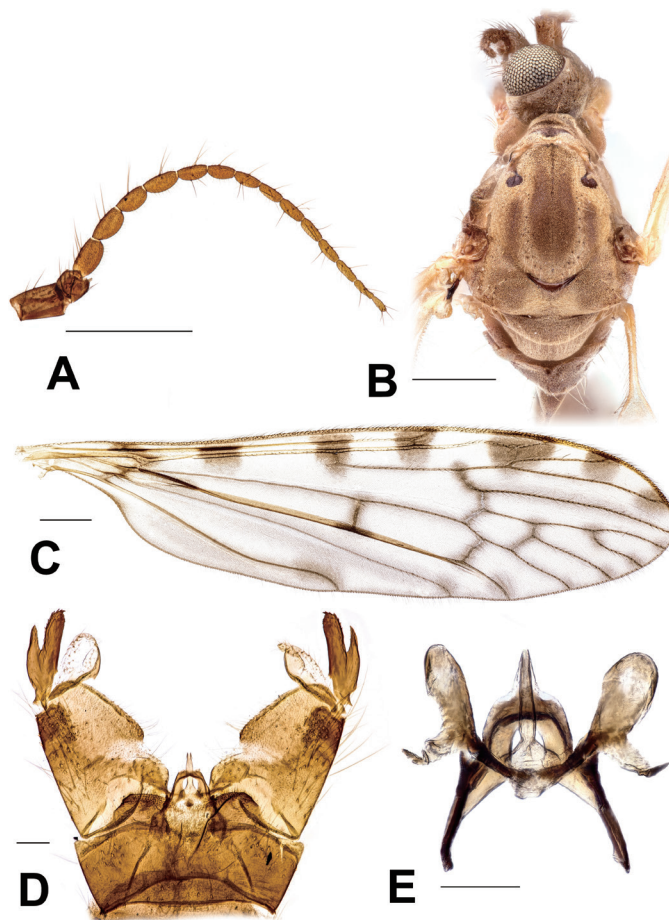
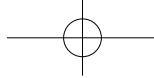


Fig. 67. *Eloeophila sabrina* (Alexander, 1929), male. **A.** Antenna; **B.** Wing; **C.** Thorax, dorsal view; **D.** Genitalia, dorsal view. Scale bars: A–C = 0.5 mm; D = 0.1 mm.





female (pinned), Canada, Quebec, Covey Hill, June 18, 1927, G.S. Walley (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), Canada, Quebec, Knowlton, June 20, 1927, G.S. Walley (USNM); one female (pinned), Canada, Quebec, Kazubazua, July 20, 1927, F.P. Ide (USNM); one male (pinned, wing and genitalia slide-mounted), USA, Connecticut, waterfall near Winsted, June 9, 1929, C.P. Alexander (USNM); one male (wing and genitalia slide-mounted), Canada, Quebec, Metapedia, Gaspi, June 22, 1929, C.P. Alexander (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), Canada, New Brunswick, Lepreau Harbor, June 25, 1929, C.P. Alexander (USNM); one male (antenna, wing, leg and genitalia slide-mounted), USA, South Carolina, Greenville, April 10, 1932, H.K. Townes (USNM); two males, one female (pinned, male genitalia in microvial with glycerol on same pin), USA, North Carolina, Mitchell Game Refuge, altitude 975 m (3200 ft), June 5, 1940, C.P. Alexander (USNM); one male (antenna, wing, hind leg and genitalia slide-mounted), USA, Massachusetts, Amherst, June 6, 1943, M.E. Smith (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Virginia, Fort Belvoir, May 1946 (USNM); one male (pinned), USA, Pennsylvania, Chester Co., Stroud Research Center, vic. Sawmill Spring (± 1 km WSW London Grove, E fork of E branch White Clay Creek, $39^{\circ}51'54''\text{N}$, $75^{\circ}46'54''\text{W}$, altitude 113 m, April 26, 1994, J. Gelhaus #612 (ANSP, specimen record #5824).

62. *Eloeophila serenensis* (Alexander, 1940) (Fig. 68, Pl. 10F)

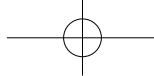
Limnophila (*Elaeophila*) *serenensis* Alexander, 1940a: 47;

Eloeophila serenensis Savchenko, 1983: 51; 1989: 84; Podenas et al., 2020: 516–519; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration dark brown dusted with gray. Male body length 3.7–6.0 mm, wing length 5.5–6.6 mm. Female body length 4.5–7.0 mm, wing length 5.8–7.5 mm. **Head.** Dark brown, densely dusted with gray and covered with sparse short erect brown setae. Vertex without tubercle. Eyes widely separated in both sexes, distance between them at bases of antennae approximately same as length of both basal antennomeres taken together. Antenna dark brown, 1.6–1.8 mm long in male, nearly reaching wing base, if bent backward. Female antenna 1.0–1.7 mm long. Scape dusted with gray, elongate, nearly cylindrical, twice as long as pedicel. Pedicel widened distally. Flagellomeres elongate, narrower towards apex of antenna, covered with dense whitish pubescence. Apical segment subequal in length to preceding. Vercils dark brown, longest twice as long as respective segments. Rostrum and palpus dark brown, labella brown. **Thorax.** Cervical sclerites and pronotum dark brown, dusted with gray. Mesonotal prescutum dark brown, dusted with gray, with four indistinct longitudinal stripes that are getting darker towards posterior margin of sclerite, medial and lateral stripe reaching each other. Tubercular pits indistinct at frontal margin of sclerite, pseudosutural fovea distinct, polished black, surrounded by yellowish brown area. Scutal lobe brown, dusted with gray, with indistinct darker spot in the middle. Area between lobes brownish gray. Scutellum grayish brown. Mediotergite grayish brown, darker posteriorly. Pleuron brown, densely dusted with gray, katapisternum darkened ventrally. Wing iridescent with brownish tinge, yellowish at base. Stigma distinct, dark brown, slightly elongate. Brownish spots



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at base of wing, along frontal margin, surrounding branching points of veins and cross-veins and at tips of all longitudinal veins along wing margin. Veins brownish, darker in darkened areas, yellowish at wing base. Venation: *Sc* long, reaching wing margin slightly before branching point of *Rs*, *sc-r* four–five times its own length before tip of *Sc*. *Rs* long, arched at base. Free end of *R*₁ short, slightly arched, *R*₂ indistinct, about its own length before tip of *R*₁, less than its own length beyond branching point of *R*₂₊₃ and *R*₄. *R*₃ and *R*₄ diverging, cell *r*₃ with long stem, which is approximately as long as *m-cu*. Cross-vein *r-m* distinct, slightly beyond base of discal cell. Discal cell twice as long as wide. Cross-vein *m-cu* slightly before middle of discal cell. Additional cross-vein in cell *bm* distinctly beyond base of *Rs* and before tip of anal vein. Cell *m*₁ long, 1.3 times as long as its stem. Anal vein long, slightly sinuous. Anal angle wide, posterior margin widely rounded. Halter pale yellow, knob same color as stem. Male halter 0.8–1.0 mm long, female 0.7–1.0 mm. Frontal coxae brown, yellowish ventrally, remaining coxae obscure yellow, sparsely dusted with gray. Trochanters obscure yellow. Femur yellow, narrowly but distinctly dark brown at apex in most specimens, but just indistinctly darkened in other. Tibia yellow with narrowly dark brown apex, darkening varies depending on specimen. Basal tarsomere yellowish basally, brown distally, remainder of tarsus brown to dark brown. Tibia of foreleg with single apical spur, tibiae of middle and hind pairs of legs with two apical spurs each. Male femur I: 3.0–4.6 mm long, II: 4.0–4.6 mm, III: 4.0–5.5 mm, tibia I: 4.4–4.6 mm, II: 4.5–4.8 mm, III: 4.0–5.0 mm, tarsus I: 3.9–4.4 mm, II: 3.8–4.4 mm, III: 3.2–3.5 mm. Female femur I: 3.7–4.5 mm long, II: 4.5–4.7 mm, III: 4.8–5.1 mm, tibia I: 4.1–4.5 mm, II: 4.2–4.7 mm, III: 4.7–5.1 mm, tarsus I: 3.5–4.0 mm, II: 3.1–3.7 mm, III: 3.1–3.6 mm. Claw simple, without spines. **Abdomen.** Tergites dark brown, dusted with gray, covered with sparse yellowish erect setae. Sternites yellow, pale yellow at base of abdomen, with wide dark brown lateral and posterior margins. Male terminalia brownish yellow. Ninth tergite wider than longer, posterior margin widely concave at middle. Gonocoxite elongate, widened ventro-medially at base. Outer gonostylus sclerotized, blade-shaped, with two apical spines, sometimes partly worn or broken in older specimens. Inner gonostylus fleshy, elongate, setose. Paramere with long and narrow arched mesal lobe, lateral lobe very small, approximately at the middle of paramere. Aedeagus straight and medium-long in dorsal view, extending nearly to the apex of mesal process of paramere. Lateral projection of lower shelf not expressed, median projection extends along aedeagus. Lateral margin of lower shelf smooth. Lateral apodeme long and narrow, slightly arched. Sperm pump (vesica) oval. Apodeme of vesica short, visible only as dark spot in dorsal view. Ovipositor brownish-grayish yellow. Cercus long, narrow and slightly arched, blunt-apexed. Hypoalva long and straight, point-apexed, reaching to about middle of cercus.

ELEVATION. From sea level to more than 2100 m.

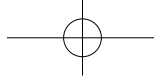
FLIGHT PERIOD. Adults are active from early May through to middle of October.

HABITAT. Small clean streams and springs with moss-covered rocks surrounded by dense deciduous trees and shrubs in mountainous areas, sometimes around channels running through agricultural fields, marshy areas densely covered with willow shrubs. Species is attracted to light.

GENERAL DISTRIBUTION. Korean Peninsula (North and South Korea), Far East of Russia.

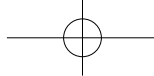
EXAMINED MATERIAL. Holotype (as *Limnophila (Elaeophila) persalsa*), male (antenna, fore leg, wing and genitalia slide-mounted), N. Corea, Seren Mts., altitude 1219 m (4000 ft), October 10, 1937, A.M. Yankovsky (USNM); two males and two specimens with broken abdomen (pinned), North Korea, Ompo, altitude 30 m (100 ft), June 10, 1937, A.M. Yankovsky (USNM); two males





(pinned), Korea, Seren, altitude 762 m (2500 ft), August 17–18, 1938, A.M. Yankovsky (USNM); one male (pinned), Korea, Seren, altitude 610 m (2000 ft), August 17–18, 1938, A.M. Yankovsky (USNM); two males (pinned), North Korea, Seren Mts., altitude 762 m (2500 ft), August 21, 1938, A.M. Yankovsky (USNM); two males (pinned), North Korea, Seren Mts., altitude 457 m (1500 ft), August 28, 1938, A.M. Yankovsky (USNM); one male (pinned), North Korea, Kankyo Nando, Puksu Pyaksan, altitude 2134 m (7000 ft), June 8, 1939, A.M. Yankovsky (USNM); one male (pinned), N. Korea, Chonsani, altitude 1067 m (3500 ft), July 2, 1940, A.M. Yankovsky (USNM); two females (pinned), N. Korea, Pontani Paiktusan, altitude 1372 m (4500 ft), July 17, 1940, A.M. Yankovsky (USNM); one male (pinned), N. Korea, Pontani Paiktusan, altitude 1676 m (5500 ft), July 31, 1940, A.M. Yankovsky (USNM); one male (pinned), N. Korea, Pontani Paiktusan, altitude 1524–1829 m (5000–6000 ft), July 31, 1940, A.M. Yankovsky (USNM); one male (pinned), N. Korea, Pontani Paiktusan, altitude 1829 m (6000 ft), July 31, 1940, A.M. Yankovsky (USNM); two males, two females (pinned), N. Korea, Pontani Paiktusan, altitude 1890 m (6200 ft), July 31, 1940, A.M. Yankovsky (USNM); four males (pinned), N. Korea, Pontani Paiktusan, altitude 1920 m (6300 ft), August 1, 1940, A.M. Yankovsky (USNM); one specimen with broken abdomen (pinned), N. Korea, Pontani Paiktusan, altitude 1829 m (6000 ft), August 4, 1940, A.M. Yankovsky (USNM); one male (pinned), N. Korea, Pontani Paiktusan, altitude 1676–1920 m (5500–6300 ft), August 6, 1940, A.M. Yankovsky (USNM); one female (pinned), N. Korea, Pontani Paiktusan, altitude 1829–1942 m (6000–6370 ft), August 27, 1940, A.M. Yankovsky (USNM); one male, one female (pinned), Korea, #12, Hwy. #20, 8 mi. SW of Kangnung, June 8, 1954, G.W. Byers (USNM, SMEK); three males, one female (pinned), Korea, #17, Central National Forest, 18 mi. NE Seoul, altitude 107–152 m (350–500 ft), June 20, 1954, G.W. Byers (USNM, SMEK); two males (pinned), Korea, #18, Central National Forest, 18 mi. NE Seoul, altitude 107–152 m (350–500 ft), July 6, 1954, G.W. Byers (SMEK); one female (pinned), Korea, #19, Central National Forest, 18 mi. NE Seoul, July 7, 1954, G.W. Byers (USNM); one female (pinned), Korea, #20, 2 mi. S. Pup'yong-ni, 16 mi. NE Seoul, altitude 91–137 m (300–450 ft), July 11, 1954, G.W. Byers (SMEK); one male (pinned), Korea, #23, Central National Forest, 18 mi. NE Seoul, July 27, 1954, G.W. Byers (USNM); one male (pinned), Korea, #24, Central National Forest, 18 mi. NE Seoul, altitude 122–152 m (400–500 ft), July 27, 1954, G.W. Byers (SMEK); two males, one female (pinned), Korea, #25, Central National Forest, 18 mi. NE Seoul, altitude 122–152 m (400–500 ft), August 14, 1954, G.W. Byers (SMEK); one male (pinned), Korea, #28, Central National Forest, 18 mi. NE Seoul, altitude 107–152 m (350–500 ft), August 22, 1954, G.W. Byers (SMEK); one female (pinned), Korea, #39 Central National Forest, 18 mi. NE Seoul, altitude 107–152 m (350–500 ft), September 26, 1954, G.W. Byers (SMEK); one male, one female (pinned), Russia, Far East, Nature Reserve “Kedrovaya Padj”, Barabash, July 13, 1989 (VU); one male, three females (in ethanol), S. Korea, Gangwon-do, Pyeonchang-gun, Jinbu-myeon, Dongsan-ri, Odaesan NP, N37.73920°, E128.59398°, altitude 794 m, June 22, 2012 (1), S. Podenas (NIBR); one male (in ethanol), S. Korea, Gangwon-do, Pyeonchang-gun, Jinbu-myeon, Dongsan-ri, Odaesan NP, N37.71187°, E128.60077°, altitude 633 m, June 22, 2012 (4), S. Podenas (NIBR); one female (in ethanol), S. Korea, Gangwon-do, Samcheok-si, N37.14899°, E129.35933°, altitude 629 m, June 23, 2012 (1), S. Podenas (NIBR); one female (in ethanol), S. Korea, Jeollanam-do, Gurye, Toji-myeon, Naedong-ri, N35.26580°, E127.58128°, altitude 378 m, May 10, 2013, S. Podenas (NIBR); one male, one female (in ethanol), S. Korea, Gyeonggi-do, Gapyeong-gun, Bukmyeon, Hwaak-ri, N37.98402°, E127.52676°, altitude 579 m, August 20, 2014 (2), S. Kim, S.





Podenas (NIBR); one male (in ethanol), S. Korea, Gangwon-do, Hongcheon-gun, Nae-myeon, Yuljeon-ri, N37.73849°, E128.34566°, altitude 798 m, August 21, 2014 (1), S. Podenas, S. Kim (NIBR); one male (in ethanol), S. Korea, Gangwon-do, Pyeongchang-gun, Jinbu-myeon, Jangjeon-ri, N37.47153°, E128.54305°, altitude 769 m, August 22, 2014 (2), S. Podenas, S. Kim (NIBR); two males (pinned and in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.26590°, E127.58096°, altitude 446 m, August 24, 2014 (1), S. Podenas (NIBR); one female (in ethanol), S. Korea, Gyeongsangnam-do, Masanhappo-gu, Gusan-myeon, N35.12904°, E128.57147°, altitude 58 m, August 29, 2014, S. Podenas (NIBR); two females (pinned and in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.26590°, E127.58096°, altitude 446 m, June 26, 2015, S. Podenas (NIBR); three females (pinned and in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27177°, E127.57146°, altitude 490 m, June 27, 2015 (1), S. Podenas (NIBR); one female (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27177°, E127.57146°, altitude 490 m, June 28, 2015 (1), S. Podenas (NIBR); one female (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27177°, E127.57146°, altitude 490 m, June 28, 2015 (2), S. Podenas (NIBR); two males, three females (pinned and in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27177°, E127.57146°, altitude 490 m, June 29, 2015 (1), S. Podenas (NIBR); two females (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27448°, E127.56378°, altitude 593 m, July 1, 2015 (1), S. Podenas (NIBR); one male (pinned), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N 35.26590°, E 127.58096°, altitude 446 m, July 1, 2015 (3), S. Podenas (NIBR); one male (pinned), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N 35.27177°, E 127.57146°, altitude 490 m, July 2, 2015 (2), S. Podenas (NIBR); one female (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27177°, E127.57146°, altitude 490 m, July 3, 2015 (1), S. Podenas (NIBR); one female (in ethanol), S. Korea, Gangwon-do, Pyeongchang-gun, Jinbu-myeon, Dongsan-ri, Odaesan NP, N37.73767°, E128.59166°, altitude 730 m, July 6, 2015 (1), S. Podenas (NIBR); three males (in ethanol), S. Korea, Gangwon-do, Pyeongchang-gun, Jinbu-myeon, Dongsan-ri, Odaesan NP, N37.72425°, E128.59814°, altitude 648 m, July 6, 2015 (2), S. Podenas (NIBR); two males (in ethanol), S. Korea, Gangwon-do, Yangyang-gun, Seo-myeon, Garapi-ri, N38.07933°, E128.52042°, altitude 160 m, July 7, 2015 (1), S. Kim, S. Podenas (NIBR); one female (in ethanol), S. Korea, Gangwon-do, Yangyang, Seo-myeon, Osaek-ri, Heullim 1 gyo (bridge), Seoraksan National Park, N38.08420°, E128.45026°, altitude 415 m, July 7, 2015 (2), S. Kim, S. Podenas (NIBR); two males (in ethanol), S. Korea, Gangwon-do, Inje-gun, Buk-myeon, Hangye-ri, Jayang 3 gyo (bridge), Seoraksan National Park, N38.10415°, E128.37973°, altitude 704 m, July 7, 2015 (4), S. Kim, S. Podenas (NIBR); one female (in ethanol), S. Korea, Gangwon-do, Goseong-gun, Ganseong-eup, Jinbu-ri, N38.26678°, E128.35706°, altitude 497 m, July 8, 2015 (1), S. Kim, S. Podenas (NIBR); one male, one female (in ethanol), S. Korea, Gangwon-do, Hongcheon-gun, Duchon-myeon, Cheonhyeon-ri, near Mt. Garisan, N37.84840°, E127.98879°, altitude 304 m, July 8, 2015 (3), S. Kim, S. Podenas (NIBR); one female (in ethanol), S. Korea, Gangwon-do, Hongcheon-gun, Hwachon-myeon, Yasidae-ri, N37.82514°, E127.95530°, altitude 279 m, July 8, 2015 (4), S. Kim, S. Podenas (NIBR); one female (in ethanol), S. Korea, Gangwon-do, Chuncheon, Dongsan-myeon, KNU Experimental Forest, N37.78194°, E127.81973°, altitude 197 m, July 9, 2015, S. Kim, S. Podenas (NIBR); one female (in



ethanol), S. Korea, Gyeonggi-do, Gapyeong-gun, Buk-myeon, Jeongmok-ri, N37.97627°, E127.44160°, August – September 27, 2015, Malaise Trap (KU); one male (in ethanol), S. Korea, Gyeonggi-do, Gapyeong-gun, Buk-myeon, Jeokmok-ri, N 37.97583°, E 127.44144°, GERC-H, August 9–15, 2015, Y.J. Bae, Malaise trap (KU); one male (pinned), S. Korea, Gyeongsangbuk-do, Gyeongju, Jinhyeon-dong, N35.78755°, E129.34274°, altitude 320 m, May 27, 2016 (1), S. Podenas, H.M. Baek (NIBR); one male (in ethanol), S. Korea, Gyeongsangbuk-do, Gyeongju, Bulguk-dong, N35.79079°, E129.32555°, altitude 210 m, May 27, 2016 (3), S. Podenas, H.M. Baek, at light (NIBR); two males, two females (in ethanol), S. Korea, Gyeongsangbuk-do, Gyeongju-si, Jinhyeon-dong, Tohamsan (Mt.), 1.3 km southeast from Seokgulam, 35°47'16.7"N 129°20'21.1"E, May 27, 2016, S. Podenas, H.M. Baek (NIBR); two males, three females (in ethanol), S. Korea, Gyeongsangbuk-do, Gyeongju-si, Jinhyeon-dong, Tohamsan (Mt.), 1 km southeast from Seokgulam, 35°47'13.4"N, 129°20'31.6"E, May 27, 2016, S. Podenas, H.M. Baek (NIBR); one male (in ethanol), S. Korea, Gyeongsangbuk-do, Gyeongju-si, Yangbuk-myeon, Bulguk-ro, upper stream of

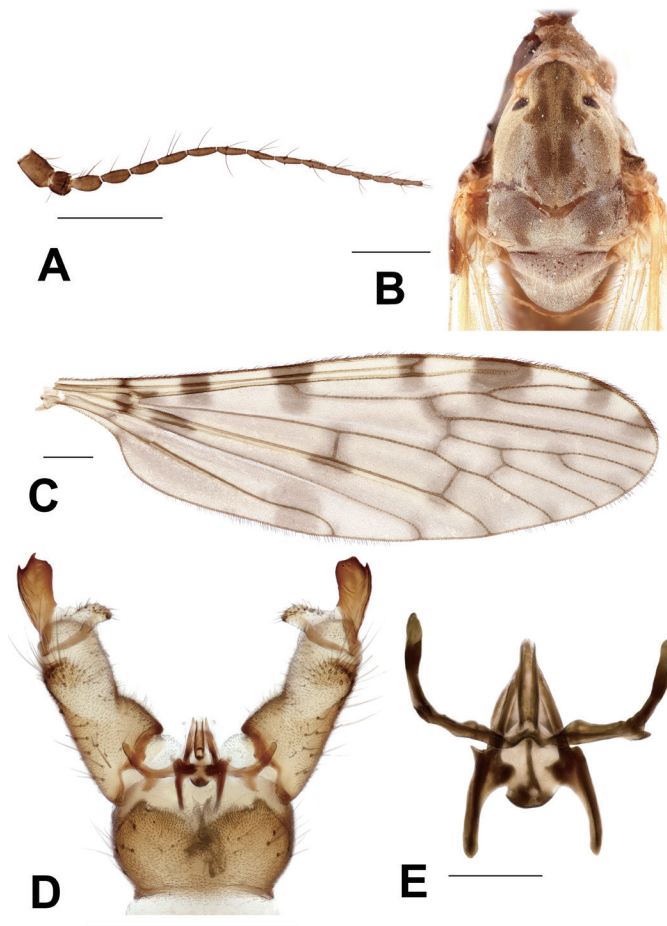


Fig. 68. *Eloeophila serenensis* (Alexander, 1940) male. **A.** Antenna; **B.** Thorax, dorsal view; **C.** Wing; **D.** Genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A-D = 0.5 mm; E = 0.1 mm.



Daejong-cheon, Janghang 7-gyo (Brdg.), 35°45'44.6"N, 129°21'50.4"E, May 28, 2016, S. Podenas, H.M. Baek (NIBR); two males, one female (pinned), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.26590°, E127.58096°, altitude 446 m, June 2, 2016, S. Podenas, at light (NIBR); two males, one female (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27177°, E127.57146°, altitude 490 m, June 3, 2016 (2), S. Podenas (NIBR); one female (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27333°, E127.56924°, altitude 546 m, June 3, 2016 (3), S. Podenas (NIBR); six males, five females (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.26586°, E127.58090°, altitude 448 m, June 3, 2016 (4), S. Podenas, at light (NIBR); one male, one female (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27177°, E127.57146°, altitude 490 m, June 4, 2016 (4), S. Podenas (NIBR); three males, two females (pinned and in ethanol), S. Korea, Gyeonggi-do, Yangpyeong, Cheongun-myeon, Dowon-ri, N37.54507°, E127.79483°, altitude 224 m, May 28, 2017, S. Podenas, at light (NIBR); one male (pinned), S. Korea, Gyeonggi-do, Yangpyeong, Cheongun-myeon, Dowon-ri, N37.54507°, E127.79483°, altitude 224 m, May 29, 2017, S. Podenas (NIBR); one male (in ethanol), S. Korea, Gyeonggi-do, Pocheon-si, Yeongjung-myeon, Yeongpyeong-ri, MPRC, N38.03644°, E127.23226°, altitude 150 m, June 11, 2019, T.A. Klein, H.-C. Kim, NJ trap (NIBR); one male, one female (pinned and in ethanol), S. Korea, Jeju-do, Seogwipo-si, Andeok-myeon, Gamsan-ri, N33.23694°, E126.35728°, altitude 21 m, June 21, 2019, V. Podeniene, S. Podenas (NIBR); one male (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.26586°, E127.58090°, altitude 448 m, June 25, 2019 (3), S. Podenas, at light (NIBR); one female (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Gwangui-myeon, Nodogan-ro, N35.29250°, E127.49548°, altitude 696 m, June 28, 2019 (1), S. Podenas (NIBR); one male (pinned), S. Korea, Gyeonggi-do, Gapyeong-gun, Oeseo-myeon, Samhoe-ri, Mt. Hwayasan, N37.67186°, E127.40536°, altitude 196 m, July 9, 2019 (2), S. Podenas (NIBR).

63. *Eloeophila serotinella* (Alexander, 1926) (Fig. 69, Pl. 11A)

Limnophila (*Ephelia*) *serotinella* Alexander, 1926a: 110–111; 1927b: 57, 64;

Limnophila (*Elaeophila*) *serotinella* Alexander, 1943b: 386;

Eloeophila serotinella Oosterbroek, 2023.

DESCRIPTION. General. Body coloration grayish brown, abdomen yellowish. Male body length 4.2–4.8 mm, female 4.2–4.3 mm, male wing length 4.9–5.5 mm, female 4.8 mm. **Head.** Dark brown, densely covered with gray pruinosity. Vertex with indistinct darker brown medial stripe. Male antenna 0.9–1.3 mm long, reaching to about middle of prescutum if bent backwards. Scape dark brown, elongate. Pedicel subglobular, brown, sparsely dusted with yellowish. Flagellum brownish yellow at base, turning darker brown towards apex. Three basal flagellomeres oval, remaining segments elongate. Four basal segments widened ventrally and covered with dense pale pubescence. Longest verticils 1.8 times as long as respective flagellomeres. Apical flagellomere elongate. Rostrum and palpus brown. **Thorax.** Pronotum brown, slightly darker dorso-medially, postpronotum lighter. Prescutum and presutural scutum reddish brown to dark brown without longitudinal stripes.



Pseudosutural fovea concolorous with prescutum, widely surrounded by light gray area. Scutal lobe reddish brown, margins yellowish. Area between lobes yellowish. Scutellum reddish brown, densely dusted with yellowish. Mediotergite rusty brown. Pleuron darker brown dorsally, grayish ventrally. Dorsopleural membrane brownish yellow. Wing brownish, subhyaline, yellowish at base and along costal margin, patterned with seven dark brown spots along frontal margin. Spots subequal or narrower than interspaces except wide interspace at the middle of *Rs*. Stigma not darker than surrounding spot. Narrow grayish brown areas surround cord, distal margin of discal cell, cross-veins, branching points and vein tips at posterior wing margin. Veins brownish, yellow at wing base, darker brown in darkened areas. Venation typical for the genus: radial sector arcuate at base, *m-cu* at about one-third of discal cell's length. Cell *m*₁ long, slightly longer than its stem. Anal vein slightly sinuous. It reaches wing margin slightly beyond level of supernumerary cross-vein in cell *bm*, base of radial sector distinctly before supernumerary cross-vein. Distal wing cells without macrotrichiae. Male wing narrow, not widened at posterior margin, widest at the middle between tips of veins *CuA* and *CuP*. Stem of halter pale with brownish base, knob dark brown, paler basally. Male halter 0.8–0.9 mm long. Fore coxa obscure yellow with brown base, middle and posterior coxae entirely obscure yellow. Trochanters yellow. Femur yellow, paler at base, with dark brown apical ring. Darker area subequal on all legs. Tibia brownish yellow with narrowly and indistinctly darkened apex. Tarsus brown, darker distally. Claw dark brown to black. Male femur I: 4.1 mm long, II: 4.4 mm, III: 4.7 mm, tibia I: 4.9 mm, II: 4.2 mm, III: 5.0 mm, tarsus I: 3.2 mm, II: 3.9 mm, III: 3.2 mm.

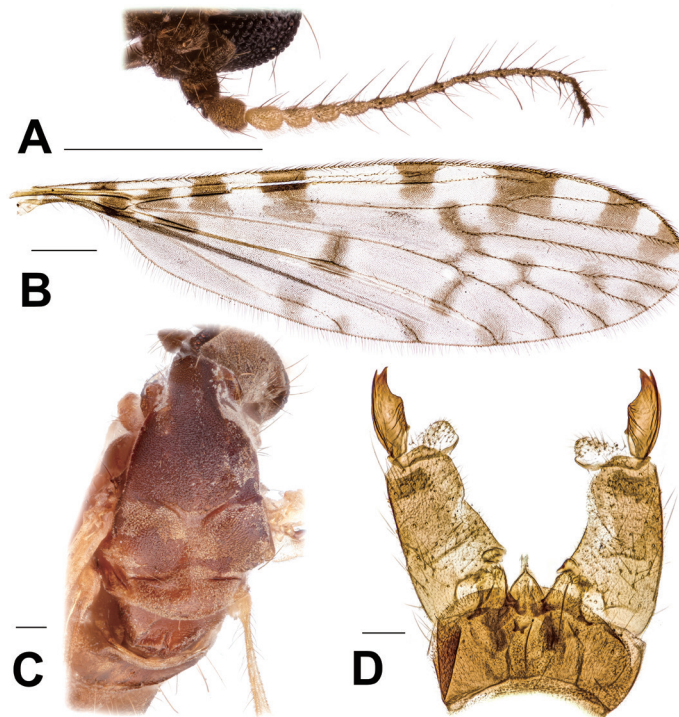


Fig. 69. *Eloeophila serotinella* (Alexander, 1926), male, paratype. **A.** Antenna; **B.** Wing; **C.** Thorax, dorsal view; **D.** Genitalia, dorsal view. Scale bars: A, B = 0.5 mm; C, D = 0.1 mm.



Abdomen. Basal tergite dark brown dusted with gray, remaining tergites yellow with dark brown lateral and indistinctly darkened posterior margins, pregenital tergite yellowish brown with distinctly dark brown posterior and lateral margins. Sternites yellow with distinctly darkened posterior and lateral margins. Genital segment dark brown with yellow gonocoxites and posterior margin of hypandrium. Epandrium distinctly wider than longer, posterior margin widely rounded. Gonocoxite elongate, approximately twice as long as widest part at base. Outer gonostylus elongate, basal half wide, distal half narrows into apical spine. Crest on outer margin low, but extended into sharp spine apically, thus making whole gonostylus bidentate at apex. Inner margin smooth, widest at middle, distal part with slightly arched margin. Inner gonostylus fleshy and setose, slightly widening towards blunt apex, pale, with darker brown inner margin. Paramere with wide plate-shaped mesal lobe, lateral lobe short and narrow, darkened. Aedeagus straight, reaching slightly beyond apex of mesal process of paramere, apex bifid. Lateral projection of lower shelf not expressed, low. Lateral margin of lower shelf smooth. Lateral apodeme elongate, slightly arched. Sperm pump (vesica) elongate, oval. Apodeme of vesica short, bifid at tip.

ELEVATION. All type specimens were captured at 500 m, collecting altitudes of other specimens are unknown.

FLIGHT PERIOD. Beginning of September.

HABITAT. Unknown.

GENERAL DISTRIBUTION. USA (Florida, South Carolina and Tennessee).

EXAMINED MATERIAL. Paratypes, two males (pinned), USA, Tennessee, Fentress Co., Allardt, altitude 503 m (1650 ft), September 3, 1924, J.S. Rogers (USNM).

64. *Eloeophila serrulata* (Alexander, 1932) (Fig. 70)

Limnophila (*Elaeophila*) *serrulata* Alexander, 1932: 120–122;

Eloeophila serrulata Zhang et al., 2017: 72; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration black with yellowish gray dorsum of Thorax. Male body length 4.2 mm, wing length 5.0–5.1 mm. **Head.** Blackish, narrowly gray along eye margin, vertex sparsely dusted with gray anteriorly. Male antenna 1.1 mm long, reaching to about middle of prescutum if bent backwards. Both basal antennomeres black, flagellum pale brown with flagellomeres turning darker towards apex. Basal flagellomeres swollen on ventral face. Rostrum and palpus black. **Thorax.** Prescutum and presutural scutum yellowish gray with conspicuous dark brown stripes and spots. Medial stripe long, but not reaching frontal margin of sclerite and interrupted before the suture posteriorly. Anterior end of lateral stripe bends towards medial stripe. Interspace with three or four dark brown dots. Lateral margin of sclerite darkened beyond pseudosutural fovea. Scutal lobe blackened. Pseudosutural fovea distinct, black. Pleuron black with irregular grayish spots. Wing milkish, subhyaline, yellowish at base and along costal margin, distinctly patterned with dark brown spots and dots: irregular spot at wing base, complete transverse suture extending through base of *Rs* and supernumerary cross-vein in cell *bm*, large spot covering tip of *Sc*, branching point of *Rs* and reaching tip of *R₁*, two nearly separate spots at tips of *R₃* and *R₄*, posterior wing margin narrowly darkened starting from tip of *R₅* towards tip of anal vein,



indistinct grayish brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins, brown dots evenly distributed through cells and along veins. Stigma slightly darker than surrounding spot. Veins yellowish, especially in prearcular and costal areas, darker brown in darkened areas. Venation typical for the genus: radial sector angulate and short-spurred at base, *m-cu* just slightly removed beyond base of discal cell. Cell *m₁* long, 1.3 times as long as its stem. Anal vein slightly sinuous, more arched at tip. It reaches wing margin distinctly beyond level of supernumerary cross-vein in cell *bm*, base of radial sector slightly before supernumerary cross-vein. Distal wing cells without macrotrichiae. Male wing distinctly widened at posterior margin, widest at tip of anal vein. Halter with yellow stem and brownish black knob. Coxa blackish. Trochanter blackish with paler base. Femur yellow with brown subterminal ring and pale-yellow apex. Tibia and basal tarsomeres yellow, remaining tarsomeres brownish. **Abdomen.** Tergites black, sternites brownish with widely darkened posterior and lateral margins. Male genitalia with dark brown ninth segment and brown gonocoxites. Posterior margin of epandrium shallowly but widely concave. Gonocoxite comparatively short, approximately as long as widest part at base, distinctly swollen at base of mesal surface. Outer gonostylus elongate, narrower at base, with large apical spine. Outer margin with low crest that extends into subapical spine, finely serrate on both margins. Inner margin of gonostylus slightly curved, extended into wide-angled subapical emargination. Inner gonostylus fleshy and setose, narrower at tip, pale, with about half of inner margin darkened. Paramere with wide, round-apexed, plate-shaped mesal lobe, lateral lobe short but wide with anterior margin extended into spine. Aedeagus straight and long in dorsal view, extending slightly beyond apex of mesal process of paramere. Lateral projection of lower shelf extended into spine-shaped structure, median projection not expressed. Lateral apodeme long and narrow, slightly arched at middle, dark brown. Sperm pump (vesica) elongate, oval. Apodeme of vesica visible as small dark dot in dorsal view.

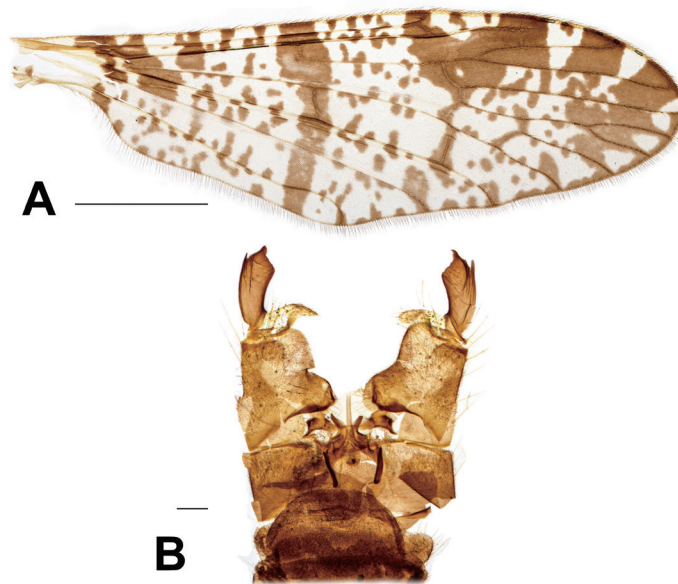


Fig. 70. *Eloeophila serrulata* (Alexander, 1932) male, holotype. **A.** Wing; **B.** Genitalia, dorsal view. Scale bars: A = 0.5 mm; B = 0.1 mm.



ELEVATION. Slightly above 1200 m.

FLIGHT PERIOD. End of July.

HABITAT. Unknown.

GENERAL DISTRIBUTION. China (Provinces Shaanxi and Sichuan).

EXAMINED MATERIAL. Holotype, male (antenna, wing, leg and genitalia slide-mounted), W. China, Szechwan [Sichuan], Kwanhsien, altitude 1219 m (4000 ft), July 28, 1930, Franck (USNM).

65. *Eloeophila seticellula* (Alexander, 1938) (Fig. 71, Pl. 11B)

Limnophila (*Tricephelia*) *seticellula* Alexander, 1938: 74–75; 1940b: 632; 1941a: 286;

Limnophila (*Elaeophila*) *seticellula* Byers, 2002: 6, 22;

Eloeophila seticellula Petersen et al., 2005: 7; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration brown to dark brown or blackish, sparsely dusted with yellowish gray. Male body length 4.5–6.6 mm, wing length 5.5–7.1 mm. Female body length 6.0–7.5 mm, wing 5.9–7.4 mm. **Head.** Dark brown to blackish, sparsely dusted with brownish gray, narrowly light gray along eye margin, covered with sparse light brown setae. Male antenna 0.9–1.4 mm long, extending to about wing base if bent backwards. Female antenna 1.3–1.4 mm long. Both basal antennomeres dark brown, flagellum brownish yellow, slightly darker towards apex. Scape elongate, nearly cylindrical, approximately 1.7 times as long as subglobular pedicel. Flagellomeres elongate, six basal flagellomeres covered with short pale pubescence ventrally. Apical flagellomere large, 1.4 times as long as preceding segment. Longest verticils 1.8 times as long as respective flagellomeres. Rostrum and palpus black. **Thorax.** Pronotum brown, dusted with gray, postpronotum paler. Prescutum and presutural scutum yellowish brown without distinct longitudinal stripes, or these stripes are so wide that nearly entirely cover whole surface leaving just narrow indistinct dark brown interspaces before the suture. Pseudosutural fovea dark brown, surrounded by yellowish gray area. Scutal lobe darker brown, yellowish posteriorly. Area between lobes dark brown. Scutellum yellowish, especially along posterior margin. Mediotergite grayish brown, darker laterally. Pleuron brown, densely dusted with gray, with distinct longitudinal dark brown stripe extending from head to the abdomen through the base of halter. Ventral surface of katapisternum blackened. Wing grayish, subhyaline, yellowish at base and along costal margin, patterned with seven dark brown spots along frontal margin. Spots distinctly narrower than interspaces. Stigma dark brown. Narrow grayish brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins. Small indistinct spots surround vein tips at posterior wing margin. Veins light brown to yellow and pale yellow, darker in darkened areas. Venation typical for the genus: radial sector arcuate at base, *m-cu* at about one-third of discal cell's length. Cell *m*₁ long, 1.4 times as long as its stem. Anal vein nearly straight, just slightly arched at tip. It reaches wing margin slightly before level of supernumerary cross-vein in cell *bm*, nearly at the same level as base of *Rs*. Distal wing cells with abundant macrotrichiae. Male wing narrow, not widened at posterior margin, widest at tip of vein *CuP*. Halter with pale yellow stem and brownish base, knob slightly infuscate. Male and female halter 0.9–1.1 mm long. Fore coxa brownish dorsally, obscure yellow ventrally.



Middle and posterior coxae brownish yellow. Trochanters yellow. Femur yellow with paler base and brown apex. Tibia and basal tarsomere obscure yellow with narrowly and indistinctly darkened apices. Remaining tarsomeres brown. Claw dark brown. Male femur I: 3.9–4.7 mm long, II: 4.1–5.5 mm, III: 4.1–5.6 mm, tibia I: 4.0–5.3 mm, II: 3.6–4.8 mm, III: 3.9–5.4 mm, tarsus I: 3.4–4.4 mm, II: 3.5–4.3 mm, III: 3.3–3.9 mm. Female femur I: 5.2 mm long, III: 4.8–5.6 mm, tibia I: 5.0 mm, III: 4.0–5.1 mm, tarsus I: 3.9 mm, III: 3.4–4.4 mm. **Abdomen.** Dark brown to black. Male genitalia brownish yellow. Posterior margin of epandrium slightly concave, covered with dense short setulae. Gonocoxite slightly elongate, 1.5 times as long as widest part at base in slide-mounted specimens, without mesal enlargement. Outer gonostylus long and narrow, blackened apically, arched and tipped with strong spine, outer margin with low crest that extends into subapical spine at about four-fifths of gonostylus length, inner margin smooth, without enlargement. Inner gonostylus fleshy and setose, oval with rounded apex, pale with narrowly darkened basal half of inner margin. Mesal lobe of paramere extended into knob-shaped structure lacking any setae, lateral lobe small. Aedeagus straight and wide, extending far beyond apex of mesal process of paramere. Lower shelf with low lateral projection and smooth lateral margin. Lateral apodeme wide, elongate, dark brown.

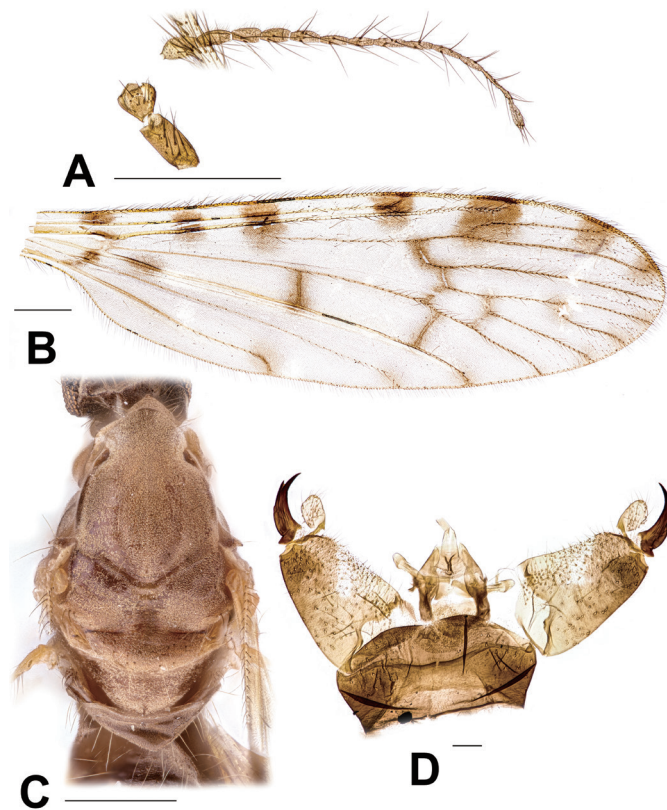


Fig. 71. *Eloeophila seticellula* (Alexander, 1938), male. **A.** Antenna; **B.** Wing, holotype; **C.** Genitalia, dorsal view. Scale bars: A, B = 0.5 mm; C, D = 0.1 mm.



ELEVATION. From about 400 m to 2000 m.

FLIGHT PERIOD. From late April through to middle of July.

HABITAT. Herbaceous growth along upland streams (Byers, 2002).

GENERAL DISTRIBUTION. USA (Georgia, North Carolina, South Carolina, Tennessee, Virginia).

EXAMINED MATERIAL. Holotype, male (wing and genitalia slide-mounted), USA, South Carolina, Greenville, River Falls, July 1, 1931, N. Townes (USNM); one male (pinned), USA, North Carolina, Cedar Mountain, altitude 914 m (3000 ft), June 12, 1940, C.P. Alexander (USNM); one male (pinned), USA, North Carolina, Clingmans Dome, altitude 1951 m (6400 ft), June 25, 1940, C.P. Alexander (USNM); six males, three females (pinned), USA, North Carolina, Smokemont, altitude 1067 m (3500 ft), June 25, 1940, C.P. Alexander (USNM); one male, one female (pinned), USA, North Carolina, Smokemont, altitude 671 m (2200 ft), June 30, 1940, C.P. Alexander (USNM); one female (pinned), USA, Virginia, Shenandoach, Big Meadows, June 15, 1941, A.L. Melander (USNM); metatype (as *Limnophila (Trichephelia) seticellula*), one male (pinned, antenna, leg, wing and genitalia slide-mounted), USA, Georgia, Neel Gap, May 22, 1946, P.W. Fattig (USNM); seven males, one specimen of unclear sex (pinned, genitalia of one male in microvial with glycerol on same pin), USA, Virginia, Stoney Mountain, June 30, 1946, A.B. Gurney (USNM).

66. *Eloeophila shannoni* (Alexander, 1921) (Fig. 72, Pl. 11C)

Limnophila (Idioptera) shannoni Alexander, 1921: 132–133;

Limnophila (Elaeophila) shannoni Alexander, 1945: 424; 1954: 63;

Eloeophila shannoni Oosterbroek, 2023.

DESCRIPTION. General. Body coloration brown with dark brown Abdomen. Male body length 6.2–7.5 mm, female 7.1–7.8 mm, male wing length 7.5–8.6 mm, female 7.6–8.8 mm. **Head.** Dark brown, densely covered with light gray, more densely frontally and along eye margin. Male antenna 1.9–3.7 mm long, nearly reaching base of abdomen if bent backwards, female antenna 1.8–1.9 mm long. Whole antenna uniformly brown or yellowish brown. Flagellomeres elongate, decreasing in length towards apex, covered with short pale pubescence, denser ventrally. Apical flagellomere small, less than half as long as preceding segment. Longest verticils 1.5 times as long as respective flagellomeres. Rostrum brown, palpus darker brown. **Thorax.** Pronotum light brown, densely covered with light gray pruinosity, postpronotum light, brownish yellow with dense cover of whitish pruinosity. Prescutum and presutural scutum dark brown medially, yellowish laterally, paler posteriorly, without distinct longitudinal stripes or spots, densely dusted with yellowish gray. Lateral margin of sclerite not darker than the rest area. Pseudosutural fovea dark brown with light brown central area. Scutal lobe uniformly dark brown, dusted with yellowish gray. Area between lobes rusty brown. Spot extends onto scutellum making short stripe. Scutellum brown, mediotergite paler brown with indistinct dark medial line, both densely dusted with light gray. Pleuron grayish brown because of dense cover of gray pruinosity, darker brown dorsally, anepisternum slightly infuscated along dorsal and ventral margins. Wing grayish, subhyaline, yellowish in prearcular region, without dark brown pattern that is typical for most *Eloeophila* species. The most distinct spot is dark brown



oval stigma, indistinct grayish areas surround cord, distal margin of discal cell and cross-veins. Veins yellowish brown, yellowish at wing base and in costal area. Venation typical for the genus: radial sector angulate and short-spurred at base, *m-cu* at about one-fourth of discal cell's length. Cell *m*₁ long, 1.2 times as long as its stem. Anal vein nearly straight, just slightly arched at tip. It reaches wing margin slightly before the level of *Rs* base, supernumerary cross-vein in cell *bm* approximately at middle between base of *Rs* and tip of anal vein. Distal wing cells without macrotrichiae. Male wing narrow, not widened at posterior margin, widest at tip of vein *CuP*. Halter with pale yellow stem, knob pale at base, distal part slightly infuscate, brownish. Male halter 1.2–1.4 mm long, female 1.1–1.3 mm. Coxae yellow, just base of fore coxa slightly infuscated. Trochanters obscure yellow. Femur brownish yellow, paler at base, with widely darkened apex. Tibia and two basal tarsomeres brownish yellow with narrowly and indistinctly darkened apices. Remaining tarsomeres brown.

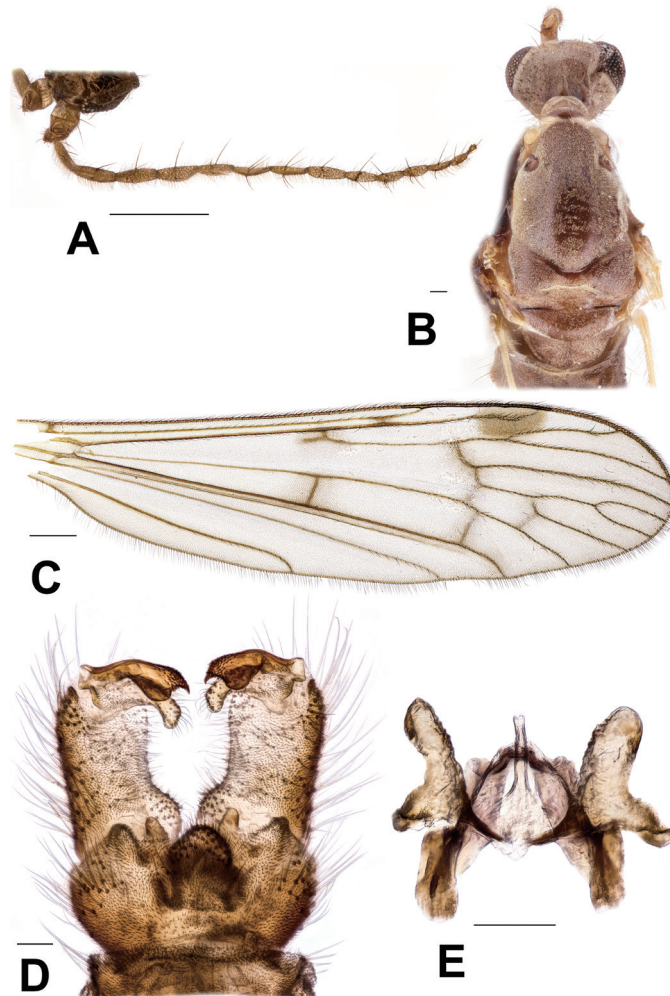


Fig. 72. *Eloephila shannoni* (Alexander, 1921) male. **A.** Antenna; **B.** Head and thorax, dorsal view; **C.** Wing; **D.** Genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A, C = 0.5 mm; B, D, E = 0.1 mm.



Claw black. Male femur I: 4.1–5.7 mm long, II: 4.2–5.5 mm, III: 5.7–6.4 mm, tibia I: 4.9–5.8 mm, II: 4.9–5.1 mm, III: 5.5–6.2 mm, tarsus I: 5.3–5.6 mm, II: 5.3 mm, III: 4.5–5.3 mm. **Abdomen.** Tergites dark brown with narrowly light gray posterior margins. Sternites paler medially. Male genitalia dark brown with reddish brown gonocoxites. Posterior margin of epandrium with three lobes, central lobe rounded and densely covered with blackish setae, lateral lobe triangle-shaped. Gonocoxite elongate, 1.6 times as long as widest part at base, basal part with rounded lobe on mesal surface. Outer gonostylus brown, elongate, basal half narrow, distal strongly enlarged, apex with strong spine, distal part serrate. Outer margin without crest, inner margin with large, rounded lobe at distal end. Inner gonostylus fleshy and setose, curved, basal part wide, distal narrow. Paramere with wide round-apexed mesal lobe lacking any setae, lateral lobe nearly as long as mesal, but narrower. Aedeagus straight and thin, not reaching apex of mesal process of paramere. Lateral projection of lower shelf small and rounded, mesal extended along aedeagus. Lateral apodeme wide, plate-shaped slightly elongate. Sperm pump (vesica) elongate, oval. Apodeme of vesica reduced.

ELEVATION. From 1000 m to 2100 m.

FLIGHT PERIOD. From end of June to late July.

HABITAT. Margins of creeks covered by grassy vegetation.

GENERAL DISTRIBUTION. USA (Colorado, Idaho, Oregon, Washington and Wyoming).

EXAMINED MATERIAL. One female (pinned), USA, Colorado, Kenosha, June 27, 1919 (ANSP); one male (pinned), USA, Colorado, Como, June 29, 1919 (ANSP); one male and one specimen of unclear sex (pinned), USA, Wyoming, Grand Tetons, altitude 2066 m (6780 ft), July 12, 1941, C.P. Alexander (USNM); three males, one female (pinned), USA, Wyoming, Grand Tetons, Leigh Lake, altitude 2095 m (6875 ft), July 12, 1941, C.P. Alexander (USNM); one male, two females (pinned), USA, Wyoming, Grand Tetons, Leigh Lake, altitude 2067 m (6780 ft), July 12, 1941, C.P. Alexander (USNM); one male (pinned), USA, Oregon, Mount Hood, Horsethief Meadows, July 18, 1947, C.P. Alexander (USNM); two males (pinned, genitalia of one male in microvial with glycerol on same pin), USA, Washington, Rainier, St. Andrews Creek, altitude 1158 m (3800 ft), July 27, 1953, C.P. Alexander (USNM).

67. *Eloeophila similissima* (Alexander, 1941) (Fig. 73)

Limnophila (*Elaeophila*) *similissima* Alexander, 1941b: 54–56;

Eloeophila similissima Oosterbroek, 2023.

DESCRIPTION. General. Body coloration gray with dark brown Abdomen. Male body length 5.5 mm, wing length 6.1–6.2 mm. **Head.** Brownish gray, occiput darker brown medially. Both basal antennomeres black, basal flagellomeres uniformly yellow, segments turning darker towards apex of antenna. Flagellomeres oval. Rostrum and palpus black. **Thorax.** Pronotum gray with median darker brown line. Prescutum and presutural scutum gray with dark brown longitudinal stripes, interspace between medial and lateral stripe with few small spots. Scutal lobe gray with two brown spots. Area between lobes with dark spot that extends onto scutellum making short longitudinal stripe. Scutellum gray with dark medial stripe. Mediotergite gray, darkened posteriorly and laterally. Pleuron gray with distinct irregular dark brown spots. Wing milkish, subhyaline, yellowish at base and along costal



margin, with distinct pattern of dark brown spots: irregular spot at arculus extending along vein *CuA*, transverse broken suture at base of *Rs* and supernumerary cross-vein in cell *bm*, large spot at branching point of *Rs* – tip of *R₁* and large spot at distal wing margin. Stigma dark brown. Abundant small dots evenly distributed through cells and along veins. Narrow brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins. Veins brownish, yellowish at wing base and costal area, darker brown in darkened areas. Venation typical for the genus: radial sector angulate at base, *m-cu* at middle of discal cell. Cell *m₁* long, twice as long as its stem. Anal vein nearly straight except arched distal part. It reaches wing margin distinctly beyond level of supernumerary cross-vein in cell *bm*, base of radial sector slightly before supernumerary cross-vein. Distal wing cells without macrotrichiae. Male wing strongly widened at posterior margin, widest slightly before tip of anal vein. Stem of halter dark brown with pale base and slightly brightened distal end, knob dark brown. Coxa gray, trochanter blackish. Femur yellow with broad dark brown subapical ring and reddish spot on outer face. Tibia yellow with narrowly and indistinctly darkened apex. Two basal tarsomeres yellow with indistinctly darkened apices, remaining tarsomeres brown.

Abdomen. Dark brown Male genitalia brown. Posterior margin of epandrium with wide but shallow concavity. Gonocoxite elongate, 1.3 times as long as widest part at base in slide-mounted holotype, distinctly narrower apically, without ventro-mesal lobe at base. Outer gonostylus long and narrow, nearly parallel-sided in dorsal view, with large claw-shaped apical spine, crest on outer margin low but extending into subapical spine. Lower margin smooth with small subbasal ridge, it makes blunt angle together with distal margin. Inner gonostylus pale, fleshy and setose, nearly parallel-sided, except narrower rounded apex. Paramere with long narrow and slightly arched mesal lobe, lateral lobe elongate, narrows towards apex. Aedeagus straight and long in dorsal view, narrower apically,

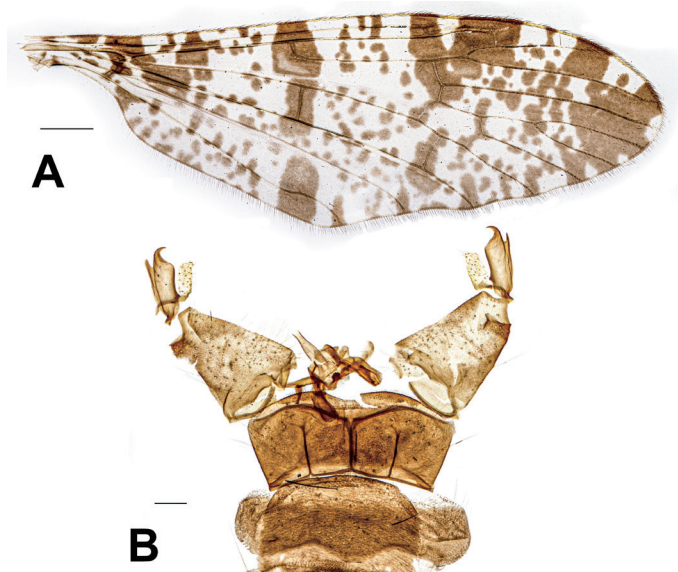


Fig. 73. *Eloeophila similissima* (Alexander, 1941) male, holotype. **A.** Wing; **B.** Genitalia, dorsal view. Scale bars: A = 0.5 mm; B = 0.1 mm.



extending far beyond apex of mesal process of paramere. Lateral projection of lower shelf small. Lateral apodeme elongate, wide, blade-shaped. Sperm pump (vesica) elongate, oval. Apodeme of vesica small, blackened and subglobular.

ELEVATION. Slightly above 900 m.

FLIGHT PERIOD. Beginning of June.

HABITAT. Unknown.

GENERAL DISTRIBUTION. China (Sichuan Province).

EXAMINED MATERIAL. Holotype, male (leg, wing and abdomen slide-mounted), W. China, Szechwan [Sichuan], Mount Omei, Flying Bridges, altitude 914 m (3000 ft), June 1, 1938, Franck (USNM).

68. *Eloeophila smithersi* (Alexander, 1958) (Figs. 74, Pl. 11D)

Limnophila (*Elaeophila*) *smithersi* Alexander, 1958a: 128–129; 1964: 359;

Eloeophila smithersi Oosterbroek, 2023.

DESCRIPTION. General. Body coloration dark brown to black. Male body length 5.1–6.5 mm, wing length 7.0–7.1 mm. **Head.** Dark brown, sparsely dusted with gray, vertex somewhat rusty brown anteriorly. Male antenna 3.6–4.3 mm long, reaching to about middle of abdomen if bent backwards. Scape dark brown, sparsely dusted with gray, elongate, nearly cylindrical, bearing few erect setae on dorsal surface. Pedicel cup-shaped, brown. Flagellomeres elongate, eight basal flagellomeres bicolored, dark brown basally, yellow apically, length of yellow area decreases towards apex. Distal flagellomeres entirely dark brown. Three basal flagellomeres each with single long seta at middle, it is about as long as half length of respective segment. Flagellum covered with dense erect whitish pubescence. Apical flagellomere small, preceding segment twice as long as apical. Rostrum and palpus dark brown to black. **Thorax.** Pronotum dark brown, dusted with yellowish gray. Prescutum and presutural scutum dark brown with four wide indistinct darker brown longitudinal stripes that are nearly confluent. Medial stripes separated by indistinct blackish line anteriorly. Posterior margin of sclerite yellowish. Pseudosutural fovea dark brown to black, surrounded by distinct brownish area. Lateral margin of sclerite concolorous with the presutural scutum. Scutal lobe dark brown with yellowish postero-lateral angle. Area between lobes yellowish. Scutellum dark brown anteriorly, yellowish along posterior margin. Mediotergite dark brown, densely dusted with light yellowish gray fronto-medially. Pleuron dark brown with few irregular paler areas. Wing grayish, subhyaline, slightly yellowish at base and along costal margin, patterned with six dark brown spots along frontal margin and large spot at supernumerary cross-vein in cell *bm*. Stigma not darker than surrounding spot. Indistinct grayish brown areas surround cord and distal margin of discal cell. Wing cells with numerous small grayish spots. Veins pale yellow, brown to dark brown in darkened areas. Venation typical for the genus: radial sector arcuate at base, *m-cu* at about three-fourth of discal cell's length. Cell *m₁* long, 1.3 times as long as its stem. Anal vein slightly sinuous. It reaches wing margin at the level of base of radial sector. Supernumerary cross-vein in cell *bm* beyond base of *Rs*. Distal wing cells without macrotrichiae. Male wing narrow, not widened at posterior margin, widest at tip of vein *CuP*. Male halter 1.0–1.3 mm long with brownish



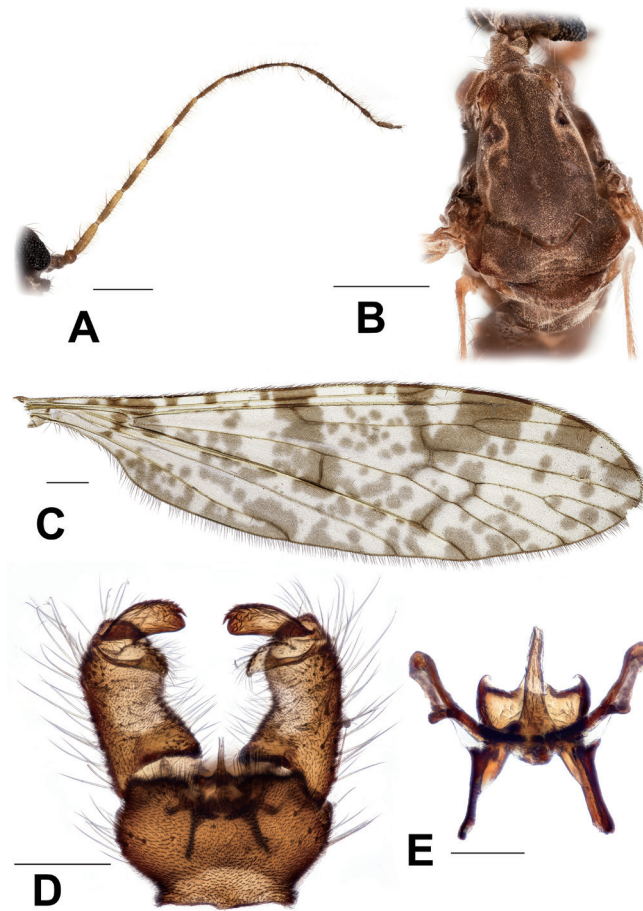


Fig. 74. *Eloeophila smithersi* (Alexander, 1958), male. **A.** Antenna; **B.** Thorax, dorsal view; **C.** Wing; **D.** Genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A-D = 0.5 mm; E = 0.1 mm.

yellow stem and dark brown knob. Coxa brownish black, trochanter obscure yellow with narrowly black distal margin. Femur obscure yellow with conspicuous black subterminal ring. Tibia and basal tarsomeres light yellow, distal tarsomeres brownish. **Abdomen.** Dark brown to black. Male genitalia with dark brown ninth segment and brown gonocoxites. Epandrium slightly extended posteriorly, posterior margin narrowly blackened, covered with dense short setulae, slightly sinuous, posterolateral corner right-angled. Gonocoxite elongate, 1.6 times as long as widest part at base, slightly arched, narrower towards apex, slightly expanded at base of ventro-mesal surface. Outer gonostylus elongate, slightly wider towards distal margin, with large subappressed apical spine, outer margin without crest, distinctly serrate at distal half, inner margin smooth, slightly arched, with large rounded subapical angle. Inner gonostylus fleshy and setose, narrower at tip, pale with about two-thirds of inner margin darkened. Paramere with long club-shaped mesal lobe lacking any setae, lateral lobe very short, round-apexed. Aedeagus long and narrow, extending slightly beyond apex of mesal process of paramere. Lateral projection of lower shelf extended into curved spine to about



same level as median projection. Lateral margin of lower shelf smooth. Lateral apodeme dark brown, long, straight and narrow. Sperm pump (vesica) subglobular. Apodeme of vesica directed ventrally, visible only as a dark rounded spot in dorsal view.

ELEVATION. Unknown.

FLIGHT PERIOD. From middle of December through to beginning of April.

HABITAT. Unknown. Species is attracted to light.

GENERAL DISTRIBUTION. Zimbabwe.

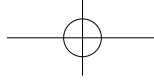
EXAMINED MATERIAL. Holotype, male (antenna, hind leg, wing and genitalia slide-mounted), South Rhodesia, Salisbury, April 5, 1956, Smithers (USNM); one male (pinned, wing slide-mounted), Zimbabwe, Inyanga Biological Station, December 9–10, 1985, in house, R. Payne-Smit (Naturalis, RMNH.INS. 1543985); one male (pinned), Zimbabwe, Inyanga Biological Station, January 3, 1986, in house, R. Payne-Smit (Naturalis, RMNH.INS. 1543986).

69. *Eloeophila solstitialis* (Alexander, 1926) (Fig. 75, Pl. 11E)

Linnophila (*Ephelia*) *solstitialis* Alexander, 1926a: 109–110; 1927c: 224; 1927b: 64; 1928: 58;
Linnophila (*Elaeophila*) *solstitialis* Alexander, 1940b: 632; 1941a: 304; 1943b: 386–387; Byers, 2002: 22; Petersen, 2003: 94;
Linnophila solstitialis Blech and Rohlfien, 1987: 256;
Linnophila (*Eloeophila*) *solstitialis* Harper and Lauzon, 1985: 19; Young and Gelhaus, 2000: 18, 24, 34, 57, 86, 88, 93, 97, 107, 127, 136, 150, 201;
Eloeophila solstitialis Petersen et al., 2005: 7; Gathmann and Williams, 2006: 148; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration dark brown, gray pruinose with distinct grayish areas on thorax and yellowish spots on abdomen. Male body length 3.2–5.9 mm, female 5.4–8.1 mm, male wing length 5.1–7.0 mm, female 6.5–7.5 mm. **Head.** Dark brown, yellowish frontally and along eye margin, covered with sparse brown setae. Male antenna 0.9–1.3 mm long, nearly reaching base of wing if bent backwards. Female antenna 1.1–1.3 mm long. Scape elongate, nearly cylindrical, dark brown, sparsely covered with gray pruinosity, 2.5 times as long as pedicel. Pedicel dark brown, subglobular, bearing few strong setae. Flagellum yellowish brown basally, dark brown distally. 3–4 basal flagellomeres oval, remaining segments elongate. Longest verticils 2.3 times as long as respective flagellomeres. Five basal flagellar segments covered with sparse whitish pubescence on ventral side. Rostrum brown. Palpus dark brown. **Thorax.** Pronotum light gray with dark brown median line. Postpronotum whitish gray. Prescutum and presutural scutum yellowish-brownish gray with four distinct dark brown longitudinal stripes. Medial stripes forming extended “V”-shaped pattern with posterior ends narrowly confluent, reaching posterior margin of sclerite only as narrow vitta. Medial stripe with short lateral branch at middle, reaching anterior end of short lateral stripe. Lateral margin of sclerite darkened, posterior margin with two small dark spots right before suture. Scutal lobe concolorous with prescutum, with large dark brown spot in the middle. Area between lobes concolorous with scutal lobe anteriorly, dark brown posteriorly. Pseudosutural fovea distinct, dark brown or black, surrounded by yellowish area. Scutellum brown with indistinct





darker brown medial line and grayish posterior margin. Mediotergite grayish brown with indistinct darker brown medial line. Pleuron light brownish gray with broken dark brown longitudinal stripe. Dorsopleural membrane yellowish brown to orange brown. Wing grayish or brownish, subhyaline, yellowish at base, patterned with seven dark brown rectangular spots along frontal margin. Spots distinctly narrower than interspaces. Female wing pattern more distinct than that of male. Stigma dark brown. Grayish brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins. Small spots surround vein tips at posterior wing margin. Veins dark brown, yellowish at wing base and costal area. Venation typical for the genus, radial sector angulate and short-spurred at base, *m-cu* close to the base of discal cell, at about one-fifths of its length. Cell m_1 long, 1.3 times as long as its stem. Anal vein slightly sinuous. It reaches wing margin distinctly beyond level of supernumerary cross-vein in cell *bm*, base of radial sector before supernumerary cross-vein. Distal wing cells without macrotrichiae. Male wing narrow, not widened at posterior margin, widest slightly beyond tip of anal vein. Male halter 0.9–1.1 mm long with pale yellow stem, slightly darker base and distinctly dark brown knob. Female halter 0.9–1.1 mm long. Coxae light brown, fore coxa slightly yellowish frontally. Trochanters light brown, posterior pair slightly darker. Femur yellow to brownish yellow with dark brown apical ring. Tibia brownish yellow with narrowly darkened apex. Basal tarsomere yellow at base, turning brown towards apex. Remaining tarsomeres brown to darker brown. Claw dark brown. Male femur I: 4.1–4.9 mm long, II: 4.7–4.8 mm, III: 4.3–5.9 mm, tibia I: 4.1–5.0 mm, II: 4.2–4.5 mm, III: 3.7–4.9 mm, tarsus I: 3.7–4.6 mm, II: 3.7–3.9 mm, III: 2.0–4.3 mm. Female femur I: 4.6–5.0 mm long, II: 5.1–5.2 mm, III: 4.8–5.5 mm, tibia I: 4.4–5.0 mm, II: 4.3–4.7 mm, III: 4.4–4.8 mm, tarsus I: 3.9 mm, II: 3.7–3.9 mm, III: 3.0–3.8 mm. **Abdomen.** Three basal tergites brown at basal half, dark brown at distal, tergites fourth to seventh yellowish brown with widely dark brown posterior margin. Three basal sternites light grayish brown, widely dark brown at posterior margin, sternites fourth to seventh yellow with widely dark brown posterior margin. Pregenital segment dark brown. Male genitalia brown. Posterior margin of epandrium widely rounded without emargination. Gonocoxite elongate, 1.9 times as long as widest part at base, narrows apically. Outer gonostylus long and slender, distal part narrower and split at tip into two short diverging teeth; outer margin with crest that extends into acute or subacute tooth at four-fifths length of gonostylus; inner margin right-angled at about two-thirds length of gonostylus. Inner gonostylus pale brown with dark brown inner margin, widens distally, fleshy and setose, each seta starting from prominent bump especially distinct on outer and distal margins of stylus. Paramere with long mesal club-shaped lobe lacking any setae, lateral lobe short, spine-shaped at apex. Aedeagus straight in dorsal view, extending beyond apex of mesal process of paramere, bifid at apex. Lateral projection of lower shelf spine-shaped, parallel to aedeagus. Lateral margin of lower shelf smooth, not extended, mesal part membranous, extending along aedeagus. Lateral apodeme elongate, slightly narrows towards apex. Apodeme of vesica directed ventrally and visible only as darkened rim in dorsal view. Sperm pump (vesica) oval.

ELEVATION. From sea level to nearly 1200 m.

FLIGHT PERIOD. From beginning of May through to end of August.

HABITAT. Margins of small streams.

GENERAL DISTRIBUTION. Canada (Ontario, Quebec), USA (Florida, Maine, Massachusetts, Michigan, North Carolina, Pennsylvania, Tennessee, Vermont).

EXAMINED MATERIAL. Two males (pinned, genitalia of one male in microvial with



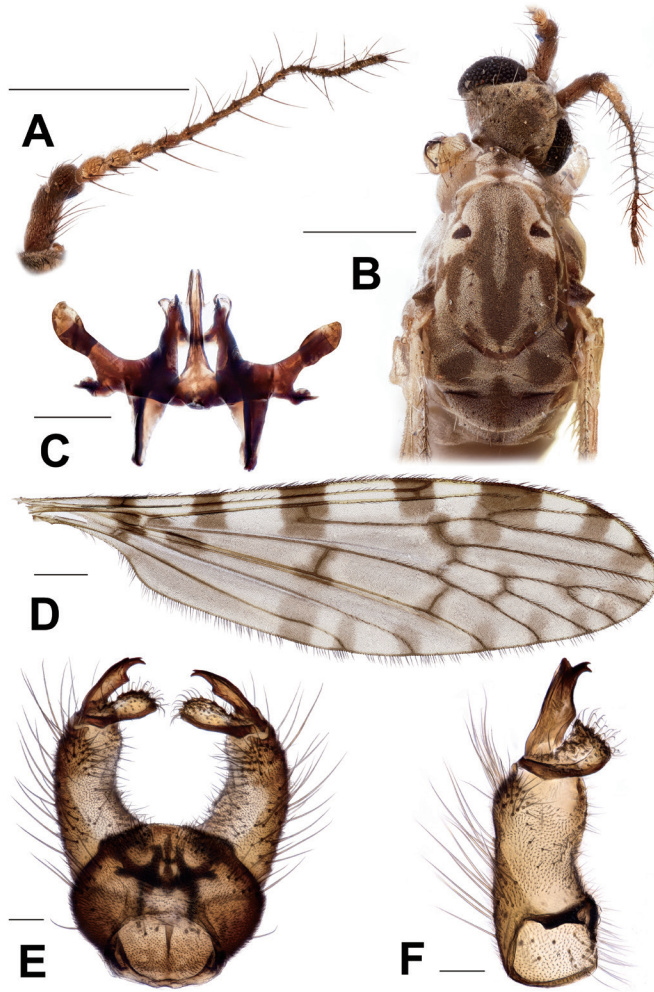
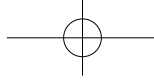


Fig. 75. *Eloeophila solstitialis* (Alexander, 1926), male. **A.** Antenna; **B.** Head and thorax, dorsal view; **C.** Aedeagal complex, dorsal view; **D.** Wing; **E.** Genitalia, dorsal view; **F.** Gonocoxite with gonostyli, fronto-dorsal view. Scale bars: A, B, D = 0.5 mm; C, E, F = 0.1 mm.

glycerol on same pin), USA, Virginia, Shenandoah, Big Meadows, 1 J1.39, A.L. Melander (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Virginia, Great Falls, August 11, 1915, W.L. McAtee (USNM); one male and one specimen of unclear sex (pinned, male genitalia in microvial with glycerol on same pin), USA, New York, Cortland Co., Cincinnatus, July 20, 1916, C.P. Alexander (USNM); one male and one specimen with unclear sex (pinned), USA, Massachusetts, Amherst, August 1928, F. Edwards, B.M. 1928-407 (NHMUK 013435922, 013435923); one male (pinned, genitalia in microvial with glycerol on same pin), USA, North Carolina, Mt. Mitchell, Game Refuge, altitude 975 m (3200 ft), June 22, 1939, C.P. Alexander (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), USA, Tennessee, Greenbrier, Smoky Mountains, altitude 512 m (1680 ft), June 24, 1940, C.P. Alexander (USNM); two females (pinned), USA, North Carolina, Smokemont, altitude 671 m (2200 ft), June 30, 1940,





C.P. Alexander (USNM); one female and one specimen with unclear sex (pinned), USA, Vermont, lake Willoughby, altitude 366 m (1200 ft), June 23, 1945, C.P. Alexander (USNM); one female (pinned), USA, North Carolina, Pisgah National Forest, White Pines Campground, tributary of Donaldson River, altitude 670 m (2200 ft), July 26, 1956, J. F. Hanson (USNM); two males, three females (pinned), USA, PA, Chester Co., Valley Forge National. Hist. Pk., Sterling's Run, Mt. Misery, 40°05'N, 75°28'W, altitude ±75 m, July 21, 1995, J. Gelhaus #667, J. Ruffin (ANSP); one male (pinned), USA, Pennsylvania, Cumberland Co., Grandham, Tributary to Stoney Run, June 6, 1998, C. Ridge, J. Gelhaus (ANSP, specimen record #6124); one male (pinned), USA, Pennsylvania, Philadelphia Co., Fairmount Park [Pennypack section], E of Tabor Ave. near RR, ±40°04'20"N, 75°04'1"W, altitude ±30 m, marshy area, aerial net, July 23, 1998, R.W. Bouchard, Jr. (ANSP); one female (pinned), USA, PA, Chester Co., Valley Forge Natl. Hist. Pk., Stirling's Run, altitude ~85 m, N40.08656°, W75.42522°, Woodland, stream and springs (Trap site area VAFO #2), June 24, 2014, J. Gelhaus #1551, L. Henderson (ANSP); one male (pinned), USA, PA, Philadelphia County, Boxer's Trail, near Randolph Dr, East Fairmount Park, altitude 30–40 m, N39.98923°, W-75.19376°, May 2, 2017, D. Kato (ANSP); nine males, three females (pinned), USA, PA, Philadelphia County, Boxer's Trail, near Randolph Dr, East Fairmount Park, altitude 30–40 m, N39.98923°, W-75.19376°, May 26, 2017, D. Kato (ANSP); three females (pinned), USA, PA, Philadelphia County, Boxer's Trail, near Randolph Dr, East Fairmount Park, altitude 30–40 m, N39.98923°, W-75.19376°, June 2, 2017, D. Kato (ANSP); two females (pinned), USA, PA, Philadelphia County, Boxer's Trail, near Randolph Dr, East Fairmount Park, altitude 30–40 m, N39.98923°, W-75.19376°, June 9, 2017, D. Kato (ANSP); two males (pinned), USA, PA, Philadelphia County, Wissahickon Valley Park, Wissahickon Creek or small streams from it, altitude 30–66 m, N40.034–052°, W-75.200–217°, June 12, 2017, D. Kato (ANSP); two males, one female (pinned), USA, PA, Philadelphia County, Wissahickon Valley Park, Wissahickon Creek or small streams from it, altitude 30–66 m, N40.034–052°, W-75.200–217°, July 15, 2017, D. Kato (ANSP); one male (pinned), USA, PA, Philadelphia County, Wissahickon Valley Park, Wissahickon Creek or small streams from it, altitude 30–66 m, N40.034–052°, W-75.200–217°, August 28, 2017, D. Kato (ANSP).

REMARK. Type in Deutsches Entomologisches Institut (Blech and Rohlfien, 1987).

70. *Eloeophila sparsipunctum* Starý, 2009a (Fig. 76, Pl. 11F)

Eloeophila sparsipunctum Starý, 2009a: 437–438; Hubenov, 2018: 15; 2021: 30; Kolcsar et al., 2021: 93–94; Oosterbroek, 2023.

DESCRIPTION. General. Body dark brown, abdominal sternites weakly bicolored. Male body length 8.4 mm, wing length 7.0–9.4 mm. **Head.** Dark brown, densely dusted with gray, light gray along eye margin, vertex with distinct dark brown medial line, covered with sparse dark brown setae. Male antenna 1.4–1.8 mm long, reaching wing base if bent backwards. Scape elongate, nearly cylindrical, entirely dark brown, sparsely covered with yellowish gray pruinosity. Pedicel subglobular, dark brown with paler distal margin, bearing few strong setae. Basal half of flagellum obscure yellow, distal half brown. Five basal flagellomeres oval, covered with dense whitish pubescence on ventral side, remaining segments elongate. Three basal segments distinctly widened



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ventrally. Apical flagellomere large, subequal to preceding segment. Longest verticils 1.8 times as long as respective flagellomere. Rostrum brown with few dark brown apical setae. Palpus and mouth parts black. **Thorax.** Pronotum dark brown with dense cover of brownish gray pruinosity, with distinct dark brown medial line. Postpronotum dark brown. Prescutum and presutural scutum brown with dense cover of pruinosity, yellowish anteriorly, grayish posteriorly, with four rather distinct dark brown longitudinal stripes. Medial stripes starting at anterior margin of sclerite but far not reaching suture caudally. Area separating medial stripes slightly narrower than stripe itself, with indistinct broken line along middle, more distinct posteriorly. Lateral stripe arched, interspace with row of dark dots. Lateral margin of sclerite slightly infuscate. Dorsopleural membrane yellowish brown. Scutal lobe brownish gray, with longitudinal dark brown slightly arched line closer to medial margin. Area between lobes light gray with distinct dark brown medial stripe extending onto scutellum. Pseudosutural fovea distinct, dark brown, oblique, surrounded by yellowish area. Scutellum and mediotergite light brownish gray, both with dark medial line, or anterior spot on scutellum and posterior on mediotergite, depending on specimen. Pleuron dark brown with irregular paler areas. Wing grayish, subhyaline, yellowish at base and along costal area, patterned with seven dark brown spots along frontal margin. Stigma dark grayish brown, slightly darker than surrounding dark spot. Grayish brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins. Small spots surround vein tips at posterior wing margin, small spots or dots distributed only along veins but not in cells, cells beyond R slightly infuscate along middle, but clear along margins. Veins pale yellow, darker grayish brown in darkened areas. Venation typical for the genus, radial sector arcuate at base, *m-cu* at middle of discal cell. Cell m_1 long, 1.6 times as long as its stem. Anal vein nearly straight with arched and short-spurred distal part. It reaches wing margin distinctly beyond level of supernumerary cross-vein in cell *bm*, which is far beyond base of radial sector. Distal wing cells with macrotrichiae. Male wing slightly enlarged at posterior margin, widest at or slightly beyond tip of anal vein. Stem of halter brownish pale with rusty brown base, knob dark brown or black, paler at base. Male halter 1.0–1.2 mm long. Coxa dark brown dorsally, paler brown ventrally, trochanter brown. Femur brownish yellow with dark brown apical ring. Apical darkening subequal on all femora. Tibia obscure yellow with indistinctly and narrowly darkened apex. Two or three basal tarsomeres brownish yellow with indistinctly darkened apices, remaining tarsomeres brown to dark brown. Claw black. Male femur I: 5.9–6.4 mm long, II: 6.6–6.9 mm, III: 7.0 mm, tibia I: 5.3–6.6 mm, II: 6.0–6.3 mm, III: 7.0 mm, tarsus I: 4.7–5.6 mm, II: 5.2 mm, III: 4.6 mm. **Abdomen.** Tergites dark brown with widely blackened posterior margins, sternites yellowish brown at basal half, dark brown or black at posterior. Basal segment entirely dark brown, slightly dusted with gray. Male genitalia with dark brown ninth segment and paler brown gonocoxites. Epandrium slightly extended posteriorly, posterior margin nearly straight, narrowly blackened and covered with short dense setulae, with low blunt angle laterally. Gonocoxite elongate, 2.2 times as long as widest part at base, slightly arched, base of ventro-mesal area slightly enlarged and armed with three small spines. Outer gonostylus flat and elongate, slightly arched, with small terminal spine; outer margin with low rounded crest and serrate distal part; inner margin nearly smooth, slightly arched, with moderately pronounced rounded subapical angle. Mesal lobe of paramere wide and flat, blunt-apexed and setose, lateral lobe short and blackened. Lateral projection of lower shelf slightly raised, rounded, mesal projection membranous, extending along aedeagus, which is straight and medium-long in dorsal view, extending beyond apex of mesal process of paramere. Lateral apodeme elongate,



slightly sinuous, blackened, slightly narrows towards apex. Sperm pump (vesica) oval, apodeme of vesica elongate, peg-shaped.

ELEVATION. Slightly above 1200 m.

FLIGHT PERIOD. From early May through to end of June.

HABITAT. Tree covered margins of streams.

GENERAL DISTRIBUTION. Bulgaria, Romania.

EXAMINED MATERIAL. Paratype, one male (pinned), Bulgaria, Lilianovo near Sandanski, June 17, 1990, J. Starý (NRC); two males (pinned), Romania, Cibinului Mountains below Paltinis, altitude about 1219 m (c. 4000 ft), June 24–25, 1969, stream through wooded valley, B.M. 1970–152, B.H. & M.C. Cogan, T.I. & R. Vane-Wright (BMNH).

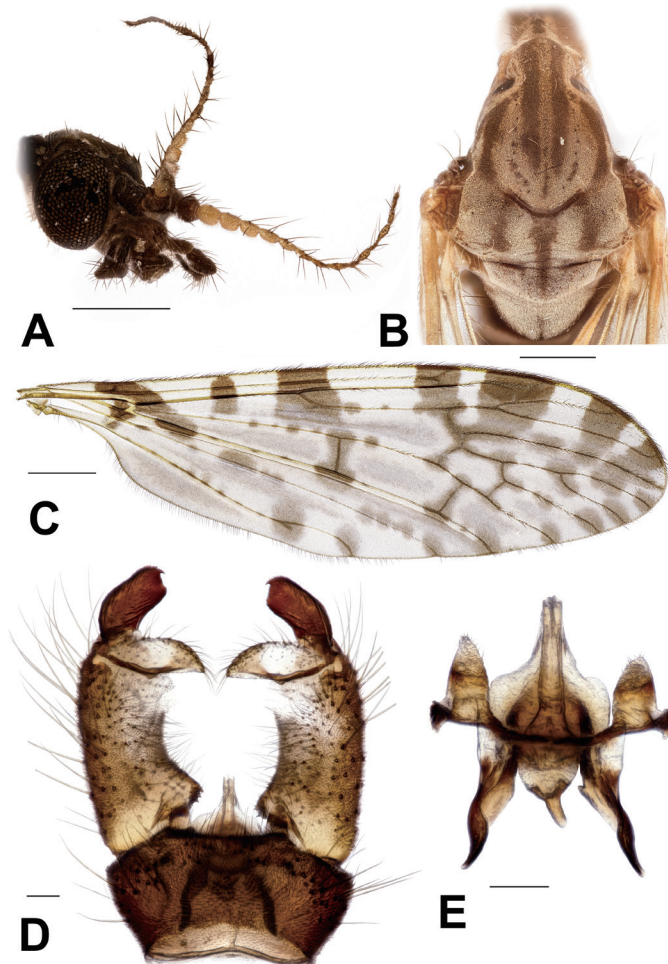


Fig. 76. *Eloeophila sparsipunctum* Starý, 2009a, male. **A.** Head, lateral view; **B.** Thorax, dorsal view; **C.** Wing; **D.** Genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A, B = 0.5 mm; C = 1.0 mm; D, E = 0.1 mm.



71. *Eloeophila subannulata* (Alexander, 1946) (Fig. 77)

Limnophila (*Elaeophila*) *subannulata* Alexander, 1946b: 137–138; 1964: 360;
Eloeophila subannulata Oosterbroek, 2023.

DESCRIPTION. General. Body coloration gray with brownish black Abdomen. Wing length (sex unknown, probably male) 7.0 mm. **Head.** Broken in holotype. **Thorax.** Prescutum and presutural scutum gray with four indistinct brown longitudinal stripes. Medial stripe reduced into separate spots, lateral stripe more conspicuous, starting beyond pseudosutural fovea. Lateral margin of sclerite darker brown beyond pseudosutural fovea. Pleuron gray with two dark brown longitudinal stripes. Dorsal stripe extends from cervical sclerites towards base of abdomen, reaching lateral margin of mediotergite. Ventral stripe narrower, extends from base of fore coxa beneath halter. Katepisternum dark brown. Dorsopleural membrane pale. Wing yellowish, subhyaline, patterned with six dark brown spots along frontal margin. Spots, except at tip of R_1 , distinctly narrower than interspaces. Stigma darker brown. Narrow brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins. Small spots surround vein tips at posterior wing margin, grayish brown dots evenly distributed in cells and along veins. Veins brownish yellow, yellow at wing base and in costal area. Venation typical for the genus, radial sector angulate and short-spurred at base, $m-cu$ close to the base of discal cell, at about one-fifths of its length. Cell m_1 long, 1.5 times as long as its stem. Anal vein strongly arched distally, it reaches wing margin approximately at the level of R_s base. Supernumerary cross-vein in cell bm , distinctly before base of radial sector and before tip of anal vein. Distal wing cells without macrotrichiae. Wing widened at posterior margin, widest at tip of anal vein, what is common in males of many *Eloeophila* species. Halter dark brown with pale base of stem. Coxa dark brown with light brownish gray distal part. Trochanter obscure yellow with darker ventral portion. Femur light yellow with narrow pale brown subterminal ring and pale apex. Tibia and tarsus yellow, tibial spurs black and conspicuous. Legs covered with long pale but distinct setae. Femur (sex unknown) I: 3.9 mm long, tibia I: 4.6 mm, tarsus I: 4.2 mm. **Abdomen.** Dark brown. Distal part broken in holotype.

ELEVATION. Unknown.

FLIGHT PERIOD. March.

HABITAT. Among long grass at stream margin on edge of forest (Cuthbertson after Alexander, 1964).

GENERAL DISTRIBUTION. Zimbabwe.

EXAMINED MATERIAL. Holotype, sex unknown, probably male (foreleg and wing slide-mounted), Zimbabwe [South Rhodesia], Vumba Mountains, March 1935, Cuthbertson, No. 2397 (USNM).

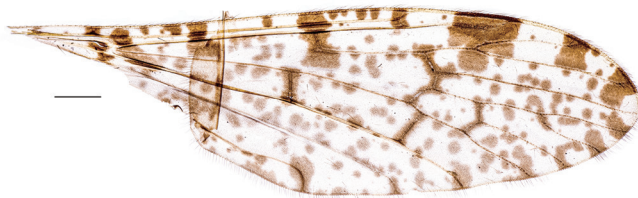
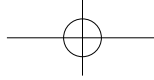


Fig. 77. *Eloeophila subannulata* (Alexander, 1946), wing, sex unknown, holotype. Scale bar: 0.5 mm.





72. *Eloeophila subaprilina* (Alexander, 1919) (Fig. 78, Pl. 12A)

Limnophila (*Ephelia*) *subaprilina* Alexander, 1919c: 340;

Limnophila (*Ephelia*) *subaprilina yezoensis* Alexander, 1924: 72;

Limnophila (*Elaeophila*) *subaprilina* Alexander, 1953: 167;

Eloeophila (*Eloeophila*) *subaprilina yezoensis* Savchenko, Krivolutskaya, 1976: 61;

Eloeophila subaprilina yezoensis Nakamura, 2014: 12;

Eloeophila yezoensis Podenas et al., 2020: 523–524;

Eloeophila subaprilina Nakamura, 2014: 12; Podenas et al., 2020: 519–521, Kato, 2021: 442–444; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration brown. Male body length 4.2–5.6 mm, wing length 5.7–7.3 mm. Female body length 6.0–8.1 mm, wing length 6.2–8.7 mm. **Head.** Brown, densely dusted with gray, narrowly light gray to yellowish gray along eye margin, covered with sparse short erect brown setae. Vertex with indistinct tubercle marked with darker line along middle. Eyes widely separated in both sexes, distance between them at bases of antennae approximately same as length of both basal antennomeres taken together. Male antenna 1.1–1.8 mm long, reaching to about middle of prescutum if bent backward. Female antenna 1.1–1.6 mm long. Scape dark brown, densely dusted with gray, elongate, nearly cylindrical, twice as long as pedicel. Pedicel brown, widened distally. Three basal flagellomeres slightly dilated ventrally, pale brown. Remaining flagellomeres darkened, elongate, narrower towards apex of antenna, covered with dense whitish pubescence. Apical segment subequal in length to preceding. Verticils dark brown, longest 2.0–2.5 times as long as respective segments. Rostrum brown, dusted with gray, palpus dark brown to blackish, labella brown. **Thorax.** Cervical sclerites and pronotum brown, dusted with brownish gray. Mesonotal prescutum dark brown, dusted with gray and covered with four longitudinal stripes. Median stripe broken at middle, lateral with transverse line frontally, resembling “T”-shaped structure. Tubercular pits indistinct at frontal margin of sclerite, pseudosutural fovea distinct, polished brown. Scutal lobe brown, densely dusted with brownish gray and with darker spot at middle. Area between lobes brownish gray, frontal margin narrowly polished brown. Scutellum brownish gray, yellowish along posterior margin. Mediotergite brown, grayish pruinosity denser frontally. Mesopleural membrane yellowish. Pleuron brown, dusted with brownish gray. Wing iridescent with brownish tinge, yellowish at base. Stigma distinct, dark brown, elongate. Brown spots at base of wing, along frontal margin, surrounding branching points of veins and cross-veins and at tips of all longitudinal veins along wing margin. Veins brownish yellow, darker in darkened areas, yellowish at wing base. Venation: *Sc* long, reaching wing margin slightly before branching point of *Rs*, *sc-r* four–five times its own length before tip of *Sc*. *Rs* long, arched at base. Free end of *R*₁ short, nearly longitudinal, *R*₂ indistinct, at the middle between tip of *R*₁ and branching point of *R*₂₊₃ and *R*₄. *R*₃ and *R*₄ diverging, cell *r*₃ with long stem, which is as long as stem of *m*₁. Cross-vein *r-m* distinct, slightly beyond base of discal cell. Discal cell 2.5 times as long as wide. Cross-vein *m-cu* slightly before middle of discal cell. Additional cross-vein in cell *bm* at the middle between base of *Rs* and tip of anal vein. Anal vein sinuous. Anal angle wide, posterior margin widely rounded. Halter with pale stem, yellowish at base, knob light brown. Length of male halter 0.7–1.0 mm, that of female 0.8–1.1 mm. Coxae brown, dusted with gray. Trochanters brown to yellowish brown. Femur yellow, distal part widely



dark brown. Tibia yellow with narrowly brown apex. Basal tarsomere yellow with brownish distal part, remainder of tarsus brown to dark brown. Tibia of foreleg with single apical spur, tibiae of middle and hind pairs of legs with two apical spurs each. Male femur I: 3.7–4.5 mm long, II: 4.3–4.9 mm, III: 4.2–5.5 mm, tibia I: 4.5–5.2 mm, II: 4.2–4.8 mm, III: 4.0–5.7 mm, tarsus I: 3.8–4.7 mm, II: 3.3–4.0 mm, III: 3.1–4.2 mm. Female femur I: 4.0–5.5 mm long, II: 4.5–4.8 mm, III: 4.4–5.2 mm, tibia I: 4.5–5.7 mm, II: 4.0–4.5 mm, III: 4.4–4.5 mm, tarsus I: 4.0–5.3 mm, II: 4.0–4.2 mm, III: 3.2–3.7 mm. Claw simple, without spines. **Abdomen.** Tergites reddish yellow with widely dark brown or blackish posterior and lateral margins, covered with sparse yellowish erect setae. Sternites obscure yellow, with widely dark brown or blackish posterior and lateral margins, covered with sparse yellowish erect setae. Male terminalia light brown. Epandrium wider than longer, posterior margin widely concave at middle, blackened, covered with dense short setulae. Gonocoxite elongate, 1.8 times as long as widest part at base, slightly narrower at middle. Outer gonostylus sclerotized, blade-shaped, with small apical spine, outer margin with low crest that extends into subapical spine, inner margin smooth with rounded subapical angle. Inner gonostylus elongate, fleshy and setose, pale with darkened inner margin. Mesal lobe of paramere elongate, slightly arched, blunt-apexed, setoseless, lateral lobe short, comparatively wide, spine-apexed. Lateral projection of lower shelf not produced, aedeagus straight, widened towards apex, elongate, extending slightly beyond apex of mesal process of paramere. Lateral apodeme elongate, arched, dark brown to black, blunt-apexed. Sperm pump (vesica) subglobular, apodeme of vesica turned ventrally, visible only as a dark elongate spot in dorsal view. Ovipositor brownish-grayish yellow. Cercus long and narrow, nearly straight, blunt-apexed. Hypoalva long and straight, point-apexed, reaching slightly beyond middle of cercus. Spermatheca oval.

ELEVATION. From less than 50 m to nearly 2000 m.

FLIGHT PERIOD. Adults are active from middle of April to early October.

HABITAT. Margins of small and medium-sized mountainous streams surrounded by mixed forest, small springs surrounded by willows and grassy vegetation in mountainous areas, wet surface of rocks covered with algae. Species is attracted to light.

GENERAL DISTRIBUTION. Far East of Russia, Japan, North and South Korea.

EXAMINED MATERIAL. Holotype (as *Limnophila (Ephelia) subaprilina yezoensis*), female (wing slide-mounted), Japan, Jozankei [Ishikari-no-kuni], altitude 305 m (1000 ft), August 16, 1923, T. Esaki (USNM); paratype (as *Limnophila (Ephelia) subaprilina*), male (wing and genitalia slide-mounted), Japan, Meguro, Tokyo, April 20, 1919, R. Takahashi (USNM); one male (pinned), Japan, Tsushima, Kashine, May 28, 1930, Esaki & Fujino (ANSP); one male (pinned, genitalia in microvial with glycerol on same pin), Japan, Sapporo, June 24, 1932, M. Okada (USNM); one male (pinned, genitalia in microvial with glycerol on same pin), Japan, Kyushu, Beppu, April 14, 1937, Suenson (USNM); one female (pinned), [N.] Korea, Seren, altitude 914 m (3000 ft), June 29–30, 1938, A.M. Yankovsky (USNM); metatype (as *Limnophila (Elaeophila) subaprilina yezoensis*), male (wing and genitalia slide-mounted), N. Korea, Seren Mts., altitude 610 m (2000 ft), August 8, 1938, A.M. Yankovsky (USNM); two males, three females (pinned), North Korea, Seren Mts., altitude 610 m (2000 ft), August 17, 1938, A.M. Yankovsky (USNM); three males (pinned), [N.] Korea, Seren, altitude 610–762 m (2000–2500 ft), August 17–18, 1938, A.M. Yankovsky (USNM); one male, one female (pinned), [N.] Korea, Seren, altitude 610–762 m (2000–2500 ft), August 21–22, 1938, A.M. Yankovsky (USNM); one male (pinned, genitalia in microvial with glycerol), N. Korea, Chonsani,



altitude 1219 m (4000 ft), April 29, 1940, A.M. Yankovsky (USNM); two males (pinned), N. Korea, Chonsani, altitude 1067 m (3500 ft), July 2, 1940, A.M. Yankovsky (USNM); two males (pinned), N. Korea, Chonsani, altitude 1219 m (4000 ft), July 4, 1940, A.M. Yankovsky (USNM); two males (pinned), N. Korea, Pontani Paiktusan, altitude 1829 m (6000 ft), July 26, 1940, A.M. Yankovsky (USNM); two males (pinned), N. Korea, Pontani Paiktusan, altitude 1890 m (6200 ft), July 29, 1940, A.M. Yankovsky (USNM); two males (pinned), N. Korea, Pontani Paiktusan, altitude 1676 m (5500 ft), July 31, 1940, A.M. Yankovsky (USNM); three males (pinned), N. Korea, Pontani Paiktusan, altitude 1890 m (6200 ft), July 31, 1940, A.M. Yankovsky (USNM); one male, one specimen with broken abdomen (pinned), N. Korea, Pontani Paiktusan, altitude 1829 m (6000 ft), July 31, 1940, A.M. Yankovsky (USNM); two males, two females (pinned), N. Korea, Pontani Paiktusan, altitude 1524–1859 m (5000–6100 ft), July 31, 1940, A.M. Yankovsky (USNM); one male (pinned), N. Korea, Pontani Paiktusan, altitude 1676–1920 m (5500–6300 ft), August 1, 1940, A.M. Yankovsky

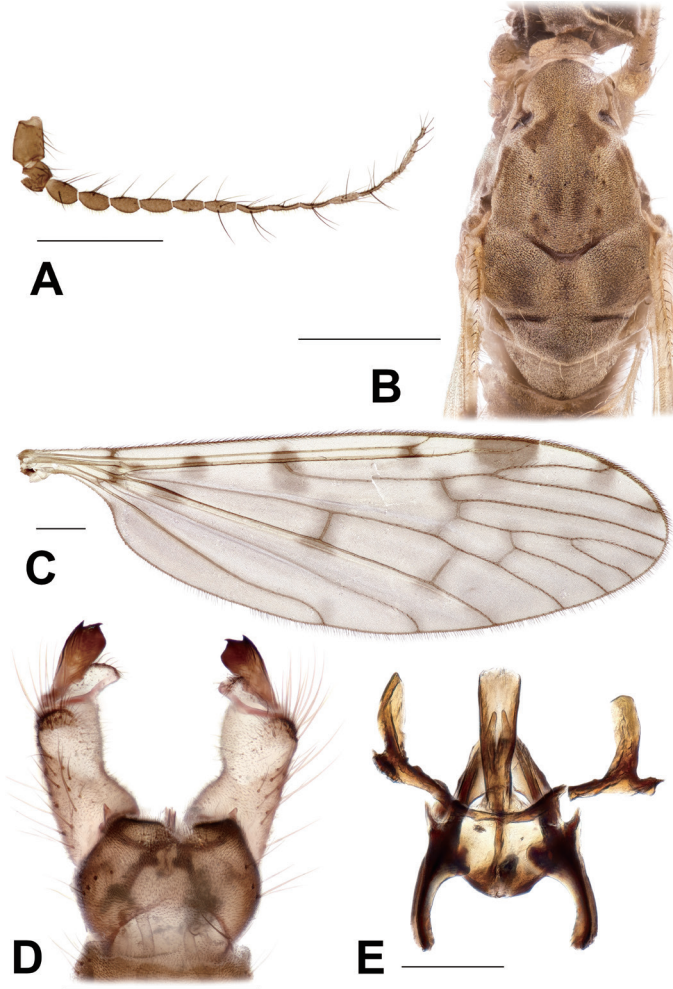


Fig. 78. *Eloeophila subaprilina* (Alexander, 1919), male. **A.** Antenna; **B.** Thorax, dorsal view; **C.** Wing; **D.** Genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A-D = 0.5 mm; E = 0.1 mm.



(USNM); one male (pinned), N. Korea, Pontani Paiktusan, altitude 1920 m (6300 ft), August 1, 1940, A.M. Yankovsky (USNM); two males (pinned), N. Korea, Pontani Paiktusan, altitude 1829 m (6000 ft), August 2, 1940, A.M. Yankovsky (USNM); two males (pinned), N. Korea, Pontani Paiktusan, altitude 1829 m (6000 ft), August 4, 1940, A.M. Yankovsky (USNM); one male (pinned), N. Korea, Pontani Paiktusan, altitude 1890 m (6200 ft), August 6, 1940, A.M. Yankovsky (USNM); two males (pinned), N. Korea, Pontani Paiktusan, altitude 1942 m (6370 ft), August 6, 1940, A.M. Yankovsky (USNM); two males, two females (pinned), S. Korea, #6, Hwy. #13, 6 mi. E of Seoul, 1 mi. W. Han River, altitude 46 m (150 ft), June 20, 1954, G.W. Byers (USNM, SMEK); one female (pinned), S. Korea, #27, Hwy. #13, 6 mi. E of Seoul, 1 mi. W. Han River, altitude 46 m (150 ft), August 19, 1954, G.W. Byers (SMEK); one male, one female (pinned), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27177°, E127.57146°, altitude 490 m, June 28, 2015 (1,2), S. Podenas (NIBR); one male (pinned), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27448°, E127.56378°, altitude 593 m, July 1, 2015 (1), S. Podenas (NIBR); one male, one female (in ethanol), S. Korea, Gangwon-do, Yangyang, Seo-myeon, Osaek-ri, Heullim 1 gyo (bridge), Seoraksan NP, N38.09512°, E128.41309°, altitude 800 m, July 7, 2015 (3), S. Kim, S. Podenas (NIBR); one male (pinned), Japan, Fukuoka, Sawara-ku, Fukuoka-shi, Mountain Sefuri, Itaya, July 24, 2015, D. Kato (NRC); one female (pinned), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.26590°, E127.58096°, altitude 446 m, June 2, 2016, S. Podenas, at light (NIBR); one male (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.27333°, E127.56924°, altitude 546 m, June 3, 2016 (3), S. Podenas (NIBR); one specimen with broken abdomen (in ethanol), S. Korea, Gyeonggi-do, Pocheon-si, Yeongjung-myeon, Yeongpyeong-ri, MPRC, N38.03644°, E127.23226°, altitude 150 m, July 3, 2017, T.A. Klein, H.-C. Kim, NJ trap, (NIBR); one male (in ethanol), S. Korea, Gangwon-do, Chuncheon, Dongsan-myeon, KNU Experimental Forest, N37.77909°, E127.81580°, altitude 225 m, October 9, 2018, S. Podenas, at light (NIBR); one specimen with broken abdomen (in ethanol), S. Korea, Gyeonggi-do, Pocheon-si, Yeongjung-myeon, Yeongpyeong-ri, MPRC, N38.03644°, E127.23226°, altitude 150 m, May 21, 2019, T.A. Klein, H.-C. Kim, NJ trap (NIBR); one female (in ethanol), S. Korea, Gyeonggi-do, Pocheon-si, Yeongjung-myeon, Yeongpyeong-ri, MPRC, N38.03644°, E127.23226°, altitude 150 m, June 10, 2019, T.A. Klein, H.-C. Kim, NJ trap (NIBR); one female (in ethanol), S. Korea, Gyeonggi-do, Pocheon-si, Yeongjung-myeon, Yeongpyeong-ri, MPRC, N38.03644°, E127.23226°, altitude 150 m, June 18, 2019, T.A. Klein, H.-C. Kim, NJ trap (NIBR); two males (in ethanol), S. Korea, Gyeonggi-do, Pocheon-si, Yeongjung-myeon, Yeongpyeong-ri, MPRC, N38.03644°, E127.23226°, altitude 150 m, June 24, 2019, T.A. Klein, H.-C. Kim, NJ trap (NIBR).

73. *Eloeophila subdilata* (Alexander, 1972) (Fig. 79, Pl. 12B)

Limnophila (*Eloeophila*) *subdilata* Alexander, 1972: 8–9;

Eloeophila subdilata Oosterbroek, 2023.

DESCRIPTION. General. Body coloration grayish brown. Male body length 5.6–6.5 mm, female 7.0–7.5 mm, wing length of male 6.6–8.2 mm, female 8.5 mm. **Head.** Dark grayish brown.



Male antenna 1.1–1.5 mm long, nearly reaching base of wing if bent backwards. Scape and pedicel yellowish brown, basal half of flagellum brownish yellow, distal half brown. Flagellomeres oval, three basal segments dilated ventrally, apical segment large, slightly longer than preceding segment. Longest verticils up to 1.5 times as long as respective flagellomeres. Rostrum and palpus dark brown. **Thorax.** Prescutum and presutural scutum yellowish-brownish gray with distinct pattern of dark brown spots and stripes, medial stripes broken into separate spots, longer anteriorly, shorter posteriorly, stripes separated by broken medial line, wide and distinct at frontal margin of sclerite, broken into separate indistinct dots posteriorly, lateral stripe complete, starting behind pseudosutural fovea and reaching suture. Interspace with row of four or five dots. Lateral margin of sclerite darkened. Pseudosutural fovea with distinct narrow dark brown margin and paler central part. Scutal lobe concolorous with presutural scutum, marked with two small dark brown spots, one at fronto-lateral angle making extension of lateral prescutal stripe, other at the middle of lateral margin, area between lobes paler, marked with small dark brown spot posteriorly. Scutellum darker brown, sparsely

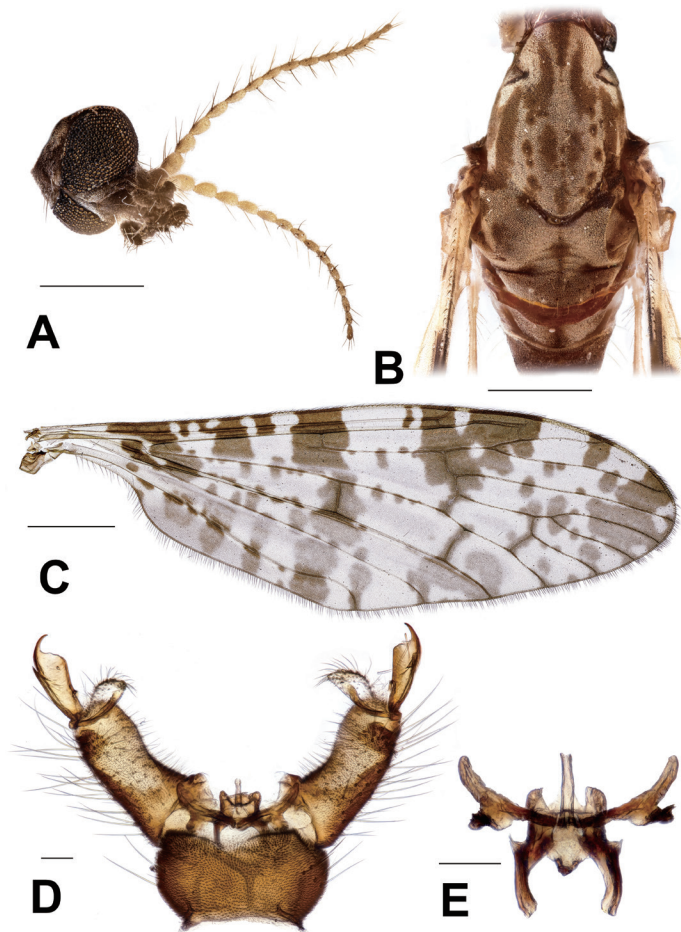


Fig. 79. *Eloeophila subdilata* (Alexander, 1972), male. **A.** Head, ventro-lateral view; **B.** Thorax, dorsal view; **C.** Wing; **D.** Genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A, B = 0.5 mm; C = 1.0 mm; D, E = 0.1 mm.

covered with yellowish pruinosity. Mediotergite light brownish gray with dark brown medial line. Pleuron pale grayish brown with irregular darker brown areas. Wing grayish, subhyaline, yellowish at base, patterned with seven dark brown spots along frontal margin. Stigma not darker than surrounding spot. Grayish areas surround cord, distal margin of discal cell, cross-veins and branching points of veins, small dots sparsely distributed along veins, diffuse grayish spots concentrated in posterior cells. Veins pale, dark brown in darkened areas. Venation typical for the genus: radial sector angulate and short-spurred at base, *m-cu* at about one third of discal cell's length. Discal cell longer than in most *Eloeophila* species. Cell *m*₁ very long compared to its stem, it is even 6.5 times as long as its stem. Anal vein distinctly arched at distal part. It reaches wing margin distinctly beyond level of supernumerary cross-vein in cell *bm*, base of radial sector before the level of supernumerary cross-vein. Distal wing cells without macrotrichiae. Male wing widened at posterior margin, widest at tip of anal vein. Stem of halter pale yellow with slightly infuscate base, knob dark brown to black with pale base. Male halter 0.9–1.1 mm long. Coxa dark brown, dusted with gray, trochanter yellowish brown with narrowly blackish ventral margin. Femur pale yellow with distinct wide dark brown subapical ring and pale brown apex. Rings subequal on all femora. Tibia yellow with narrowly dark brown apex, basal tarsomere brownish yellow with indistinctly darkened tip, remaining tarsomeres brown to dark brown. Claw black. Male femur I: 4.5–5.4 mm long, II: 5.4 mm, III: 6.1 mm, tibia I: 4.9–5.6 mm, II: 5.3 mm, III: 6.2 mm, tarsus I: 4.1–4.6 mm, II: 3.4 mm, III: 3.9 mm. **Abdomen.** Tergites grayish brown, second to seventh sternites with pale yellow basal part, widely dark brown along posterior and lateral margins, basal sternite entirely dark brown. Pregenital segment dark brown. Male genitalia brown. Posterior margin of epandrium widely concave at middle, covered with dense short blackish setae, postero-lateral angle slightly extended caudally. Gonocoxite elongate, 2.2 times as long as widest part at base, slightly arched, round-apexed. Outer gonostylus elongate, wider distally, with large apical spine, outer margin with low crest extending into strong subapical spine, inner margin smooth, subapical angle low, widely rounded. Inner gonostylus fleshy and setose, widest at about two-thirds, narrower at tip, pale, with darkened inner margin. Paramere with long slightly arched setoseless mesal lobe, lateral lobe short, black, with strongly widened basal part. Aedeagus straight, reaching to about posterior margin of paramere. Lateral projection of lower shelf extended into wide lobule, mesal projection short, extends along aedeagus. Lateral margin of lower shelf nearly straight. Lateral apodeme elongate, slightly arched, blackened at base. Sperm pump (vesica) subglobular. Apodeme of vesica small, triangle-shaped.

ELEVATION. From about 1400 m to nearly 2800 m.

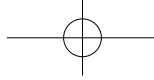
FLIGHT PERIOD. From early May through to beginning of July.

HABITAT. Unknown.

GENERAL DISTRIBUTION. India (Uttarakhand), Pakistan.

EXAMINED MATERIAL. Holotype, male (head, fore and hind legs and abdomen slide-mounted), India, Uttar Pradesh, Kumaon, Pauri Garhwal, Hanuman Chatti, altitude 2743 m (9000 ft), June 17, 1958, F. Schmid (USNM); allotype, female (antenna, wing and legs slide-mounted), topotypic; paratype, male (wing, legs and abdomen slide-mounted), India, Kumaon, Khumyara, Pauri Garhwal, altitude 1311–1524 m (4300–5000 ft), May 4, 1958, F. Schmid (USNM); paratype, male (antenna, wing, legs and abdomen slide-mounted), India, Kumaon, Tarsali, Pauri Garhwal, altitude 1829–2134 m (6000–7000 ft), May 6, 1958, F. Schmid (USNM); paratype, male (antenna, wing, legs and abdomen slide-mounted), India, Kumaon, Gawana, Teri Garhwal, altitude 1829





m (6000 ft), May 23, 1958, F. Schmid (USNM); paratypes, two males (wing and genitalia slide-mounted), India, Kumaon, Binaik Chatti, Pauri Garhwal, altitude 2134–2286 m (7000–7500 ft), June 16, 1958, F. Schmid (USNM); one male (pinned), India, Kashmir, Gulmarg, July 3, 1931, Fletcher (BMNH, Brit. Mus. 1932-13.); two males (pinned, genitalia in microvial with glycerol on same pin), Pakistan, Kaghan, NW7P, altitude 2038 m (6688 ft), June 27, 1953, Schmid (USNM); one male (pinned), India, Pauri Garhwal, Ugsara, altitude 1372 m (4500 ft), May 29, 1958, F. Schmid (USNM).

74. *Eloeophila submarmorata* (Verrall, 1887) – Small Mottled Linkwing (Fig. 80, Pl. 12C)

Ephelia submarmorata Verrall, 1887: 264; Pierre, 1924b: 118; Pont, 1995: 24;

Ephelia marmorata var. *submarmorata* Nielsen, 1925: 69–70; Lackschewitz, 1940: 73–74;

?*Ephelia marmorata* Bangerter, 1928: 158–159;

Limnophila (Elaeophila) submarmorata Edwards, 1938: 81–82; Coe, 1950: 42; Brindle, Bryce, 1960: 215; Brindle, 1967: 201;

Limnophila (Elaeophila) submarmorata var. *bistriata*, *eatonii*, *oligosticta*, *pentasticta*, *suffumata* Edwards, 1938: 83–84; Coe, 1950: 42;

Elaeophila submarmorata Crisp, Lloyd, 1954: 288;

Limnophila (Eloeophila) submarmorata Pokorný, 1978: 135, 139–141;

Eloeophila submarmorata var. *bistriata*, *eatonii*, *oligosticta*, *pentasticta*, *suffumata* Savchenko, 1986: 313–314;

Limnophila submarmorata Pont, 1995: 24, 194;

Eloeophila (Eloeophila) submarmorata Ujvarosi, 2007: 230;

Eloeophila submarmorata Savchenko, 1986: 313–314; 1989: 85; Podenas, 1995: 39; Starý, Oosterbroek, 1996: 55; Starý, Geiger, 1998: 74; Schacht, 1999: 134; 2005: 5; Godfrey, 2000: 22; 2001: 21, 23; Pakalniskis et al., 2000: 6; 2006: 19; Reusch, Oosterbroek, 2000: 155; Petersen, Jong, 2001: 149; Reusch, Bellstedt, 2001b: 268; Boyce, 2002: 17; Jong, Oosterbroek, 2002; Podeniene, 2003a: 124, 175, 176, 267; Oosterbroek, Simova-Tosic, 2004: 445; Starý, 2004; 2009a: 427; 2009b: 24; Ashe et al., 2005: 317, 323; 2008: 13; Ruckert, 2005: Attachement; Starý et al., 2005: 24; Ujvarosi, 2005: 245; Chaniecka, Wiedenska, 2006: 147; Podenas et al., 2006: plate 48; Reusch, 2006: 134; Boardman, 2007: 62; 2016: 130; Salmela et al., 2007: 37, 39, 45; Wiedenska, 2007: 75; 2010: 132; 2014: 12; 2015: 52; 2017: 13; Chandler et al., 2008: 11; Leskova, 2009: 116; Skidmore, 2009: 128; Cranston, Drake, 2010: 175; Penttinen et al., 2010: 485; Podeniene, Gelhaus, 2010: 188; Drake, 2011: 24; Kramer, 2011: 18; 2013: 8; Dufour, Merz, 2012: 354; Reusch, Heiss, 2012: 316; Salmela, 2012a: 237; 2012b: 11; Dunk, Kraus, 2014: 169; Hewitt, 2014: 13; Salmela, Petrasius, 2014: 27; Carles-Tolra, 2015: 119; Lindstrom, Fritz, 2015: 14, 26, 39, 41, 44, 47; Boardman, 2016: 130; Koç et al., 2016: 196; Brighton, 2017: 27; Hubenov, 2018: 15; 2021: 30; Olsen et al., 2018: 143, 158, 159; Starý, Vonicka, 2018: 49; Stuke, 2019: 142; Kolcsar et al., 2021: 95–96; Quindroit, Lemoine, 2021: 6; Stubbs, 2021: 329; Kramer, Morris, 2022: 6; Quindroit, 2022: 19; Oosterbroek, 2023.



DESCRIPTION. General. Body coloration grayish brown. Male body length 4.5–5.7 mm, that of female 4.8–6.6 mm, male wing length 6.6–10.0 mm, female 6.2–7.0 mm. **Head.** Brown, light brownish gray along eye margin and on anterior vertex, covered with sparse light brown setae. Male antenna 1.0–1.5 mm long, nearly reaching base of wing if bent backwards. Female antenna 0.9–1.3 mm long. Scape elongate, slightly wider distally, dark brown, 2.5 times as long as second antennomere, covered with few erect grayish setae dorsally. Pedicel brown, cup-shaped. Flagellum pale yellow to brownish yellow, four basal flagellomeres oval, distinctly dilated on ventral side, remaining flagellomeres elongate. Apical segment elongate, as long as preceding segment. Longest verticils 1.4 times as long as respective segments. Rostrum grayish brown. Palpus dark brown. **Thorax.** Pronotum brownish gray with indistinct darker brown medial stripe. Prescutum and presutural scutum yellowish-brownish gray, distinctly patterned with dark brown stripes. Medial stripes separated by light area subequal to the width of stripe and indistinct medial line. Stripe far not reaching suture. Lateral stripe reduced posteriorly, interspace with elongate spot extending onto scutal lobe. Lateral margin of sclerite darkened. Scutal lobe concolorous with the presutural scutum, darker where pruinosity denuded, with two dark brown spots, small anteriorly and larger closer to the medial margin. Area between lobes light brownish gray with dark brown caudal spot that extends towards caudal margin of scutellum. Mediotergite light gray. Pseudosutural fovea distinct, black, semi-polished, surrounded by yellowish gray area. Pleuron brown, gray pruinose, with small indistinct darker brown spots. Dorsopleural membrane pale brownish. Wing whitish with diffuse grayish areas confined to posterior cells, yellowish at base, pattern consists of seven larger dark brown spots along frontal margin, narrow darker areas surround cross-veins and vein tips along wing margin. Spots narrower than interspaces. Stigma dark brown. Wing pattern variable, and Edwards (1938) suggested to separate different forms, but some specimens can not be ascribed to one or the other form without hesitation. Veins pale, dark brown in darkened areas. Venation typical for the genus, radial sector arcuate at base, *m-cu* at about middle of discal cell. Cell m_1 long, nearly twice as long as its stem. Anal vein arched before wing margin and short-spurred at the base of arch. It reaches wing margin distinctly beyond level of supernumerary cross-vein in cell *bm*, base of radial sector before supernumerary cross-vein. Distal wing cells without macrotrichiae. Male wing extended posteriorly, widest at tip of anal vein. Male halter 1.0–1.2 mm long, that of female 1.0–1.1 mm, with pale stem and dark brown knob. Coxa grayish brown, trochanter obscure yellow with narrowly black distal margin. Femur pale-grayish yellow with dark grayish brown apical ring. Tibia pale yellow with narrowly dark brown apex. Two basal tarsomeres pale yellow with narrow and indistinct darkening at tip. Remaining tarsomeres grayish brown to dark brown. Claw dark brown. Male femur I: 4.3–4.4 mm long, II: 4.4–6.9 mm, III: 4.7–6.5 mm, tibia I: 4.4–4.6 mm, II: 4.0–6.3 mm, III: 4.7–7.0 mm, tarsus I: 4.0 mm, II: 5.7 mm. Female femur I: 4.9 mm long, II: 5.3–5.5 mm, III: 5.7 mm, tibia I: 4.7 mm, II: 4.7 mm, III: 5.5 mm, tarsus I: 4.8 mm, II: 4.4 mm, III: 3.9 mm. **Abdomen.** Basal segment grayish dark brown. Tergites and sternites of second to sixth segments light brown with wide dark brown posterior and lateral margins. Pregenital segment entirely dark. Ninth segment of male genitalia dark brown with yellowish brown gonocoxite. Epandrium extended caudally, posterior margin nearly straight, postero-lateral angle rounded. Hypandrium with small medial lobule (well visible in lateral view). Gonocoxite elongate, 2.2–2.4 times as long as widest part at base, moderately arched, basal part slightly enlarged, apex rounded. Outer gonostylus wide, terminating in a small, curved spine, outer margin serrate at distal half, inner margin with subapical



angle pronounced. Crest on outer margin wide, raised upwards, evenly rounded, without terminal spine. Inner gonostylus pale with basal half of inner margin dark brown, setose, narrower towards apex. Paramere with elongate, wide mesal lobe that narrows apically, covered with fine setulae caudally, lateral lobe short, black, with rounded apex. Aedeagus straight and short in dorsal view, far not reaching apex of mesal process of paramere. Lateral projection of lower shelf slightly extended posteriorly, rounded, mesal projection extended along aedeagus. Lateral apodeme elongate and curved. Sperm pump (vesica) ovoid. Apodeme of vesica directed anteriorly, short, peg-shaped and blackened.

ELEVATION. From sea level to 1500 m.

FLIGHT PERIOD. From middle of June through to beginning of August.

HABITAT. Most associated with woodland seepages, especially those that are calcareous. It

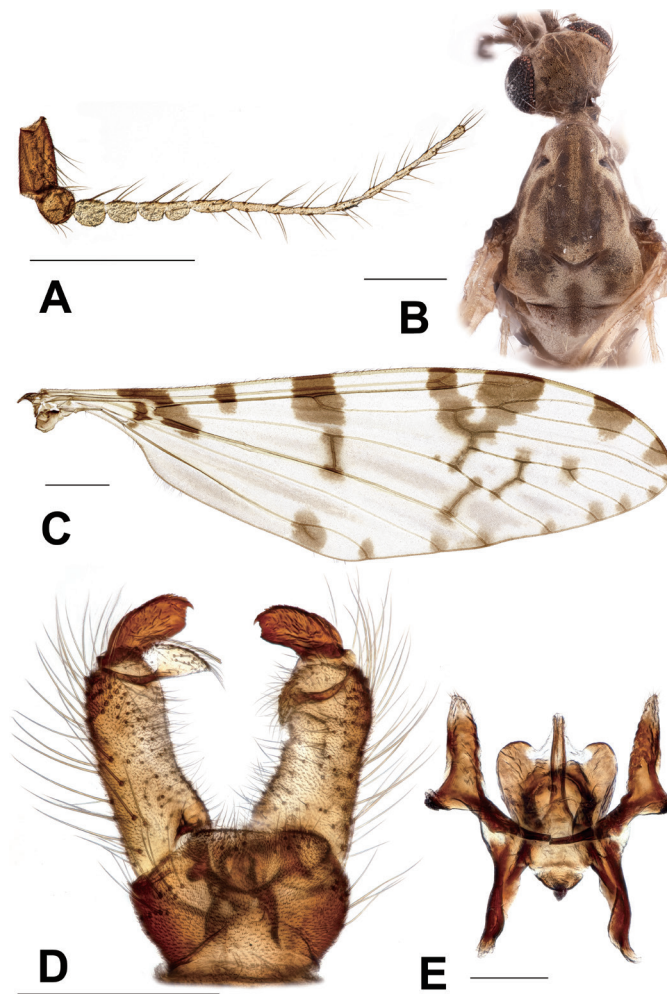
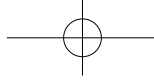


Fig. 80. *Eloeophila submarmorata* (Verrall, 1887), male. **A.** Antenna; **B.** Thorax, dorsal view; **C.** Wing; **D.** Genitalia, dorsal view; **E.** Aedeagal complex, dorsal view. Scale bars: A, B = 0.5 mm; C = 1.0 mm; D, E = 0.1 mm.





can also feature in fen carr and various other types of wet woodland and is sometimes found along small woodland streams. There would appear to be a strong association with peat and other highly organic substrates (Stubbs, 2021); brooks, small rivers, swamps, moist soil (Ujvarosi, 2005); shaded woodland and dingle woodlands (Boardman, 2007).

GENERAL DISTRIBUTION. Widely spread through Europe (Austria, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy (including Sicily), Lithuania, Netherlands, Norway, Poland, Romania, Serbia, Slovakia, Slovenia, Sweden, Switzerland, European part of Turkey, Ukraine, European part of Russia, and Western East Palearctic (Georgia, Asiatic part of Turkey, Iran).

EXAMINED MATERIAL. One male (pinned), France, (Hte-Gar.), Hospice de France, June 25, 1950, F. Schmid (MCSN-VD); one male (pinned), Switzerland, Lugano, Hasle, Balmoos, 970 m, June 14, 1976, LF, L. Rezbanyai (MHNN); one male (pinned), Switzerland, Luzern, Hasle, Balmoos, 970 m, June 27, 1977, LF, L. Rezbanyai (MHNN); one male (pinned), Switzerland, Luzern, Hasle, Balmoos, 970 m, August 3, 1977, L. Rezbanyai (MHNN); one male (pinned), Switzerland, Valais, Giettes, June 16, 1979, C. Dufour (MHNN); one male (in ethanol), Switzerland, Vaud, Cuarnens, July 22, 1979 (MHNN); one male (in ethanol, wing and genitalia slide-mounted), Switzerland, SH, Schaffhausen, altitude 540 m, July 21–27, 1980, C. Dufour, W. Geiger, T. Malaise lumineuse (MHNN); one male (pinned), Lithuania, Varena district, Puvociai, June 23, 1990, S. Podenas (VU); one male (pinned), France-Pyr. orientales, Pyrénées, 1.5 km E Mont-Louis, Sauto (Mas de Cassagne), 1450 m, June 20–23, 1991, C. Dufour, W. Geiger, J.P. Haenni (MHNN); one male (in ethanol), Lithuania, Varena district, river Skroblus, July 8, 1994, S. Podenas (VU).

75. *Eloeophila suenisoni* (Alexander, 1926) (Fig. 81)

Limnophila (*Ephelia*) *suenisoni* Alexander, 1926b: 373;

Eloeophila suenisoni Oosterbroek, 2023.

DESCRIPTION. General. Body coloration dark brown, dusted with gray. Male body length 6.0 mm, female 6.1 mm, male wing length 6.7–7.0 mm, that of female 6.6 mm. **Head.** Brownish gray, darker posteriorly, vertex with dark brown medial line. Male antenna nearly reaching base of wing if bent backwards, female antenna 0.8 mm long. Scapal segment brownish black. Pedicel brown, subglobular. Flagellar segments elongate. Basal flagellomeres light yellow, middle flagellomeres yellow with darkened bases. Apical segment elongate. Rostrum brown. Palpus dark brown. **Thorax.** Pronotum light gray with distinct dark brown medial line. Prescutum and presutural scutum yellowish-grayish brown, patterned with dark brown spots and dots, but usual longitudinal stripes missing. Scutal lobe concolorous with presutural scutum and with large dark brown spot reaching posterior margin. Area between lobes paler with dark brown spot postero-medially. Pseudosutural fovea distinct, dark brown, surrounded by light gray area. Scutellum brown with dark brown spot fronto-medially. It makes short stripe together with postero-medial spot between scutal lobes. Mediotergite gray, distinctly darkened along posterior margin. Pleuron gray, spotted with dark brown. Wing whitish, yellowish at base and along costal area, patterned with abundant dark brown spots: transverse suture at the level of base of radial sector and supernumerary cross-



vein in cell *bm* broken into separate spots, spot at tip of *Sc* separate from suture starting at *R*₁ and extending through cord, small spots at tips of *R*₃ and *R*₄. Dark spots at frontal wing margin distinctly narrower than interspaces. Numerous small dots evenly distributed along veins and in all cells. Stigma dark brown. Veins brownish yellow, dark brown in darkened areas. Venation typical for the genus, radial sector arcuate at base, *m-cu* approximately at middle of discal cell, cell *m*₁ slightly exceeds its stem in length. Anal vein slightly sinuous. It reaches wing margin slightly beyond the level of supernumerary cross-vein in cell *bm*. Base of *Rs* slightly before the level of supernumerary cross-vein in cell *bm*. No macrotrichiae present in distal wing cells. Male wing narrow, just slightly widened along posterior margin, widest beyond tip of anal vein. Stem of halter brownish yellow, knob dark brown. Coxae brown, fore pair with yellowish markings frontally and laterally. Fore and middle trochanters brown with yellowish markings, posterior darker brown. Femur yellow, narrowly pale at base, with dark brown subapical ring and paler brown tip. Tibia yellow with narrowly darkened tip. Two basal tarsomeres yellow with narrowly darkened tips, remainder of tarsus brown. Female halter 0.9 mm long. Female femur II: 4.3 mm long, III: 4.8 mm, tibia II: 4.5 mm, III: 4.9 mm, tarsus II: 3.6 mm, III: 3.5 mm. **Abdomen.** Dark brown, tergites and sternites at middle of abdomen paler at base, thus posterior and lateral margins widely darker brown. Male terminalia lighter brown. Posterior margin of epandrium darkened with wide but shallow emargination at middle, both sides of it slightly extended posteriorly. Gonocoxite elongate, nearly twice as long as width at base, slightly dilated at base of ventro-mesal surface. Outer gonostylus elongate, finely setose at distal part, armed with strong curved spine at tip, crest on outer margin with strong blunt outgrowth rather than spine starting at about middle of gonostylus. Inner margin slightly dilated at distal end with rounded subapical angle. Inner gonostylus wide, elongate, fleshy and setose, strongly narrowing towards apex, pale with basal half of inner margin darkened. Mesal branch of paramere

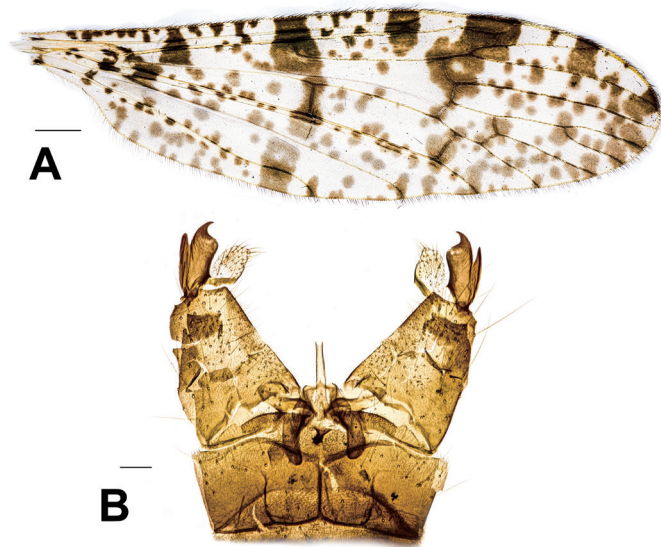
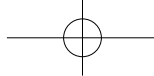


Fig. 81. *Eloeophila suensoni* (Alexander, 1926), male, holotype. **A.** Wing; **B.** Genitalia, dorsal view. Scale bars: A = 0.5 mm; B = 0.1 mm.





slightly arched, widened at distal part, lateral branch curved and narrow with spine-shaped apical part. Lateral process of lower shelf slightly raised, mesal part not produced. Aedeagus straight and long, shallowly bifid at tip, reaching far beyond tip of paramere. Lateral apodeme elongate, slightly arched, darkened, plate-shaped. Sperm pump (vesica) oval. Apodeme of vesica elongate with small lateral bump.

ELEVATION. Unknown.

FLIGHT PERIOD. Beginning of May.

HABITAT. Unknown.

GENERAL DISTRIBUTION. China (Zhejiang Province).

EXAMINED MATERIAL. Holotype, male (wing and genitalia slide-mounted), China, Che-Kiang [Zhejiang], Hills south of Ning-po, May 1, 1925, E. Suenson (USNM).

76. *Eloeophila superlineata* (Doane, 1900) (Fig. 82, Pl. 12D)

Limnophila superlineata Doane, 1900: 190–191;

Limnophila (Eloeophila) superlineata Alexander, 1967: 107, 248–249;

Eloeophila superlineata Oosterbroek, 2023.

DESCRIPTION. General. Body coloration brown, gray pruinose. Male body length 5.4–7.6 mm, female 6.0–9.8 mm, male wing length 7.0–7.7 mm, female 7.6–9.1 mm. **Head.** Brown, dusted with gray, darker posteriorly, narrowly light gray along eye margin. Male antenna 1.1–2.4 mm long, reaching base of wing if bent backwards. Female antenna 1.2–1.5 mm long. Scape elongate, dark brown, sparsely covered with gray pruinosity. Pedicel brown, subglobular, bearing few strong setae. Basal half of flagellum brown, outer segments infusate. Four basal flagellomeres slightly dilated ventrally, short oval. Remaining flagellomeres elongate. Apical segment oval, approximately as long as penultimate. Longest verticils 1.8 times as long as respective flagellomeres. Six basal flagellar segments covered with dense short whitish erect pubescence on ventral side, pubescence on remaining flagellomeres less distinct. Rostrum brown. Palpus dark brown. **Thorax.** Pronotum yellowish-grayish brown with darker brown spot postero-medially. Prescutum and presutural scutum grayish yellow with four longitudinal stripes. Medial stripes darker in middle, faded frontally. Area separating medial stripes distinctly narrower than stripe itself. Lateral stripe short, reaching suture. Lateral margin of sclerite pale yellow. Scutal lobe darker brown at middle, paler along margins, dusted with yellowish. Area between lobes yellowish with indistinct darker brown medial line. Pseudosutural fovea distinct, dark brown, rounded, surrounded by yellowish area. Scutellum brown with whitish yellow lateral and posterior margins. Mediotergite uniformly pale. Pleuron brown, densely dusted with gray. Wing grayish, subhyaline, yellowish at base and in costal area, patterned with seven grayish brown spots along frontal margin and sparse dots in all cells except costal area. Spots distinctly narrower than interspaces. Stigma grayish brown. Grayish brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins. Small dots surround vein tips at posterior wing margin. Veins grayish brown, yellowish at wing base and costal area. Venation typical for the genus, radial sector angulate and short-spurred at base, *m-cu* at middle of discal cell, cell m_1 long, 1.7 times as long as its stem. Anal vein slightly arched before wing margin with short



subapical spur. It reaches wing margin slightly beyond level of supernumerary cross-vein in cell *bm*. Distal wing cells without macrotrichiae. Male wing narrow, not widened at posterior margin, widest at tip of vein *CuP*. Halter 0.9–1.1 mm long in male, 1.0–1.4 mm in female, brownish yellow with slightly darker base and knob. Fore and middle coxae brown, yellowish ventrally. Posterior coxa tawny, darker dorsally. Trochanters buffy. Femur yellow, pale at base, brown at apex. Tibia and basal tarsomere buffy. Base of femur wider, apex narrowly brown. Apices of first and second tarsomeres narrowly dark brown. Distal tarsomeres brown to dark brown. Claw blackish. Male femur I: 4.0–4.7 mm long, III: 5.3–5.6 mm, tibia I: 5.0–5.5 mm, III: 4.9–5.1 mm, tarsus I: 4.1–5.3 mm, III: 3.7–3.9 mm. Female femur I: 4.6–5.9 mm long, II: 6.2–7.7 mm, III: 4.6–5.3 mm, tibia I: 4.2–6.4 mm, II: 6.0 mm, III: 4.5–6.0 mm, tarsus I: 4.2–6.1 mm, II: 5.1–5.5 mm, III: 3.2–4.3 mm. **Abdomen.** Tergites brown, marked with yellowish at base, sternites brownish yellow with widely brown posterior margins. Brown area gets narrower towards distal end of abdomen, pregenital segment brown. Tergites and sternites covered with sparse yellowish setae. Male terminalia rusty

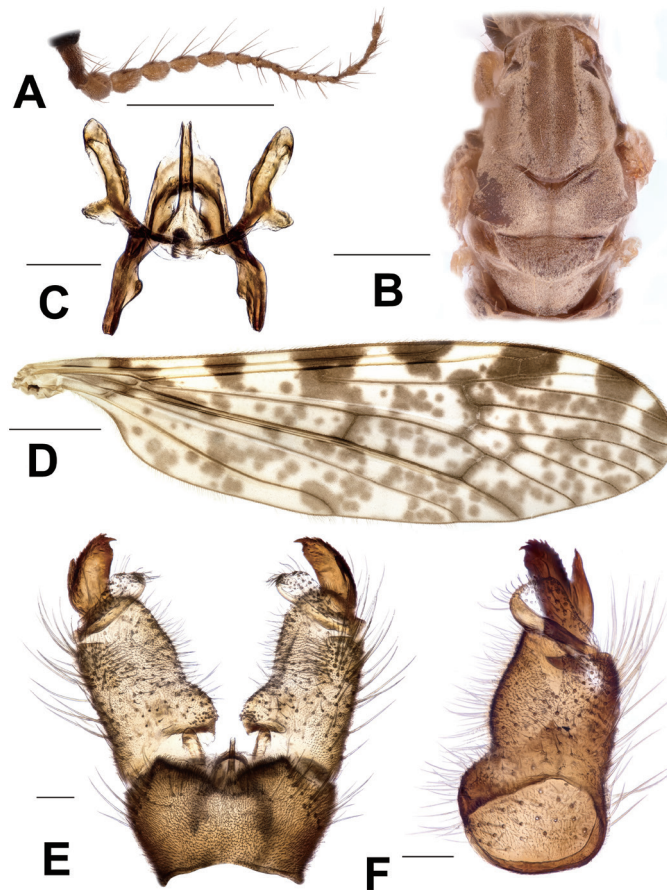


Fig. 82. *Eloeophila superlineata* (Doane, 1900). **A.** Male antenna; **B.** Female thorax, dorsal view; **C.** Aedeagal complex, dorsal view; **D.** Wing (Doane slide No 127, most probably type); **E.** Genitalia, dorsal view; **F.** Gonocoxite with gonostylus, fronto-dorsal view. Scale bars: A, B, D = 0.5 mm; C, E, F = 0.1 mm (D photographed by Joel D. Gardner).



brown. Posterior margin of epandrium with wide and shallow “V”-shaped emargination and covered with dense short blackish setae. Both sides of emargination extended into low wide triangle-shaped lobes. Gonocoxite elongate, 1.8 times as long as widest part, narrows apically, with rounded ventromesal lobe. Outer gonostylus elongate, sclerotized, brown. Apex with large spine. Distal half of outer margin finely serrate with large crest extended into big spine staying at the right angle to the rest of gonostylus, thus hardly visible in exactly dorsal view. Inner gonostylus pale, blunt, fleshy and setose. Paramere with long mesal blade-shaped lobe lacking any setae, lateral lobe short and blunt. Aedeagus almost straight, extending to about apex of mesal process of paramere. Lateral margin of lower shelf smooth, not extended, mesal part membranous, extending along aedeagus. Lateral apodeme wide, slightly arched, swollen at middle. Apodeme of vesica directed ventrally and visible only as darkened area in dorsal view. Sperm pump (vesica) oval.

ELEVATION. Close to 1100 m.

PERIOD OF ACTIVITY. Adults are flying from early April through to late August.

HABITAT. Small sandy rapid creeks and rocky streams in deep canyons covered with mixed trees (large pines, cedars, oaks) and shrubs (rose, blackberry), dense grassy vegetation. This species was found resting on dark side of boulder with wings closed and abdomen at angle to rock, light catching wing pattern.

GENERAL DISTRIBUTION. USA (Oregon and Washington).

EXAMINED MATERIAL. Wing (slide-mounted) (as *Limnophila* C), No 127, Doane slide box (most probably belongs to type series) (WSU); one male (wing and genitalia slide-mounted), USA, Washington, Olympia, May 9, 1894, R.W. Doane (compared with type by C.P. Alexander) (USNM); one female (pinned), USA, Washington, Ilwaco, May 5, 1918, A.L. Melander (USNM); one female (pinned), USA, Colorado, Dolores, August 27, 1918 (ANSP); one female (pinned), USA, Colorado, La Veta, August 10, 1920 (ANSP); three males, one specimen with unclear sex (pinned, genitalia of one male in microvial with glycerol on same pin, antenna, leg and abdomen of one male slide-mounted), USA, Oregon, Peavine Sts. 1 and 9, April 22, 1947, K.M. Fender (USNM); one female (pinned), USA, Oregon, Peavine Ridge, May 1, 1947, K.M. Fender (USNM); two females (pinned), USA, Oregon, Blue Mountains, Dixie Pass, Lunch Creek, June 14–15, 1951, B. Malkin (USNM); one male (whole specimen slide-mounted), one female (wing slide-mounted), USA, California, Riverside Co., Santa Rosa Mts., Horsethief Creek, altitude 1067 m (3500 ft), April 5, 1970, L. La Pre (USNM).

***Eloeophila tergilobellus* Kato, 2021 (Fig. 83, Pl. 12E)**

Eloeophila tergilobellus Kato, 2021: 444–445; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration dark brown, sparsely gray pruinose. Male body length 4.8–5.5 mm, female 5.6–6.2 mm, male wing length 4.7–6.5 mm, female 5.8–6.7 mm. **Head.** Dark brown, dusted with yellowish gray, darker posteriorly, narrowly light gray along eye margin. Male antenna 2.1–2.2 mm long, reaching posterior margin of third abdominal segment if bent backwards. Scape elongate, dark reddish brown, sparsely covered with gray pruinosity. Pedicel brown, oval, bearing few strong setae. Flagellum brown, bases of few basal segments narrowly



pale, flagellomeres elongate, subcylindrical, covered with short dense erect grayish pubescence. Apical flagellomere small, penultimate approximately twice as long as apical segment. Longest verticils as long as respective flagellomeres. Rostrum brown, palpus dark brown. **Thorax.** Pronotum grayish brown with darker brown dorsal stripe. Postpronotum pale brown. Prescutum and presutural scutum uniformly grayish brown without darker spots or stripes. Scutal lobe darker brown, dusted with yellowish gray. Area between lobes yellowish. Pseudosutural fovea dark brown. Scutellum dark brown, yellowish fronto-medially. Mediotergite uniformly dark brown, sparsely covered with yellowish gray pruinosity. Pleuron dark brown, sparsely dusted with gray. Wing grayish, subhyaline, yellowish at base, not patterned except oval brownish stigma. Veins pale brown, yellowish in prearcular area. Venation typical for the genus, radial sector arcuate at base, *m-cu* slightly before middle of discal cell, cell m_1 long, 1.2 times as long as its stem. Anal vein slightly arched before

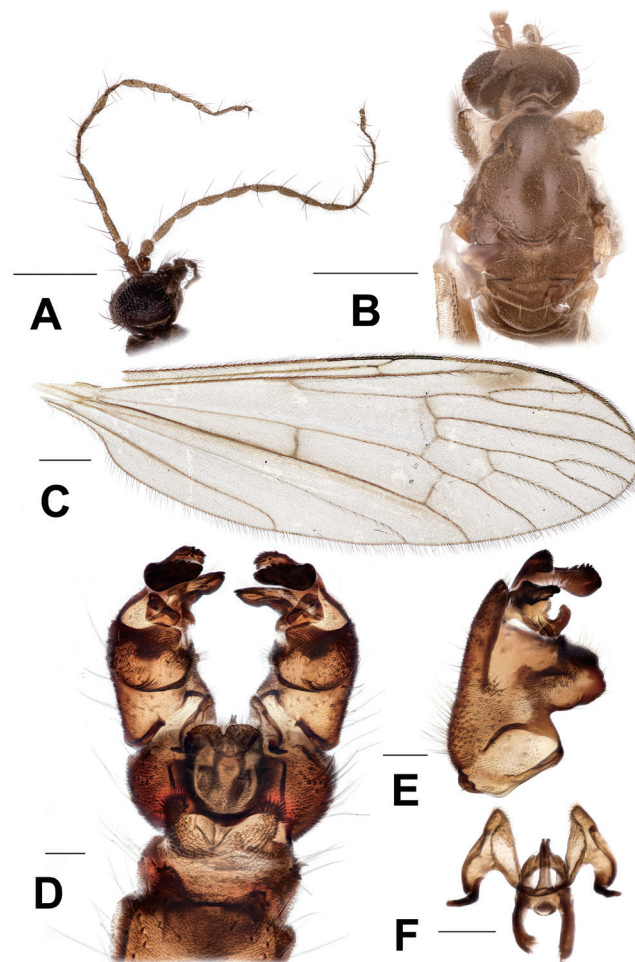


Fig. 83. *Eloeophila tergilobellus* Kato, 2021, male, paratype. **A.** Head, lateral view; **B.** Thorax, dorsal view; **C.** Wing; **D.** Genitalia, dorsal view; **E.** Gonocoxite with gonostyles, fronto-lateral view; **F.** Aedeagal complex, dorsal view. Scale bars: A–C = 0.5 mm; D–F = 0.1 mm.



wing margin. Supernumerary cross-vein in cell *bm* slightly beyond level of *Rs* base and tip of anal vein. Distal wing cells without macrotrichiae. Male wing narrow, not widened at posterior margin, widest at tip of vein *CuP*. Halter stem pale yellow with slightly infuscate base, knob brownish. Fore and middle coxae dark brown, yellowish ventrally. Posterior coxa obscure yellow, darker dorsally. Trochanters brownish yellow with narrow dark brown distal margin. Femur pale brown with light yellow base and darker brown apex. Tibia brownish yellow with narrowly darkened apex. Two basal tarsomeres brownish yellow, remaining segments brown to dark brown. Claw dark brown. Male femur III: 4.5 mm long, tibia III: 4.5 mm, tarsus III: 3.4 mm. **Abdomen.** Tergites and sternites dark brown, covered with sparse whitish setae, pregenital segment blackened. Sixth and seventh tergites with paired lobes on posterior margin, covered with short setae. Male terminalia dark brown with rusty brown gonocoxites. Epandrium modified, with wide membranous area in the middle and paired finely serrate and setose rounded lobes at middle of posterior margin. Gonocoxite short, bearing large subglobular setose lobe on dorsal side, ventral margin produced caudally. Outer gonostylus with two branches, ventral branch knob-shaped outer margin serrate and covered with small spines, dorsal branch blackened, narrower towards apex, curved and armed with fine spines. Inner gonostylus with two lobes, outer lobe extended and flattened, inner lobe strongly curved. Paramere wide, triangle-shaped, caudal part of mesal lobe finely setose, lateral lobe narrow, blackened and strongly curved. Aedeagus short and straight, bifid at apex, far not reaching caudal margin of paramere. Lateral margin of lower shelf low, not produced, mesal part membranous, extending along aedeagus. Lateral apodeme elongate, dark brown, slightly arched. Sperm pump (vesica) subglobular, apodeme of vesica directed ventrally, small, wider than longer in dorsal view.

ELEVATION. From about 700 m to more than 900 m.

PERIOD OF ACTIVITY. Adults are flying from early May through to beginning of July.

HABITAT. Unknown.

GENERAL DISTRIBUTION. Japan (Honshu Island).

EXAMINED MATERIAL. Paratype, one male (pinned), Japan, Aomori, Fukaura Town, Mountain Takanio, May 11, 2014, D. Kato (NRC).

78. *Eloeophila tigricosta* Starý, 2009a (Fig. 84, Pl. 12F)

Eloeophila tigricosta Starý, 2009a, Oosterbroek, 2023.

DESCRIPTION. General. Body coloration yellowish-brownish gray. Male wing length 8.2–9.0 mm. **Head.** Gray, vertex with small brownish medial spot. Male antenna 1.1 mm long. Antennal flagellum entirely brown. **Thorax.** Pronotum yellowish gray with dark brown dorso-medial stripe. Postpronotum light gray. Prescutum and presutural scutum light gray with four dark brown longitudinal stripes. Medial stripes distinct and complete, extending from anterior margin of sclerite and reaching suture, wide, confluent at the anterior end and separated by narrower light yellowish gray area caudally. Lateral stripe short, reduced to oblique oval spot. Lateral margin of sclerite darkened beyond pseudosutural fovea. Scutal lobe concolorous with presutural area, with small dark brown spot postero-medially. Area between lobes whitish gray with narrow darker brown medial line. Pseudosutural fovea distinct, dark brown or black, surrounded by whitish gray area. Scutellum



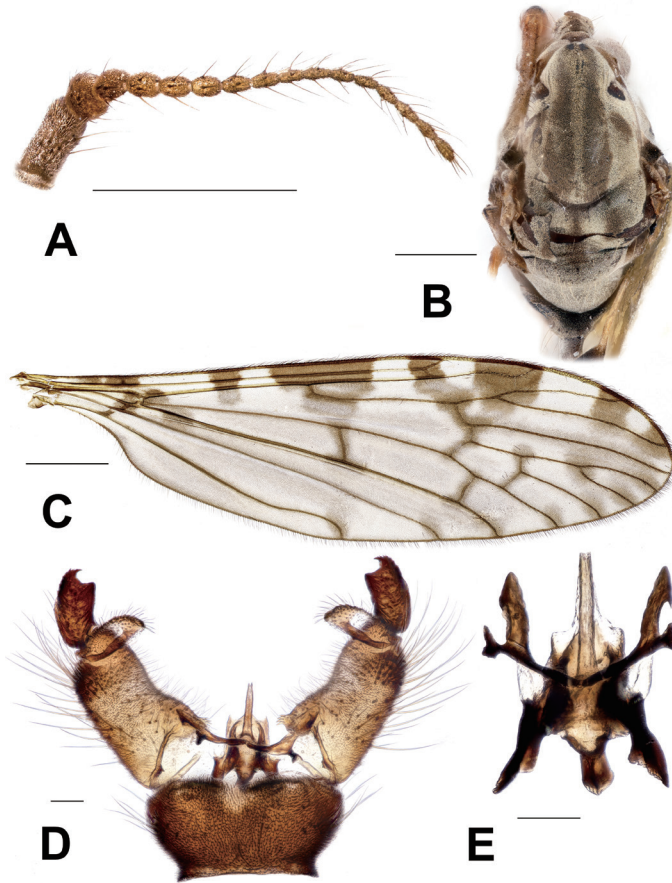


Fig. 84. *Eloeophila tigricosta* Starý, 2009a, male. **A.** Antenna; **B.** Thorax, dorsal view, paratype; **C.** Wing, paratype; **D.** Genitalia, dorsal view; **E.** Aedeagal complex, dorsal view, paratype. Scale bars: A, B = 0.5 mm; C = 1.0 mm; D, E = 0.1 mm.

dark gray with darker spot in the middle of anterior margin. Mediotergite uniformly light gray. Pleuron dark gray. Wing grayish, subhyaline, yellowish in prearcular area, patterned with seven dark grayish brown spots along frontal margin. Stigma dark, but not distinctly darker than surrounding spot. Grayish brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins. Small dots surround vein tips at posterior wing margin. Veins grayish brown, yellowish at wing base and costal area, dark brown in darkened areas. Venation typical for the genus, radial sector angulate and short-spurred at base, *m-cu* at middle of discal cell, cell *m*₁ long, 1.3 times as long as its stem. Anal vein slightly sinuous. It reaches wing margin at the level of supernumerary cross-vein in cell *bm*. Distal wing cells without macrotrichiae. Male wing narrow, not widened at posterior margin, widest between tips of vein *A*₁ and *CuP*. Stem of halter pale yellow with brownish base, knob darkened. Male halter 1.0–1.2 mm long. Male femur I: 5.4 mm long, II: 6.3 mm, III: 5.7 mm, tibia I: 6.5 mm, II: 6.7 mm, III: 5.2 mm, tarsus I: 5.9 mm, III: 4.1 mm. **Abdomen.** Tergites pale



yellow. Male terminalia dark brown with paler brown gonocoxites. Posterior margin of epandrium with wide and shallow emargination at middle and covered with dense short blackish setae, posterolateral angle slightly raised. Gonocoxite elongate, 1.6 times as long as widest part at base, narrows apically and slightly produced ventro-medially at base into small lobule, margin of which armed with 6 small spines. Outer gonostylus elongate, sclerotized, brown, apex with large spine, outer margin serrate distally and bearing large crest which is hardly visible in dorsal view, inner margin of gonostylus smooth, ending in a large sharp angulate lobe circumscribing large rounded subapical emargination. Inner gonostylus simple, widest at middle, blunt-apexed, pale, fleshy and setose with darkened inner margin. Mesal lobe of paramere blade-shaped, without setae, lateral lobe short and curved. Aedeagus straight, extending slightly beyond apex of mesal process of paramere. Lateral projection of lower shelf angulate, slightly less produced in one studied specimen than in holotype, mesal part membranous, extending along aedeagus. Lateral apodeme wide, slightly curved, blackened. Sperm pump (vesica) elongate, oval. Apodeme of vesica dark brown, slightly extended, broad, with rounded anterior margin.

ELEVATION. From slightly above 500 m to 800 m.

PERIOD OF ACTIVITY. From mid-May through to early July.

HABITAT. Unknown.

GENERAL DISTRIBUTION. Spain.

EXAMINED MATERIAL. Holotype, male (pinned), Spain, Castilla y Leon, Avila, Sierra de Gredos, Arenas de San Pedro, altitude 550 m, May 15 – June 4, 1976, P. Oosterbroek, E. Boersma (Naturalis); one male (pinned), Spain, San Rafael, May 20, 1947, F. Schmid (MCSN-VD); one male (pinned), Spain, Huesca, Jaca, altitude 800 m, June 27 – July 6, 1975, A.E. Stubbs, B.M. 1975–389 (BMNH).

NOTE. Some holotype characters were sent to me by Pasquale Ciliberti.

79. *Eloeophila trimaculata* (Zetterstedt, 1838) – Three-spotted Linkwing (Fig. 85, Pl. 13A)

Limnobia trimaculata Zetterstedt, 1838: 833;

Idioptera trimaculata Loew: 1871: 10; Edwards, 1921: 221; Meijere, 1921: 56–57; Pierre, 1924b: 116–117; Nielsen, 1925: 66–67;

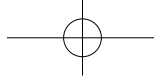
Ephelia trimaculata Sintenis, 1884: 11;

Limnophila (Elaeophila) trimaculata Edwards, 1938: 78; Coe, 1950: 41; Brindle, 1958: 61; 1967: 201; Brindle, Bryce, 1960: 215;

Eloeophila (Eloeophila) trimaculata Ujvarosi, 2007: 230;

Eloeophila trimaculata Savchenko, 1986: 306, 315–316; 1989: 85; Podenas, 1995: 39; Starý, Oosterbroek, 1996: 55; Starý, Geiger, 1998: 74; Schacht, 1999: 134; 2005: 5; Pakalniskis et al., 2000: 6; 2006: 19; Reusch, Oosterbroek, 2000: 155; Petersen, Jong, 2001: 149; Jong, Oosterbroek, 2002; Podeniene, 2003a: 124, 126, 175, 267; 2003b: 22; Starý, 2004; 2009a: 426–427; 2009b: 24; Podenas et al., 2006: plate 48; Ahonen, 2007: 8, 24; Salmela et al., 2007: 45; 2015: 101; Wiedenska, 2007: 75; 2010: 132; Ribeiro, 2008: 631, 635, 655, 671, 681, 682, 683, 684, 691; Salmela, 2008: 26; 2012a: 237; 2012b: 11; Reusch, Hohmann, 2009: 129; Skidmore,





2009: 128; Hewitt, 2014: 13; Salmela, Petrasius, 2014: 27; Lindstrom, Fritz, 2015: 44, 47; Boardman, 2016: 130; Hubenov, 2016: 47; 2017: 68; 2021: 30; Brighton, 2017: 27; Olsen et al., 2018: 158, 159; Starý, Vonicka, 2018: 49; Stuke, 2019: 142; Quindroit, 2020a: 30, 46; Kolcsar et al., 2021: 96; Stubbs, 2021: 329; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration grayish brown with yellow Abdomen. Male body length 6.0–7.8 mm, that of female 7.0–10.5 mm, male wing length 7.1–8.0 mm, female 8.8–9.1 mm. **Head.** Dark brown, densely covered with gray pruinosity, somewhat paler along eye margin, covered with sparse yellowish setae, vertex with darker narrow spot medially. Male antenna 1.7–2.8 mm long, nearly reaching caudal margin of second abdominal segment if bent backwards, female antenna distinctly shorter, 1.9 mm long, reaching base of wing if bent backwards. Scape comparatively short but wide, only 1.3 times as long as widest part, but nearly twice as long as second scapal segment. Pedicel subglobular. Both basal segments dark brown. Flagellum dark brown, just base of first flagellomere narrowly yellow. Flagellomeres elongate, apical segment small, preceding segment 1.6 times as long as apical. Longest verticils reaching only 0.7 length of respective flagellomeres. Rostrum and palpus dark brown. **Thorax.** Pronotum, prescutum and presutural scutum gray, densely covered with yellowish pruinosity. Presutural scutum with two indistinct darker medial stripes. Scutal lobe dark grayish brown with yellowish margins, area between lobes more densely covered with yellowish pruinosity. Scutellum yellowish brown with pale gray posterior margin. Mediotergite light brown with dense cover of yellowish gray pruinosity, indistinctly darker fronto-laterally. Pseudosutural fovea distinct, dark brown, surrounded by yellowish gray area. Pleuron dark brown, dusted with gray, meron yellowish. Dorsopleural membrane dark brown to blackish. Wing whitish, subhyaline, yellowish in prearcular area. Stigma distinct dark brown. Wing pattern very reduced, it consists of small spots at base of *Rs* and around *sc-r*. Narrow grayish brown areas surround cross-veins and branching points of veins. Veins pale grayish brown, pale yellow at wing base and in costal area. Venation typical for the genus, radial sector arcuate at base, *m-cu* slightly before middle of discal cell. Cell *m₁* long, 1.2 times as long as its stem. Anal vein slightly sinuous. Supernumerary cross-vein in cell *bm* slightly beyond level of *Rs* base and beyond tip of anal vein. Distal wing cells without macrotrichiae. Male wing narrow, not extended posteriorly, widest at the middle between tips of anal and *CuP* veins. Entire halter pale yellow. Male halter 1.0–1.2 mm long, female 1.2–1.3 mm. Fore coxa grayish brown with yellow distal margin, middle coxa obscure yellow with darker brown base, posterior coxa entirely obscure yellow. Trochanters yellow. Femur yellow, pale at base, widely dark brown at apex. Tibia yellow with narrowly darkened apex. Basal tarsomere brown, darker towards apex, remaining tarsomeres dark brown. Claw black. Male femur I: 4.8–4.9 mm long, II: 5.0–5.4 mm, III: 5.3–5.8 mm, tibia I: 5.2–5.3 mm, II: 5.0–5.2 mm, III: 5.8–6.1 mm, tarsus I: 5.9–6.4 mm, II: 4.7–5.9 mm, III: 5.0–5.2 mm. Female femur I: 4.4–5.3 mm long, II: 5.4 mm, III: 5.8 mm, tibia I: 4.7–5.1 mm, II: 4.5 mm, III: 6.2 mm, tarsus I: 4.8–6.4 mm, II: 4.6 mm, III: 5.1 mm. **Abdomen.** Tergites obscure yellow with widely grayish dark brown posterior margins and less distinct lateral margins. Sternites pale yellow with grayish brown posterior margins. Pregenital segment dark brown. Male genitalia dark reddish brown with rusty brown gonocoxite. Epandrium extended caudally, posterior margin slightly concave at middle, postero-lateral angle distinct, medial part slightly swollen and covered with erect setae. Gonocoxite elongate, 1.8 times as long as widest part, swollen at base of mesal surface, slightly constricted at middle. Outer gonostylus long and



narrow, with large apical hook and distinct serration that covers distal part, inner margin terminating in a right angle, outer margin without distinct crest. Inner gonostylus long and narrow with distinctly curved distal part, pale and setose with darkened inner margin. Mesal lobe of paramere with bulbous head bare of any setosity, lateral lobe short and wide with blackened apex. Aedeagus straight and short in dorsal view, reaching to about same level as apex of mesal process of paramere. Lateral projection of lower shelf slightly extended posteriorly, rounded. Lateral apodeme wide and comparatively short, approximately twice as long as wide. Sperm pump (vesica) ovoid. Apodeme of vesica directed anteriorly, short, triangle-shaped, grayish brown.

ELEVATION. From sea level up to 2400 m (Hubenov, 2017).

FLIGHT PERIOD. From April through to beginning of July.

HABITAT. Larvae developing in wet and marshy soils along river margins, usually surrounded by mountainous forests and shrublands, also in peatbogs (according to Savchenko, 1986). Associated with acid situations, it is found at small streams and hill drains (Stubbs, 2021).

GENERAL DISTRIBUTION. Widely spread through Europe (Austria, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Romania, Slovakia, Sweden, Switzerland, Ukraine, European part of Russia).

EXAMINED MATERIAL. One male (pinned), [Czech Republic], Moravia, Praděd B. Opava, July 4, 1968, J. Starý (BMNH); one male (pinned), [Czech Republic], Czechoslovakia, Moravia, Jeseníky Mts., near Olomouc, Jivova, June 17, 1973, S.J. Chambers, A.M. Hutson, B.M. 1973–373, NHMUK 013435915 (BMNH); two males (pinned), [Czech Republic], Czechoslovakia, Moravia, Jeseníky Mts., near Jeseník, Rejviz, June 19, 1973, S.J. Chambers, A.M. Hutson, B.M. 1973–373, NHMUK 013435909, NHMUK 013435910 (BMNH); one male (pinned), [Czech Republic], Czechoslovakia, Moravia, Jeseníky Mts., near Domasov, Vidly, June 21, 1973, S.J. Chambers, A.M. Hutson, B.M. 1973–373, NHMUK 013435908 (BMNH); two males, one female (pinned), Lithuania, Varena district, margin of river Skroblus, May 14, 1988, S. Podenas (VU); one female (in ethanol), Lithuania, Kaisiadorys district, Lapainia forest, May 30, 1994, V. Dobrovolskyte (VU).

80. *Eloeophila urania* (Speiser, 1923)

Limnophila urania Speiser, 1923: 88–89;

Eloeophila urania Oosterbroek, 2023.

DESCRIPTION. General. Body coloration dark brown, blackish. **Head.** Black, covered with blackish setae. Antenna dark brown. Scape elongate, cylindrical. Pedicel short, as long as widest part, widens towards apex, cone-shaped. Basal flagellomere short, approximately as long as pedicel, but not as wide, second to fifth flagellomeres short, distinctly swollen and covered with dense setosity on ventral side, bearing 2–3 verticils on dorsal. Remaining flagellomeres elongate. Rostrum and palpus black. **Thorax.** Uniformly dark blackish brown, covered with dark setosity. Wing brownish, with distinct dark brown pattern consisting of numerous spots and darkened areas surrounding cross-veins and branching points of veins. Venation: cell m_1 very short, only about 0.5 times as long as its stem, $m-cu$ at middle of discal cell. Halter dark brown. Legs covered with dense setae, tibial spurs



distinctly dark brown. **Abdomen.** Obscure yellow. Male genitalia light brown.

ELEVATION. Unknown.

FLIGHT PERIOD. Unknown.

HABITAT. Unknown.

GENERAL DISTRIBUTION. Congo.

EXAMINED MATERIAL. Not available.

REMARK. Type probably lost during the WWII.

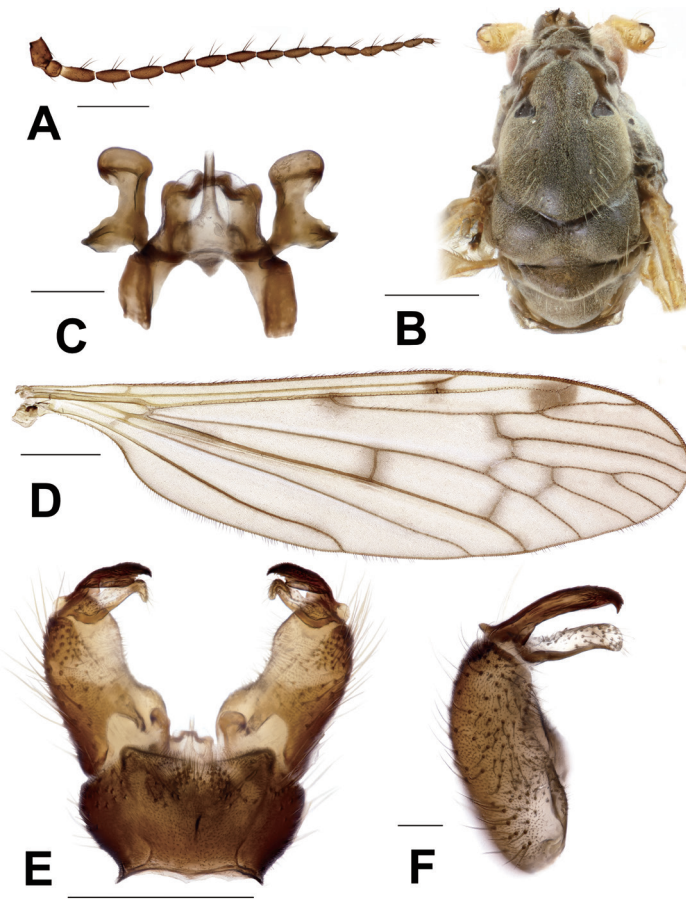


Fig. 85. *Eloeophila trimaculata* (Zetterstedt, 1838), male. **A.** Antenna; **B.** Thorax, dorsal view; **C.** Aedeagal complex, dorsal view; **D.** Wing; **E.** Genitalia, dorsal view; **F.** Gonocoxite with gonostyli, fronto-dorsal view. Scale bars: A, B, E = 0.5 mm; D = 1.0 mm; C, F = 0.1 mm.

81. *Eloeophila ussuriana iwatensis* (Alexander, 1936) (Fig. 86, Pl. 13B)

Limnophila (*Idioptera*) *ussuriana iwatensis* Alexander, 1936b: 187;

Eloeophila ussuriana iwatensis Nakamura, 2014: 13; Kato, 2021: 446–447; Oosterbroek, 2023.



DESCRIPTION. General. Body coloration black with gray pruinosity, ventral side of abdomen yellowish. Male body length 6.8–8.4 mm, female 7.1–10.0 mm, wing length of male 7.6–9.7 mm, female 7.0–10.2 mm. **Head.** Dark gray, narrowly light gray along eye margin. Vertex unmarked. Male antenna 2.6–2.8 mm long, reaching to about base of abdomen if bent backwards, shorter in female. Scape elongate, cylindrical, dark brown, bearing few long setae dorsally. Pedicel cup-shaped, brown, paler at base. Flagellum dark brown, basal half of first flagellomere yellowish to light brown. Flagellomeres elongate, apical segment comparatively small, only 0.7 times as long as preceding segment. Three basal segments slightly dilated ventrally. Longest verticils not reaching length of respective flagellomeres. Rostrum blackish brown. Palpus dark brown. **Thorax.** Pronotum brownish gray. Prescutum and presutural scutum gray, densely covered with pruinosity. Indistinct medial stripe visible only on anterior part of sclerite. Pseudosutural fovea rather distinct, dark grayish brown. Scutal lobe gray with indistinct brownish markings, area between lobes concolorous with lobe. Scutellum brownish gray, paler along posterior margin. Mediotergite light gray. Pleuron black, dusted with gray. Dorsopleural membrane dark brown, paler frontally. Wing grayish, subhyaline, yellowish at base and in costal area, pattern includes only indistinct darkening around cross-veins and dark brown oval stigma. Large dark brown spots and dots missing. Veins brownish gray, pale yellow at base, darker yellow in costal area. Venation typical for the genus: radial sector angulate and short-spurred at base, *m-cu* at about middle of discal cell. Cell m_1 long, 1.5 times as long as its stem. Anal vein slightly sinuous. It reaches wing margin slightly beyond level of supernumerary cross-vein in cell *bm*, base of radial sector far before level of supernumerary cross-vein. Macrotrichiae in apical cells missing. Male wing not expanded posteriorly, widest at middle between tips of anal and *CuP* veins. Male halter 1.3 mm long, stem pale yellow with brownish base, knob pale with brownish apex. Fore coxa dark brown, yellowish posteriorly, mid and hind coxae brownish yellow, slightly infusate basally. Trochanters brownish yellow. Fore and mid femora pale yellow at base, gradually turning dark brown from about middle towards apex, darker area on posterior femur covers only about one-fifth of its length. Tibia and basal tarsomere light brown with narrowly darkened tip. Remaining tarsomeres brown to dark brown. Claw black. Male femur I: 5.8 mm long, II: 6.0 mm, III: 6.5 mm, tibia I: 6.0 mm, II: 5.8 mm, III: 6.3 mm, tarsus I: 7.0 mm, II: 6.3 mm, III: 5.3 mm. **Abdomen.** Tergites generally dark brown or black, sometimes with brownish markings along lateral margins. Sternites brownish yellow with widely dark brown posterior margins. Pregenital segment black. Male genitalia black with dark brown gonocoxites. Epandrium slightly extended posteriorly, but posterior margin nearly straight, covered with short dense brownish setae. Gonocoxite slightly more than twice as long as width at middle, bearing large rounded ventro-mesal lobe. Outer gonostylus strongly elongate, with distinct apical hook, outer margin finely serrate distally, inner margin extended into large subapical angle. Inner gonostylus fleshy and setose, long and narrow, curved at apex. Mesal lobe of paramere rounded apically, not setose, lateral lobe triangle-shaped. Aedeagus straight and short in dorsal view, bifid at apex, not reaching to posterior margin of paramere. Lateral projection of lower shelf extended into angle, mesal extended into small, rounded bump along aedeagus. Lateral margin of lower shelf evenly rounded. Lateral apodeme short and wide, dark brown to black. Sperm pump (vesica) wider than longer. Apodeme of vesica directed anteroventrally, visible as darker rounded spot in dorsal view.

ELEVATION. From 600 m to nearly 1200 m.

FLIGHT PERIOD. From late April to middle of July.



HABITAT. Unknown.

GENERAL DISTRIBUTION. Japan (Hokkaido and Honshu Islands).

EXAMINED MATERIAL. Holotype, male (wing and genitalia slide-mounted), Japan, N. Honshu, Iwate-ken, Iwate-gun, altitude 914 m (3000 ft), June 21, 1935, H. Yamamoto (USNM); metatype, male (antenna, wing, leg and abdomen slide-mounted), Japan, Honshu, Akita-ken, Kuroyu, altitude 850 m, June 15, 1951, Issiki-Ito (USNM); two males (pinned), Japan, Hokkaido, Prov. Tokachi, Shikaribetsu, June 22, 1953, S. Kuwayama (USNM); one male (pinned), Japan, Okayama, Nawashirodani-gawa, Hiruzen-Kamifukuda, Maniwa-shi, altitude 600 m, April 29, 2016, D. Kato (NRC).

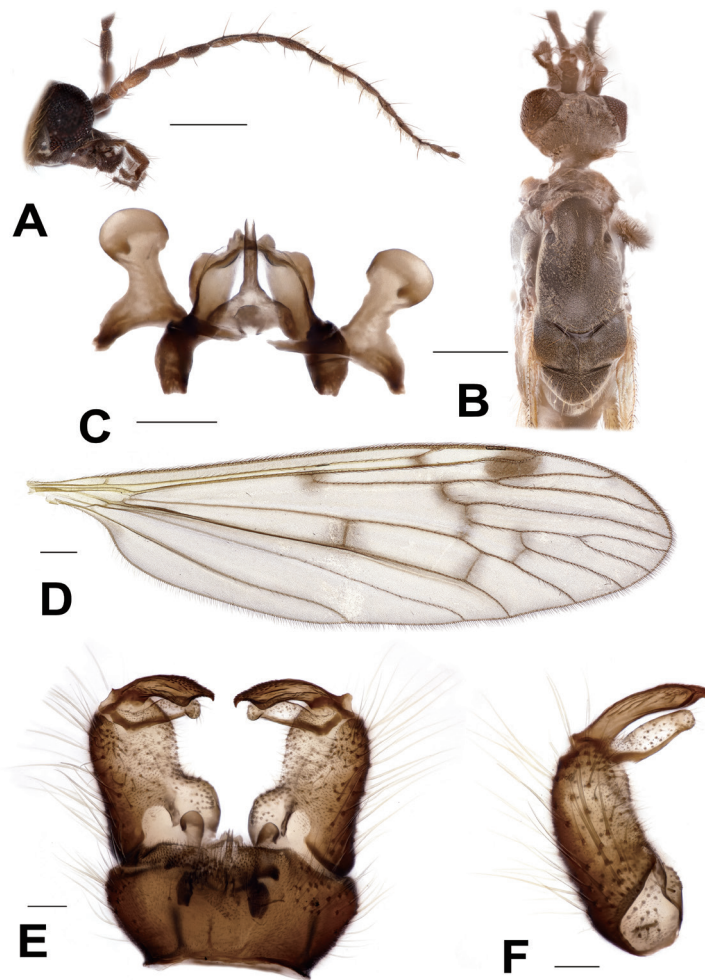


Fig. 86. *Eloeophila ussuriana iwatensis* (Alexander, 1936), male. **A.** Head, lateral view; **B.** Thorax, dorsal view; **C.** Aedeagal complex, dorsal view; **D.** Wing; **E.** Genitalia, dorsal view; **F.** Gonocoxite with gonostyles, fronto-dorsal view. Scale bars: A, B, D = 0.5 mm; C, E, F = 0.1 mm.

82. *Eloeophila ussuriana ussuriana* (Alexander, 1933) (Fig. 87, Pl. 13C)

Limnophila (*Idioptera*) *ussuriana* Alexander, 1933: 142;

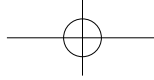
Eloeophila (*Eloeophila*) *ussuriana* Savchenko, Krivolutskaya, 1976: 62;

Eloeophila ussuriana Savchenko, 1983: 51–52; 1989: 85;

Eloeophila ussuriana ussuriana Podenas et al., 2020; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration dark brown to black, dusted with gray. Male body length 5.3–6.5 mm, wing length 7.5–9.0 mm. Female body length 6.5–9.5 mm, wing length 8.0–10.2 mm. **Head.** Dark brown, densely dusted with gray and covered with sparse short erect setae. Vertex without tubercle. Eyes widely separated in both sexes, distance between them at base of antennae slightly exceeds length of both basal antennomeres taken together. Antenna brown with yellow base of basal flagellomere and dark brown distal flagellomeres, 1.8–2.5 mm long in male, extending to base of abdomen, if bent backward, antenna of female 1.7–1.8 mm long. Scape dark brown, elongate, nearly cylindrical, twice as long as pedicel. Pedicel brown, widened distally. Flagellomeres elongate, narrower towards apex of antenna, densely covered with whitish pubescence. Apical segment subequal to preceding. Verticils dark brown, not reaching length of respective segments. Rostrum, palpus and mouth parts dark brown, dusted with gray. **Thorax.** Cervical sclerites and pronotum dark brown, densely dusted with gray. Mesonotal prescutum dark brown, dusted with gray, with four indistinct longitudinal stripes that are getting darker towards posterior margin of sclerite, medial pair narrowly separated with gray. Tubercular pits indistinct at frontal margin of sclerite, pseudosutural fovea distinct polished black. Scutal lobe grayish dark brown because of dense pruinosity. Area between lobes with sparser pruinosity, semi-polished. Scutellum with indistinctly reddish-brown posterior margin. Mediotergite brown with dense gray pruinosity, darker along middle. Pleuron uniformly dark brown, covered with dense brownish gray pruinosity. Wing iridescent with brownish tinge, yellowish at base. Stigma distinct, dark brown, elongate. Brownish spots surrounding branching points of veins and cross-veins. Veins light brown, yellowish at wing base. Venation: *Sc* long, reaching wing margin nearly at branching point of *Rs*, *sc-r* about three times its own length before tip of *Sc*. *Rs* long, slightly arched, sometimes angulate and short-spurred at base. Free end of *R*₁ short and oblique, *R*₂ indistinct, about three times its own length before tip of *R*₁, far beyond branching point of *R*₂₊₃ and *R*₄. *R*₃ and *R*₄ diverging, cell *r*₃ with long stem, which is approximately as long as *m-cu*. Cross-vein *r-m* distinct, at base of discal cell. Discal cell twice as long as wide. Cross-vein *m-cu* slightly before middle of discal cell. Additional cross-vein in cell *bm* beyond apex of anal vein. Anal vein long, distinctly arched apically, reaching wing margin at the level between base of *Rs* and additional cross-vein in cell *bm*. Anal angle long and narrow, widely rounded. Halter pale brownish yellow. Length of male halter 0.9–1.3 mm, that of female 1.1–1.3 mm long. Coxae yellow, brownish at base, more intensely on frontal pair. Trochanters yellow. Femur yellow, narrowly dark brown or black at apex. Tibia brownish yellow with narrowly dark brown apex. Basal tarsomere brown with yellowish base, remainder of tarsus dark brown. Tibia of foreleg with single apical spur, tibiae of middle and hind pairs of legs with two apical spurs each. Male femur I: 4.3–4.8 mm long, II: 4.5–5.0 mm, III: 5.5–5.7 mm, tibia I: 4.5–5.8 mm, II: 5.5–6.0 mm, III: 5.3–6.0 mm, tarsus I: 3.0–5.5 mm, II: 6.1–6.2 mm, III: 4.5–5.2 mm. Female femur I: 4.5–4.6 mm long, II: 4.5–4.6 mm, III: 4.5–5.5 mm, tibia I: 4.7–5.5 mm, II: 4.3–4.5 mm, III: 5.0–5.7 mm, tarsus I: 4.7–5.4 mm, II:





4.2–4.5 mm, III: 3.8–4.3 mm. Claw simple, without spines. **Abdomen.** Abdominal segments semi-polished, covered with sparse whitish erect setae. Tergites reddish brown at base and along middle, widely dark brown laterally and posteriorly in male. Female tergites uniformly dark brown. Sternites dark brown, narrowly grayish along posterior margin, marked with yellowish at base of Abdomen. Male terminalia dark brown. Ninth tergite rectangular, wider than longer, posterior margin nearly straight, setose at middle. Gonocoxite elongate with large rounded ventro-mesal bump at base. Outer gonostylus elongate, sclerotized, serrated along distal half of outer margin, widened distally, apex claw-shaped. Inner margin slightly widened at distal half, without prominent subapical angle. Inner gonostylus long and narrow, fleshy and setose. Mesal lobe of paramere slightly widened and curved posteriorly, without any setae, lateral lobe short, blunt-apexed. Aedeagus straight and short in dorsal view, bifid at apex, far not reaching to posterior margin of paramere. Lateral projection of lower shelf rounded, mesal extended along aedeagus. Lateral margin of lower shelf angulate. Lateral apodeme short and wide, darkened. Sperm pump (vesica) oval. Apodeme of vesica directed anteroventrally, visible as indistinct darkening in dorsal view. Ovipositor dark brown at base, turning yellowish towards apex. Cercus long, narrow and slightly arched, blunt-apexed. Hypoalva long and straight, point-apexed, reaching two-thirds of cercus length.

ALTITUDE IN KOREA. From sea level to more than 1200 m.

FLIGHT PERIOD. From early May through June.

HABITAT. Unknown in Korea, adults are active among grassy vegetation along streams and rivulets in the forests, near canals and holes filled with water in the Far East of Russia close to the border with North Korea, sanctuary Kedrovaya Padj (Savchenko, 1983).

GENERAL DISTRIBUTION. North Korea and Far East of Russia.

EXAMINED MATERIAL. Holotype (as *Limnophila (Idioptera) ussuriana*), male (antenna, gonocoxite with gonostyli slide-mounted), Eastern Siberia (Ussuri), Tigrowaja, Suchan district, June 9, 1927, Stackelberg (USNM); allotype, female (antenna and wing slide-mounted together with holotype) (USNM); metatypes (as *Limnophila ussuriana*), male and female (on same pin, female with missing tip of abdomen), North Korea, Ompo, June 8, 1937, A.M. Yankovsky (USNM); three males (pinned), North Korea, Ompo, altitude 52 m (170 ft), June 7, 1937, A.M. Yankovsky (USNM); two males, one female (pinned), North Korea, Ompo, June 8, 1937, A.M. Yankovsky (USNM); two males (genitalia of one male in microvial with glycerol), one female (pinned), [N.] Korea, Ompo, altitude 183 m (600 ft), May 8, 1938, A.M. Yankovsky (USNM); two males (pinned), North Korea, Ompo, altitude 91 m (300 ft), May 9, 1938, A.M. Yankovsky (USNM); four males, two females (pinned), [N.] Korea, Ompo, altitude 213 m (700 ft), May 9, 1938, A.M. Yankovsky (USNM); two males, two females (pinned), North Korea, Ompo, altitude 46 m (150 ft), May 12, 1938, A.M. Yankovsky (USNM); one female (pinned, ovipositor in microvial with glycerol), [N.] Korea, Ompo, altitude 61 m (200 ft), May 12, 1938, A.M. Yankovsky (USNM); one female (pinned), [N.] Korea, Ompo, altitude 183 m (600 ft), May 18, 1938, A.M. Yankovsky (USNM); one female (pinned), [N.] Korea, Ompo, altitude 61 m (200 ft), May 24, 1938, A.M. Yankovsky (USNM); one male (pinned), North Korea, Ompo, altitude 122 m (400 ft), May 29, 1938, A.M. Yankovsky (USNM); one male (pinned), North Korea, Ompo, altitude 91 m (300 ft), May 29, 1938, A.M. Yankovsky (USNM); two males (pinned), [N.] Korea, Ompo, altitude 91 m (300 ft), June 6, 1938, A.M. Yankovsky (USNM); two males (pinned), North Korea, Ompo, altitude 183 m (600 ft), June 11, 1938, A.M. Yankovsky (USNM); one male, one specimen with broken abdomen (pinned), North Korea, Ompo, altitude



107 m (350 ft), June 11, 1938, A.M. Yankovsky (USNM); two females (pinned), [N.] Korea, Ompo, altitude 183 m (600 ft), June 11, 1938, A.M. Yankovsky (USNM); two males (pinned), North Korea, Seren Mts., altitude 1219 m (4000 ft), June 25, 1938, A.M. Yankovsky (USNM).

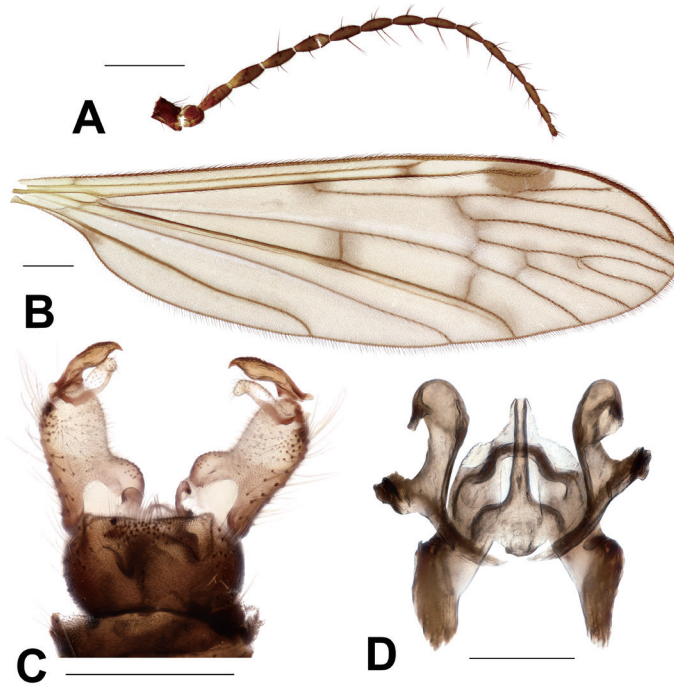


Fig. 87. *Eloeophila ussuriana ussuriana* (Alexander, 1933), male. **A.** Antenna; **B.** Wing; **C.** Genitalia, dorsal view; **D.** Aedeagal complex, dorsal view. Scale bars: A - C = 0.5 mm; D = 0.1 mm.

83. *Eloeophila venaguttula* (Alexander, 1934) (Fig. 88, Pl. 13D)

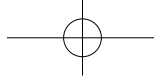
Limnophila (*Elaeophila*) *venaguttula* Alexander, 1934a: 53–55; 1964: 360;

Limnophila venaguttula Wood, 1952: 239–240;

Eloeophila venaguttula Oosterbroek, 2023.

DESCRIPTION. General. Body coloration rusty brown. Male body length 6.2–6.4 mm, female body length 6.7–6.8 mm, male wing length 6.9–7.3 mm, female 7.4–8.4 mm. **Head.** Brown, narrowly yellow along eye margin, with narrow dark brown median line, covered with sparse yellowish setae. Female antenna 1.1–1.3 mm long, nearly reaching to frontal margin of prescutum if bent backwards. Scape long and narrow, grayish brown, sparsely dusted with yellowish and bearing few long setae. Pedicel subglobular, brownish yellow, covered with few dark brown short setae. Flagellum brown at base, dark brown at distal end, base of first flagellomere yellowish. Five basal flagellomeres oval, covered with short pale pubescence, remaining segments elongate. Longest verticils 1.3 times as long as respective flagellomeres. Apical flagellomere large, slightly exceeds preceding segment in length. Rostrum and palpus brown. **Thorax.** Pronotum brownish yellow, pale





yellow along margin, with brown spot dorsally and brown stripe laterally, postpronotum pale yellow. Prescutum and presutural scutum orange brown with four indistinct darker longitudinal stripes. Lateral margin of sclerite narrowly darkened. Pseudosutural fovea brownish. Scutal lobe brownish yellow with indistinct darker brown spot in the middle. Area between lobes concolorous with lobe. Scutellum brownish yellow, slightly darker anteriorly. Mediotergite yellow with brown medial line. Pleuron obscure yellow with three narrow castaneous brown stripes and brown ventral margin of katepisternum. Dorsopleural membrane pale yellow. Wing grayish, subhyaline, yellowish at base and along costal margin, patterned with numerous brownish dots along longitudinal veins and narrow darker areas surrounding cross-veins. Subcostal vein without dots except apex. Stigma indistinct. Veins yellow, grayish brown in darkened areas. Venation differs from other *Eloeophila* species, base of radial sector closer to base of wing, cord nearly at wing middle, thus distal longitudinal veins longer than usual, cross-vein m-m closer to wing margin, extending and distorting discal cell; radial sector arcuate at base, *m-cu* slightly before middle of discal cell's length. Cell m_1 long, 1.7 times as long as its stem. Anal vein angulate and short-spurred subapically, right before wing margin. It reaches wing margin far beyond level of supernumerary cross-vein in cell *bm*, just slightly before the level of base of discal cell. Base of radial sector distinctly before supernumerary cross-vein in cell *bm*. Distal wing cells without macrotrichiae. Male wing narrow, not widened at posterior margin, widest at tip of vein *CuP*. Female halter 1.2–1.3 mm long. Stem of halter brownish, darker at base, knob pale. Coxae castaneous brown with narrow obscure yellow subapical ring. Trochanters obscure yellow anteriorly, brown posteriorly. Femur light yellow, pale at base, indistinctly darkened at distal end. Tibia and two basal tarsomeres light yellow with narrowly infusate apices. Remaining tarsomeres brown. Claw brown. Female femur I: 3.9 mm long, tibia I: 4.8 mm, tarsus I: 4.2 mm, II: 4.0–4.2 mm. **Abdomen.** Uniformly brown, sparsely dusted with obscure yellow and covered with sparse short yellowish setae. Male genitalia brown. Posterior margin of epandrium slightly extended with small concavity at middle. Gonocoxite elongate, about twice as long as widest part at base, narrows apically, without ventro-mesal lobe. Outer gonostylus long and narrow with distinct apical spine, outer margin smooth, without crest or serration, inner margin with small subapical angle below the spine. Inner gonostylus large, distinctly exceeds outer gonostylus in length, fleshy and setose, wide at base, narrow at tip. Paramere with long, narrow, slightly curved mesal lobe lacking any setae, lateral lobe strongly reduced. Aedeagus straight and very short in dorsal view, far not reaching apex of mesal process of paramere. Lateral projection of lower shelf indistinct, median projection extends along aedeagus. Lateral apodeme very large, plate-shaped. Sperm pump (vesica) elongate, oval. Apodeme of vesica directed anteriorly, fan-shaped. Ovipositor with short fleshy cercus, what is unusual for the rest of the genus.

ELEVATION. Unknown.

FLIGHT PERIOD. From end of October through January.

HABITAT. Forest (Wood, 1952).

GENERAL DISTRIBUTION. South Africa

EXAMINED MATERIAL. Paratype, male (wing and genitalia slide-mounted), South Africa, Humansdorp, Coldstream, Cape Colony, January 1921, R. Tucker (USNM); two females (pinned, wing slide-mounted), South Africa, Cape Province, Coldstream, Tsitsikama area, October 25–28, 1964, B. & P. Stuckenberg (Naturalis, RMNH.INS. 1543987–8).



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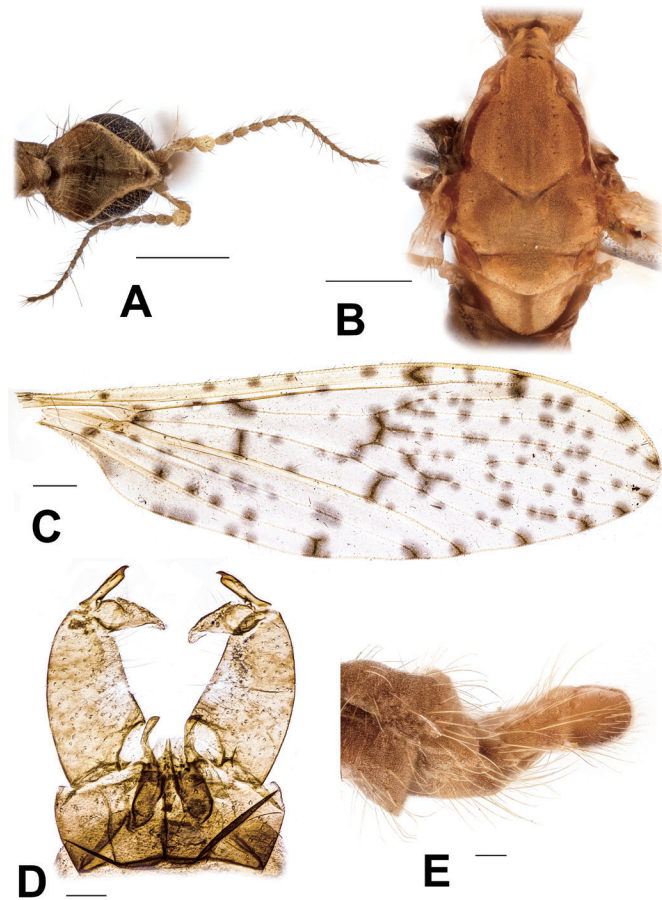


Fig. 88. *Eloephila venaguttula* (Alexander, 1934). **A.** Female head, dorsal view; **B.** Female thorax, dorsal view; **C.** Male wing; **D.** Male genitalia, dorsal view; **E.** Ovipositor, lateral view. Scale bars: A–C = 0.5 mm; D, E = 0.1 mm.

84. *Eloephila vernata* (Alexander, 1927) (Fig. 89)

Limnophila (*Ephelia*) *vernata* Alexander, 1927a: 59–60;

Limnophila (*Elaeophila*) *vernata* Alexander, 1943b: 387;

Eloephila vernata Oosterbroek, 2023.

DESCRIPTION. General. Body coloration gray with reddish brown Abdomen. Male body length 4.0–4.3 mm, female 5.3 mm, male wing length 4.8–5.5 mm, that of female 5.8 mm. **Head.** Dark brownish gray. Male antenna relatively long. Scape dark brown, basal half of flagellum obscure yellow to yellowish brown, distal darker brown. Rostrum and palpus dark brown. **Thorax.** Prescutum and presutural scutum gray with four narrow brown longitudinal stripes and darkened lateral margin. Medial stripe confluent with lateral stripe behind pseudosutural suture. Interspace with few dark dots. Pleuron gray, variegated with brown. Wing grayish to brownish, subhyaline, yellowish at base, patterned with eight dark brown spots along frontal margin, remaining area



covered with small abundant grayish spots. Spots at frontal margin wider than interspaces. Stigma dark brown. Narrow grayish brown areas surround cord, distal margin of discal cell, cross-veins and branching points of veins. Veins brown, brownish yellow at wing base. Venation typical for the genus: radial sector angulate and short-spurred at base, *m-cu* at about one-fourth of discal cell's length. Cell *m*₁ long, slightly longer than its stem. Anal vein slightly sinuous, just slightly arched at tip. It reaches wing margin slightly beyond level of supernumerary cross-vein in cell *bm*, base of radial sector distinctly before supernumerary cross-vein. Distal wing cells without macrotrichiae. Male wing narrow, not widened at posterior margin, widest at tip of vein *CuP*. Stem of halter yellow, knob dark brown. Coxa gray, variegated with brown. Trochanter obscure yellow. Femur obscure yellow, narrowly and indistinctly darkened at distal part. Tibia and basal tarsomeres brownish yellow, distal tarsomeres darker. **Abdomen.** Reddish brown, caudal margins of segments darker brown. Male genitalia brown. Posterior margin of epandrium rounded. Gonocoxite elongate, approximately twice as long as widest part at base. Outer gonostylus plate-shaped, nearly parallel-sided with strong claw-shaped apical spine. Outer margin with low crest extended into apical spine, inner margin with rounded subapical emargination. Inner gonostylus pale, fleshy and setose. Aedeagus straight in dorsal view. Lateral apodeme long and narrow. Sperm pump (vesica) wider than longer. Blackened apodeme of vesica bifid.

ELEVATION. Unknown.

FLIGHT PERIOD. From late April (?middle of April) through to early June.

HABITAT. Unknown.

GENERAL DISTRIBUTION. USA (North Carolina, Virginia).

EXAMINED MATERIAL. Paratype, male (wing and genitalia slide-mounted), USA, North Carolina, Guilford Co., Guilford College, April 15, 1918, J.S. Rogers (USNM); one specimen with unclear sex (pinned), USA, Virginia, Arlington Co., May 7, 1938, A.B. Gurney (USNM).

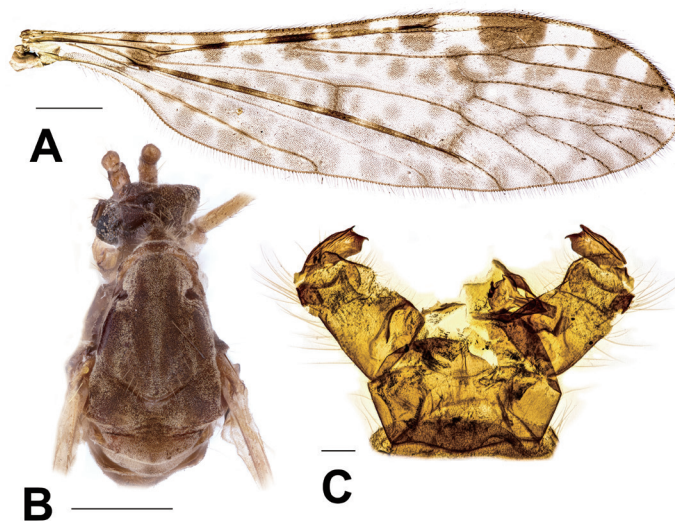


Fig. 89. *Eloeophila vernata* (Alexander, 1927), male. **A.** Wing, paratype; **B.** Thorax, dorsal view; **C.** Male genitalia, dorsal view, paratype. Scale bars: A, B = 0.5 mm; C = 0.1 mm.



85. *Eloeophila verralli* (Bergroth, 1912) – Seven-spotted Linkwing (Fig. 90, Pl. 13E)

Ephelia verralli Bergroth, 1912: 134–136; Nielsen, 1925: 68; Cziżek, 1931: 121;
Idioptera dalei Edwards, 1921: 221–222;
Idioptera marmorata var. *verralli* Edwards, 1921: 221;
Ephelia dalei Meijere, 1921: 59; Cziżek, 1931: 121, 125; Pierre, 1924b: 118; Lackschewitz, 1940: 72;
Limnophila (Eloeophila) verralli Edwards, 1938: 78; Coe, 1950: 41;
Elaeophila verralli Brindle, 1958: 60, 64; 1967: 20; Brindle, Bryce, 1960: 215;
Eloeophila (Eloeophila) verralli Ujvarosi, 2007: 230;
Eloeophila verralli Savchenko, 1986: 310; 1989: 85; Podenas, 1995: 39; Starý, Geiger, 1998: 74; Schacht, 1999: 131, 134; 2005: 5; Pakalniskis et al., 2000: 6; 2006: 19; Reusch, Oosterbroek, 2000: 155; Petersen, Jong, 2001: 149; Eiroa, Baez, 2002: 54; Jong, Oosterbroek, 2002; Podeniene, 2003a: 82, 124, 142, 175, 267; 2003b: 28; Oosterbroek, Simova-Tosic, 2004: 445; Starý, 2004; 2009a: 428, 430, 434, 435; Chaniecka, Wiedenska, 2006: 147; Podenas et al., 2006: plate 49; Wiedenska, 2007: 75; 2014: 12; 2017: 13; Kramer, 2011: 18; Dufour, Merz, 2012: 354; Salmela, 2012a: 237; 2012b: 11; Salmela, Petrasius, 2014: 27; Boardman, 2016: 130; Brighton, 2017: 27, 36; Hubenov, 2018: 15; 2021: 30; Olsen et al., 2018: 158, 159; Stuke, 2019: 142; Quindroit, 2020a: 30, 41, 47; Kolcsar et al., 2021: 96–97; Kramer, Morris, 2022: 6; Oosterbroek, 2023.

DESCRIPTION. General. Body coloration brownish gray. Male body length 5.7–7.0 mm, female 9.1 mm, male wing length 7.0–8.0 mm, female 9.6 mm. **Head.** Brownish gray or dark gray with a small black spot fronto-dorsally, narrowly light gray along eye margin, covered with sparse light brown setae. Antenna short, not reaching base of wing if bent backwards, fuscous to dark testaceous. Female antenna 1.5 mm long. Three basal flagellomeres of male antenna oval, remaining segments elongate. Female flagellomeres shorter than in male. Scapal segment elongate, sub-cylindrical, dark brown, densely dusted with gray. Pedicel subglobular. Palpus brownish testaceous. **Thorax.** Gray. Pronotum brownish gray with dark brown medial stripe. Prescutum and presutural scutum gray with two indistinct darker brown longitudinal stripes. Scutal lobe brownish gray with dark brown spot in the middle. Area between lobes light gray with dark brown medial line that extends onto scutellum. Posterior margin of scutellum darker gray, whole dorsal surface light gray. Mediotergite light brownish gray. Pseudosutural fovea distinct, black, semi-polished. Pleuron light gray with irregular darker brown spots. Wing grayish, subhyaline, yellowish at base, pattern consists of seven fairly evenly spaced dark spots along the front margin, other markings being relatively inconspicuous. Narrow grayish areas surround cross-veins and branching points. Stigma brown. Veins brownish yellow, pale yellowish at wing base and in costal area. Venation typical for the genus, radial sector arcuate at base, *m-cu* slightly before middle of discal cell. Cell m_1 long, 1.8 times as long as its stem. Anal vein slightly sinuous. It reaches wing margin distinctly beyond level of supernumerary cross-vein in cell *bm*, base of radial sector distinctly before supernumerary cross-vein. Distal wing cells with macrotrichiae. Male wing narrow, not dilated along posterior margin, widest at tip of vein *CuP*. Female halter 1.2 mm long. Stem of halter yellow with brownish base,



knob pale ventrally, dark brown distally. Coxae and trochanters testaceous. Femur brown, with pale yellow base, often grading to a darker color at the apex which is almost black, but without distinct apical dark ring. Tibia brownish yellow with narrowly darker brown base and apex. Basal tarsomere brownish yellow, darkened distally. Remaining tarsomeres brown to dark brown. **Abdomen.** Semi-polished, grayish dark brown. Tergites with narrowly gray posterior margin. Ninth segment of male entirely dark brown with lighter brown gonocoxite. Epandrium with small emargination at middle of posterior margin. Gonocoxite elongate, 2.6 times as long as widest part at base, moderately arched, basal part slightly enlarged. Outer gonostylus elongate, terminating in a curved claw-shaped spine, outer margin serrate at distal half, inner margin with low subapical angle. Crest on outer margin extended into long terminal spine. Inner gonostylus light brown with dark brown inner margin at basal two-thirds, setose, narrows towards blunt apex. Paramere with long, blade-shaped, blunt-apexed mesal lobe that lacks any setae, lateral lobe narrow, bifid at tip, dark brown. Aedeagus straight and very long in dorsal view, reaching far beyond apex of mesal process of paramere. Lateral projection of lower shelf missing, mesal projection extends along aedeagus. Lateral apodeme long and narrow, blackened. Sperm pump (vesica) oval. Apodeme of vesica long, peg-shaped, dark brown.

ELEVATION. From sea level to 1300 m.

FLIGHT PERIOD. From May through July.

HABITAT. Species is mainly confined to acid districts with sandy sediment in small, wooded streams, often with alders present (Stubbs, 2021); irrigated meadows with peat, streams covered with old trees.

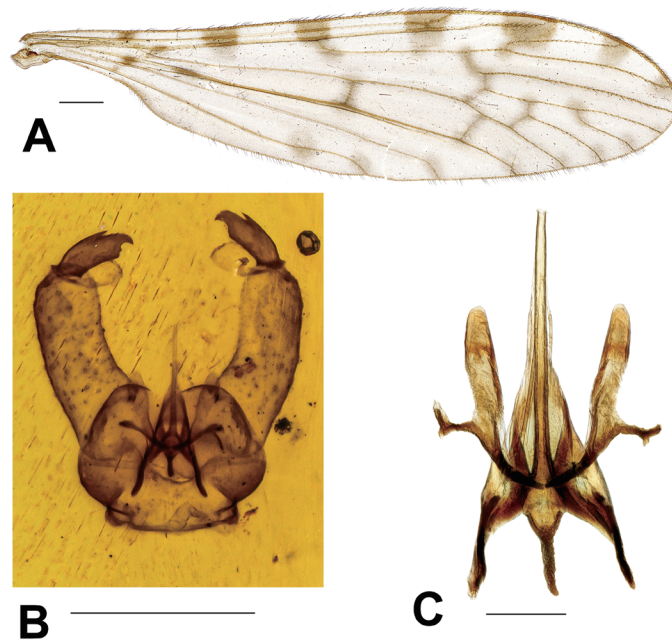


Fig. 90. *Eloeophila verralli* (Bergroth, 1912), male. **A.** Wing; **B.** Genitalia, dorsal view, holotype of *E. dalei*, syn. of *E. verralli*; **C.** Aedeagal complex, dorsal view. Scale bars: A, B = 0.5 mm; C = 0.1 mm.



GENERAL DISTRIBUTION. Widely spread through Europe (Bulgaria, Czech Republic, Denmark, Finland, France (including Corsica), Germany, Great Britain, Hungary, Latvia, Lithuania, Netherlands, North Macedonia, Poland, Romania, Serbia, Slovakia, Spain, Switzerland, European part of Russia).

EXAMINED MATERIAL. Holotype, male (glued to cardboard, on pin), Britain, G.C. Dale, 62.17 (BMNH(E) #235023); one female (in ethanol, wing slide-mounted), Switzerland, Ticino, Genestrerio, July 30 –August 5, 1979, C. Dufour, W. Geiger, Malaise trap (MHNN); one male (in ethanol, wings and genitalia slide-mounted), France, 4 km E Bourg-Madame (Ste Léocadie), altitude 1280 m, June 19, 1991, irrigated meadow with peat, stream covered with old trees (MHNN); one female (in ethanol), Lithuania, Kaisiadorys district, Strosunai forest, June 16, 1995, S. Podenas (VU).

86. *Eloeophila verrucosa* Savchenko, 1976 (Fig. 91)

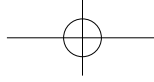
Eloeophila (Eloeophila) verrucosa Savchenko and Krivolutskaya, 1976: 60;

Eloeophila verrucosa Savchenko, 1989: 86; Nakamura, 2014: 13; Kato, 2021: 447; Oosterbroek, 2023.

(Redescription based on Savchenko and Krivolutskaya (1976)).

DESCRIPTION. General. Body coloration dark brown, ventral side of abdomen obscure yellow. Male body length 5.5 mm, wing length 6.0 mm. **Head.** Dark brown, dusted with gray, densely covered with yellow setae. Antenna dark brown, reaching slightly beyond base of wing if bent backwards. Flagellomeres elongate, spindle shaped, covered with very long light pubescence and sparse stout setae. Rostrum and palpus dark brown. **Thorax.** Dark brown, covered with sparse gray pruinosity. Prescutum and presutural scutum without darker areas. Katepisternum setoseless. Wing brownish, subhyaline, not patterned except indistinct darker brown stigma. Veins brownish yellow. Venation typical for the genus: radial sector arcuate at base, *m-cu* slightly before middle of discal cell. Cell *m₁* long, but comparative length varies individually from nearly as long as its stem to nearly twice as long as its stem. Anal vein slightly sinuous. Halter pale yellow. Fore coxa dark brown anteriorly, obscure yellow posteriorly, middle and hind pairs of coxae obscure yellow. Trochanters obscure yellow. Femur dark brown with obscure yellow base. Tibiae and tarsi dark brown. Legs covered with long semi-erect setae. **Abdomen.** Tergites dark brown, sternites obscure yellow. Posterior margin of eighth tergite with long and narrow densely setose extension partly covering epandrium. Male genitalia distinctly swollen, dark brown. Epandrium distinctly wider than longer, posterior margin with elongate rectangular extension at middle, that is covered with numerous small black spines, apex with small, rounded incision. Gonocoxite comparatively short, only 1.3 times as long as widest part at base, bearing one ventro-mesal and three dorsal appendages covered with dense setae. Outer gonostylus long and narrow with small apical hook and serrate outer margin, bearing large serrate subbasal lobe. Inner gonostylus bifid, fleshy and setose, blunt-apexed. Proctiger unusually long, sausage-shaped, slightly curved and covered with microscopic setulae. Mesal lobe of paramere plate-shaped, slightly narrows apically, setoseless, lateral lobe small, blackened at tip. Aedeagus straight but very short, far not reaching to posterior margin of paramere.





ELEVATION. Unknown.

FLIGHT PERIOD. June.

HABITAT. Marshy opening in the mixed forest near small stream. Adults hiding in dense high grassy vegetation.

GENERAL DISTRIBUTION. Kuril Islands (Russia).

EXAMINED MATERIAL. Not available. Type series in the Zoological Museum in Kiev, Ukraine.

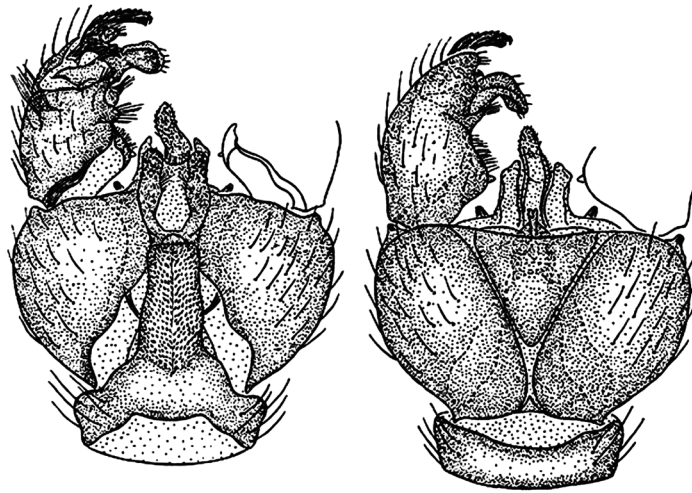


Fig. 91. *Eloeophila verrucosa* Savchenko, 1976, male genitalia. **A.** Dorsal view; **B.** Ventral view (after Savchenko and Krivolutskaya, 1976).

87. *Eloeophila villiersi* (Alexander, 1958) (Fig. 92)

Limnophila (*Elaeophila*) *villiersi* Alexander, 1958a: 129–131;

Eloeophila villiersi Oosterbroek, 2023.

DESCRIPTION. General. Body coloration brown to grayish brown. Male body length 5.5 mm, wing length 5.5–6.0 mm. **Head.** Dark gray. Antenna 1.2 mm long, light yellow. Scape elongate, subcylindrical, pedicel subglobular. Flagellomeres oval, five basal flagellomeres slightly swollen on ventral side. Longest verticils slightly exceed length of respective segments. Rostrum dark brown. Palpus black. **Thorax.** Pronotum brownish gray. Prescutum and presutural scutum reddish brown to brownish gray with four indistinct darker brown longitudinal stripes. Medial and lateral stripes separated by wide interspace. Scutal lobe with darker brown central spot. Scutellum and mediotergite brownish gray with medial dark stripe. Pleuron brownish gray, widely dark brown dorsally, gray ventrally, with distinct longitudinal dark brown stripe. Wing brownish, subhyaline, patterned with narrow transverse, partly broken dark brown sutures at level of humeral vein, at base of *Rs* – supernumerary cross-vein in cell *bm* – tip of anal vein, at cord and at wing tip. Small spots at wing



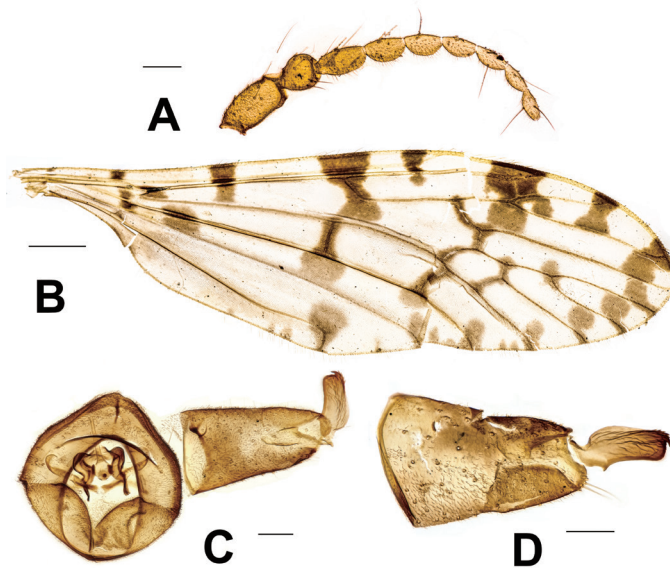


Fig. 92. *Eloeophila villiersi* (Alexander, 1958), male, paratype. **A.** Basal segments of antenna; **B.** Wing; **C.** Ninth segments, aedeagal complex, gonocoxite with gonostyli, frontal view; **D.** Gonocoxite with outer gonostylus. Scale bars: A, C, D = 0.1 mm; B = 0.5 mm.

base, at frontal margin between arculus and base of *Rs*, at *sc-r* and at base of cell *m*₁. Few indistinct small dots distributed along posterior wing margin. Veins brownish, distinctly yellowish at wing base and along costal area. Venation typical for the genus: radial sector arcuate at base, *m-cu* slightly beyond base of discal cell. Cell *m*₁ long, 2.2 times as long as its stem. Anal vein slightly arched at middle with strongly curved and short-spurred apex. Apical cells without macrotrichiae. Male wing widened posteriorly, widest at tip of anal vein. Stem of halter brownish yellow, knob dark brown. Coxae dark brown, trochanters obscure yellow. Femora and tibiae light yellow, without darkening, except black tibial spurs. Male femur III: 4.3 mm long, tibia III: 3.9 mm. **Abdomen.** Brown, posterior and lateral margins of segments darkened. Male genitalia yellowish brown. Gonocoxite elongate, nearly twice as long as widest part at base. Outer gonostylus elongate, nearly rectangular with small apical hook, outer margin with low crest and serrate distal part, inner margin slightly curved, nearly smooth with distinct subapical angle. Inner gonostylus elongate, fleshy and setose, narrowed towards tip. Mesal lobe of paramere elongate, curved at distal end, setoseless, lateral lobe short and narrow, darkened. Aedeagus straight and long. Sperm pump (vesica) subglobular, apodeme of vesica small and dark.

ELEVATION. Unknown.

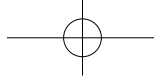
FLIGHT PERIOD. Middle of April.

HABITAT. Unknown.

GENERAL DISTRIBUTION. The Republic of Guinea.

EXAMINED MATERIAL. Paratype, male (antenna, wing, hind leg and abdomen slide-mounted), French Gvinea, Grotte de Parachutistes, April 17, 1954, A. Villiers (topotypic) (USNM).





88. *Eloeophila woodgatei* (Alexander, 1946) (Fig. 93A)

Limnophila (*Elaeophila*) *woodgatei* Alexander, 1946a: 519–520;
Eloeophila woodgatei Oosterbroek, 2023.

DESCRIPTION. *Female. General.* Body coloration gray, abdomen bicolorous, obscure yellow with dark brown posterior margins of segments. Female body length 9.0 mm, wing length 8.2–8.5 mm. **Head.** Gray, vertex with wide dark medial spot. Scapal segment of antenna black, covered with pruinosity, second antennomere rusty brown, flagellum yellow. Rostrum black, covered with sparse pruinosity. Palpus black. **Thorax.** Pronotum gray with dark medial and lateral stripes, postpronotum more yellowish. Prescutum and presutural scutum gray with conspicuous darker brown stripes and spots. Medial stripes converge together anteriorly, they are less distinct caudally, both stripes separated by line of ground color which is as wide as stripe itself. Lateral stripe narrow. Interspace with line of small dark dots posteriorly, the largest reaching suture. Lateral margin of sclerite darkened beyond pseudosutural fovea. Scutal lobe gray with dark brown spot. Area between lobes paler gray with dark brown spot posteriorly extending onto scutellum but not reaching its posterior margin. Laterotergite gray. Mediotergite light gray with narrow dark medial line. Paratergite pale yellow, pseudosutural fovea distinct, black. Pleuron gray with conspicuous irregular dark brown spots, katepisternum and meron chiefly dark brown, dorsopleural membrane blackish. Wing milkish, subhyaline, yellowish at prearcular area, patterned with numerous large dark brown spots and abundant grayish brown dots in all cells. Stigma oval, dark brown with yellowish central area. Frontal wing margin with six large spots and smaller spot at arculus. Dark spots surrounding base of *Rs* – supernumerary cross-vein in cell *bm*, along cord and before wing tip making three complete crossbands. Distal margin of discal cell surrounded by narrow darkening, wing tips at posterior wing margin surrounded by less distinct grayish spots. Dark dots distributed along veins and in cells. Veins brownish to yellowish, dark brown in darkened areas. Venation typical for the genus: radial sector long and arcuate at base, *m-cu* at middle of discal cell. Supernumerary cross-vein in cell *bm* beyond level of base of *Rs* and before tip of anal vein. Cell *m₁* long, subequal to its stem. Anal vein slightly arched before wing margin. Distal wing cells without macrotrichiae. Stem of halter yellow, knob darkened. Coxa dark brown covered with gray pruinosity, trochanter obscure yellow. Femur obscure yellow, brighter yellow beyond middle, with conspicuous black apical ring. Tibia light yellow with darkened tip. Basal tarsomeres yellow, distal brownish. Female femur III: 5.4 mm long, tibia III: 5.7, tarsus III: 3.4 mm. **Abdomen.** Anterior part of tergite brownish yellow with indistinct transverse brownish suture, caudal narrowly but distinctly dark brown, posterior margin narrowly pale gray. Sternite obscure yellow with widely dark brown posterior margin and less distinct darkening along lateral margin. Tenth tergite of female abdomen brownish yellow, cercus light yellow hypovalva darker brown with yellow distal portion. *Male.* Unknown.

ELEVATION. Close to 2000 m.

FLIGHT PERIOD. June.

HABITAT. Unknown.

GENERAL DISTRIBUTION. USA (New Mexico).

EXAMINED MATERIAL. Holotype, female (wing and hind leg slide-mounted), USA, New Mexico, Jemez Springs, altitude 1951 m (6400 ft), June 12, 1916, J. Woodgate (USNM).



REMARK. *E. woodgatei* was described from single female. Description mentions that it differs from *E. edentata* by longer vein R_{2+3+4} and larger discal cell. On the other hand, venation of *E. edentata* is variable, while most specimens have “typical” discal cell, some males have much smaller discal cell and some females, flying at the same time and in the same place, have much larger discal cell (Fig. 93B, C).

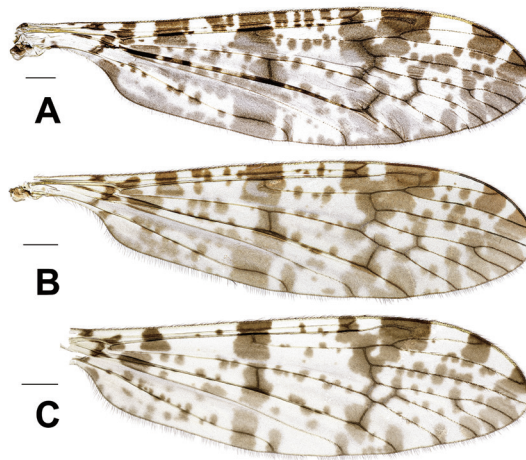


Fig. 93. *Eloeophila* from SW of the USA. **A.** *E. woodgatei* (Alexander, 1946), female wing, holotype (New Mexico); **B.** *E. edentata* female (Arizona); **C.** *E. edentata* male (Arizona). Scale bars: 0.5 mm.

89. *Eloeophila koreana* sp. nov. (Fig. 94, Pl. 13F)

DIAGNOSIS. Medium-sized yellowish brown species. Head dark grayish brown, antenna with yellow flagellum. Prescutum and presutural scutum with four distinct dark brown stripes. Pleuron brown, halter pale yellow, legs obscure yellow. Wing pattern includes six larger dark brown spots at frontal margin, distinct stigma, dark areas surrounding cross-veins and branching points of veins, less distinct grayish spots at tips of longitudinal veins at wing margin. Small spots or dots in cells and along veins missing. Abdomen yellow with darkened pregenital segment. Male genitalia with strongly extended inner margin of outer gonostylus, short and wide aedeagus, large, arched paramere, sperm pump bearing peg-shaped apodeme.

ETYMOLOGY. Species is named after the country of its distribution, Korea.

DESCRIPTION. General. Body coloration yellowish brown. Male body length 4.2–5.1 mm, that of female 7.6 mm, male wing length 4.7–5.9 mm, female 6.7 mm. **Head.** Dark grayish brown, paler along eye margin. Male antenna 1.2–1.3 mm long, reaching to about middle of prescutum if bent backwards. Scapal segment elongate, pedicel subglobular, both basal segments brown, flagellum yellow. Flagellomeres oval, two basal flagellomeres slightly dilated ventrally. Apical segment elongate, oval, 0.8 times as long as preceding. Longest verticils 1.4 times as long as respective segment. Rostrum brown, darker dorsally, paler ventrally. Palpus dark brown. **Thorax.** Pronotum obscure yellow, darker frontally, paler posteriorly. Prescutum and presutural scutum



brownish yellow with four distinct dark brown longitudinal stripes. Medial stripes reaching frontal margin of sclerite anteriorly and suture posteriorly, both stripes separated by narrow yellowish line. Lateral stripe starts beyond pseudosutural fovea and reaches medial stripe anteriorly, gets wider and reaches suture posteriorly. Scutal lobe dark brown with narrowly yellow anterior and posterior margins. Area between lobes obscure yellow, sometimes with indistinct darker dot at middle. Scutellum obscure yellow with indistinctly darker posterior margin. Mediotergite grayish-brownish yellow, darker along posterior and lateral margins. Pseudosutural fovea distinct but narrow, blackish, surrounded by obscure yellow area. Pleuron grayish-yellowish brown, paler above frontal and posterior coxae, katepisternum darkened along ventral margin. Dorsopleural membrane pale. Wing grayish, subhyaline, yellowish at base, pattern consists of seven dark brown spots along frontal margin. Spots distinctly narrower than interspaces. Brownish gray areas surround all crossveins, less distinct darkening along entire vein *R*₅, grayish spot at middle of *R*₅, grayish areas at vein tips

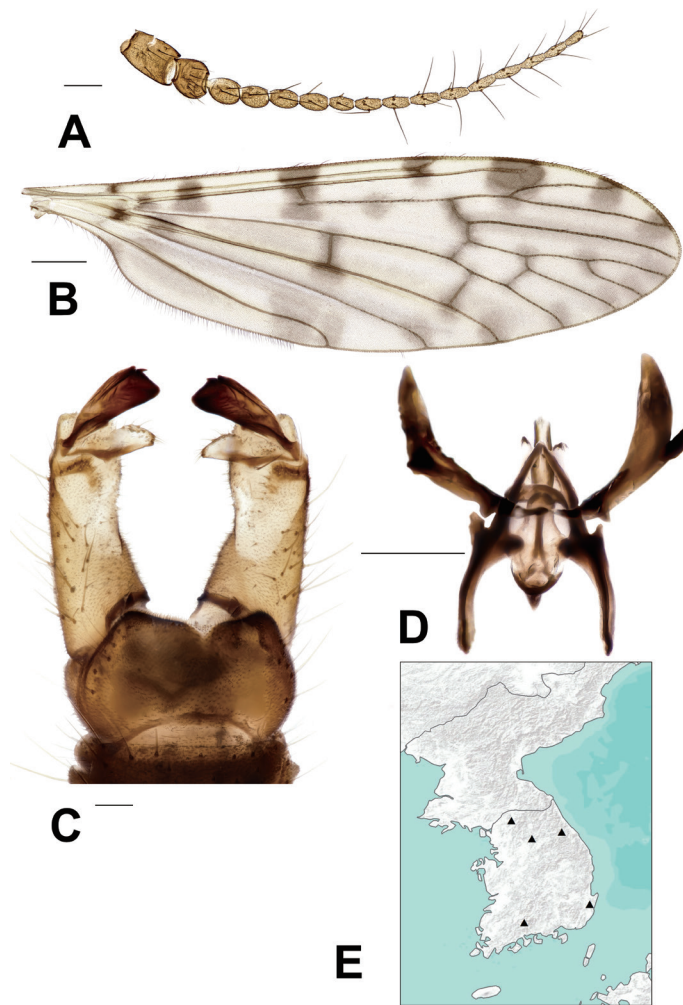


Fig. 94. *Eloeophila koreana* sp. nov., male. **A.** Antenna; **B.** Wing; **C.** male genitalia, dorsal view; **D.** Aedeagal complex, dorsal view; **E.** Collecting localities of *E. koreana* sp. nov. Scale bars: A, C, D = 0.1 mm; B = 0.5 mm.



along wing margin. Wing cells without separate spots or dots. Stigma oval with darker margin and paler central part. Veins grayish brown, pale yellowish at wing base and in costal area, darker in darkened areas. Venation typical for the genus, radial sector angulate and short-spurred at base, *m-cu* at slightly before middle of discal cell. Cell *m*₁ long, 1.4 times as long as its stem. Anal vein slightly sinuous, arched before wing margin. It reaches wing margin at the level of supernumerary cross-vein in cell *bm*, base of radial sector distinctly before supernumerary cross-vein. Distal wing cells without macrotrichiae. Male wing not widened posteriorly, widest in the middle between tips of anal and *CuP* veins. Halter entirely pale. Male halter 0.7–0.9 mm long, female 0.9 mm. Coxae pale, trochanters pale yellow with blackened ventral margin. Femur obscure yellow with widely but indistinctly darkened distal part, tibia yellow, two basal tarsomeres yellow with narrowly and indistinctly darkened tips, remainder of tarsus brown. Male femur II: 4.4 mm long, III: 5.0 mm, tibia II: 3.9 mm, III: 4.2 mm. Female femur II: 5.1 mm long, tibia II: 4.5 mm. **Abdomen.** Brownish-grayish yellow with darkened pregenital segment. Lateral and posterior margins of tergites narrowly darker brown. Sternites pale yellow with wide dark brown posterior part that covers from one-third to nearly half of segment. Male genitalia yellowish brown with contrastingly brownish yellow gonocoxite and blackish outer gonostylus. Epandrium with wide but shallow concavity at posterior margin and blunt, round-apexed lobes on both sides, margin covered with short dense setulae. Gonocoxite strongly elongate, 2.3 times as long as widest part at base, moderately arched, basal part slightly enlarged, without small teeth or spines that often present in other species, apical part slightly extended, rectangular. Outer gonostylus dark brown to blackish, paler at base, widening distally, terminating in a small spine, without marginal serration. Crest on outer margin low, terminating in a small tooth at base of apical spine. Distal part of inner margin strongly expanded with rounded apical part. Inner gonostylus pale, fleshy and setose with darker brown and slightly angulate inner margin, widest at middle, blunt-apexed, apex bearing few setae. Paramere long, slightly arched, blade-shaped, narrows towards apex. Lateral lobe blackish, short, turned upwards, sometimes hardly visible in dorsal view. Aedeagus wide and straight but short in dorsal view, reaching to about two thirds of mesal process of paramere. Lateral projection of lower shelf extended posteriorly, darkened at apex, mesal part of lower shelf without extension along aedeagus. Lateral apodeme elongate, slightly arched, sinuous, basal part widened, distal narrow, nearly parallel-sided. Sperm pump (vesica) oval. Apodeme of vesica directed anteriorly, elongate, peg-shaped, dark brown.

ELEVATION. From 150 m to 650 m.

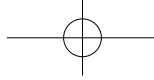
FLIGHT PERIOD. From late May through to early July.

HABITAT. Adults are flying along margins of small mountainous streams and springs on slopes densely covered with mixed forests, shrubs and grassy vegetation, males are attracted to light.

GENERAL DISTRIBUTION. Mountainous areas of Northern, Eastern and Southern parts of South Korea. Probably endemic to Korean Peninsula.

EXAMINED MATERIAL. Holotype, male (in ethanol), South Korea, Gyeonggi-do, Yangpyeong, Cheongun-myeon, Dowon-ri, N37.54507, E127.79483, alt. 224 m, 2017.05.28, coll. S. Podenas, at light (NIBR); Paratypes: two males (in ethanol), S. Korea, Gangwon-do, Pyeonchangan-gun, Jinbu-myeon, Dongsan-ri, Odaesan NP, N37.72425, E128.59814, alt. 648 m, 2015.07.06 (2), S. Kim, S. Podenas (NIBR); one male (in ethanol), S. Korea, Gyeongsangbuk-do, Gyeongju, Yangbuk-myeon, Janghang-ri, N35.76236, E129.36407, alt. 333 m, 2016.05.28(1), H. Baek, S. Podenas (NIBR); one males, one female (in ethanol), S. Korea, Gyeonggi-do, Yangpyeong, Cheongun-myeon,

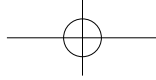




Dowon-ri, N37.54507, E127.79483, alt. 224 m, 2017.05.28, coll. S. Podenas, at light (NIBR); one male (in ethanol), S. Korea, Gyeonggi-do, Pocheon-si, Yeongjung-myeon, Yeongpyeong-ri, MPRC, N38.03644, E127.23226, alt. 150 m, 2019.06.11, T. A. Klein, H.-C. Kim, NJ trap (NIBR); one male (in ethanol), S. Korea, Jeollanam-do, Gurye-gun, Toji-myeon, Naeseo-ri, Piagol valley, N35.26586, E127.58090, alt. 448 m, 2019.06.25 (3), S. Podenas, at light (NIBR).

REMARKS. *E. koreana* **sp. nov.** belongs to *subaprilina* species group that includes also *E. serenensis*. These three species have limited distribution range that covers Korean Peninsula, Japan and Far East of Russia. They have similar general appearance, similar wing pattern and venation. The best diagnostic features for them are in male genitalia, in shape of outer gonostylus and aedeagal complex. On the other hand, *E. subaprilina* could be easily separated from *E. serenensis* and *E. koreana* **sp. nov.** even in the field conditions because of intensely dark knob of halter. Knob of *E. serenensis* and *E. koreana* **sp. nov.** yellow or pale yellow. These two species have distinct differences in shape of outer gonostylus, inner margin of which strongly extended apically beyond apical spine in *E. koreana* **sp. nov.**, rounded and reaching just base of apical spine in *E. serenensis*. Distinct features between these species are seen also in the structure of aedeagal complex, especially paramere which is the widest in *E. koreana* **sp. nov.** Additional character for discrimination of these species are short basal flagellomeres of *E. koreana* **sp. nov.** antenna, these being comparatively longer in *E. subaprilina* and especially *E. serenensis*. Comparison of mitochondrial COI gene sequences of different *Eloeophila* species (Pl. 1) also revealed complex of *E. subaprilina* + *E. serenensis* + *E. koreana* **sp. nov.** and *E. koreana* **sp. nov.** being closer to *E. serenensis* than to *E. subaprilina*. Further phylogenetic analysis was not possible because of lack of comparatively fresh and suitably for DNA sequencing preserved material, most of our attempts to get DNA from old museum specimens were not successful, on the other hand, sequences found in databases show identification mistakes, often different species identified as *E. maculata*, even species from areas far from *E. maculata* distribution range.

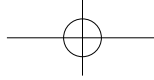




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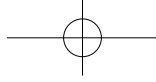
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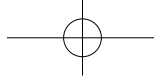
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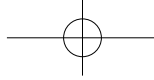
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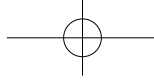
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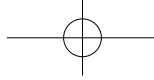


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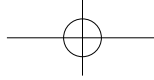


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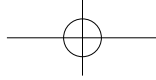
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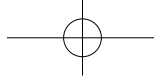
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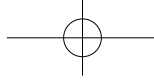


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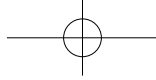
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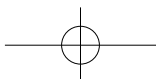
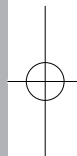
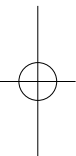
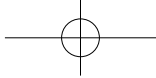
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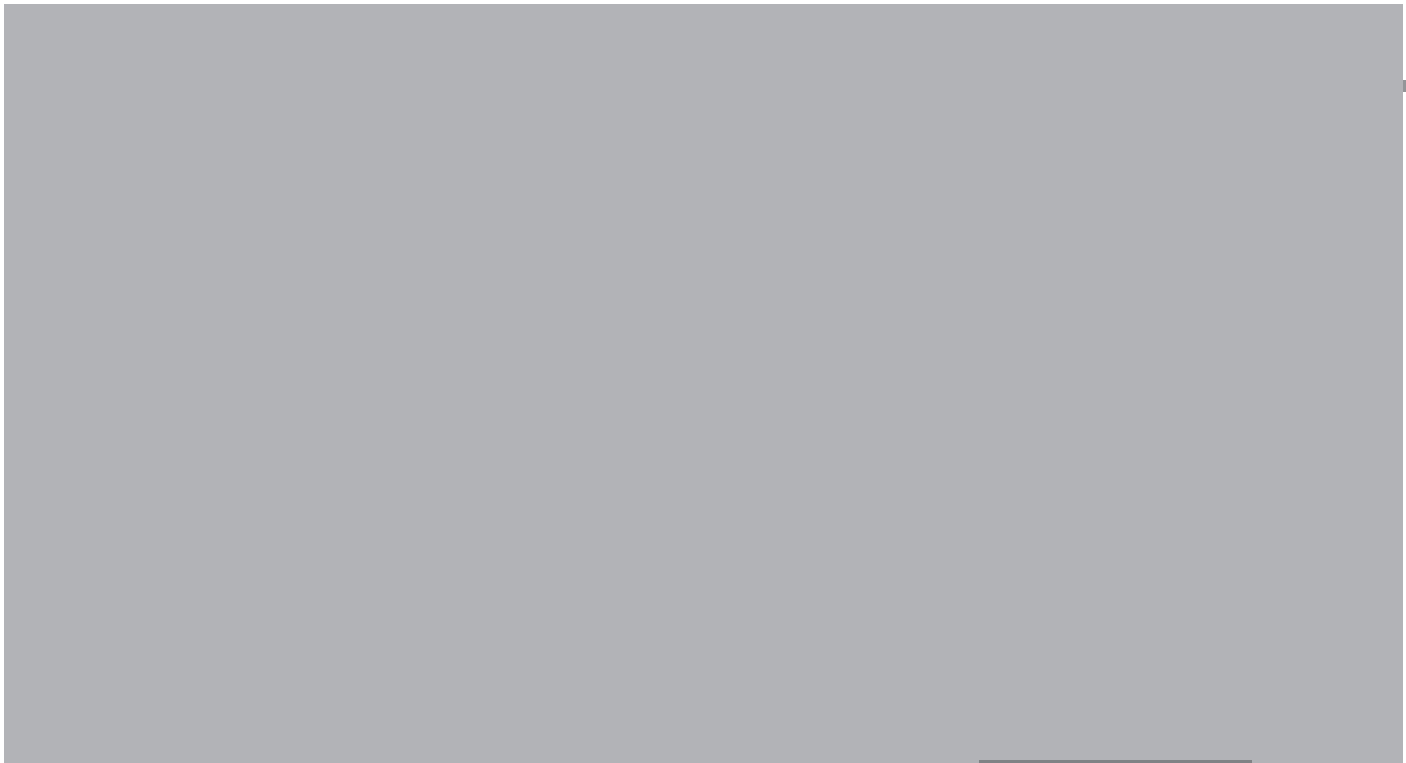
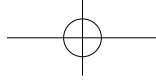




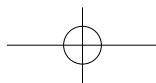
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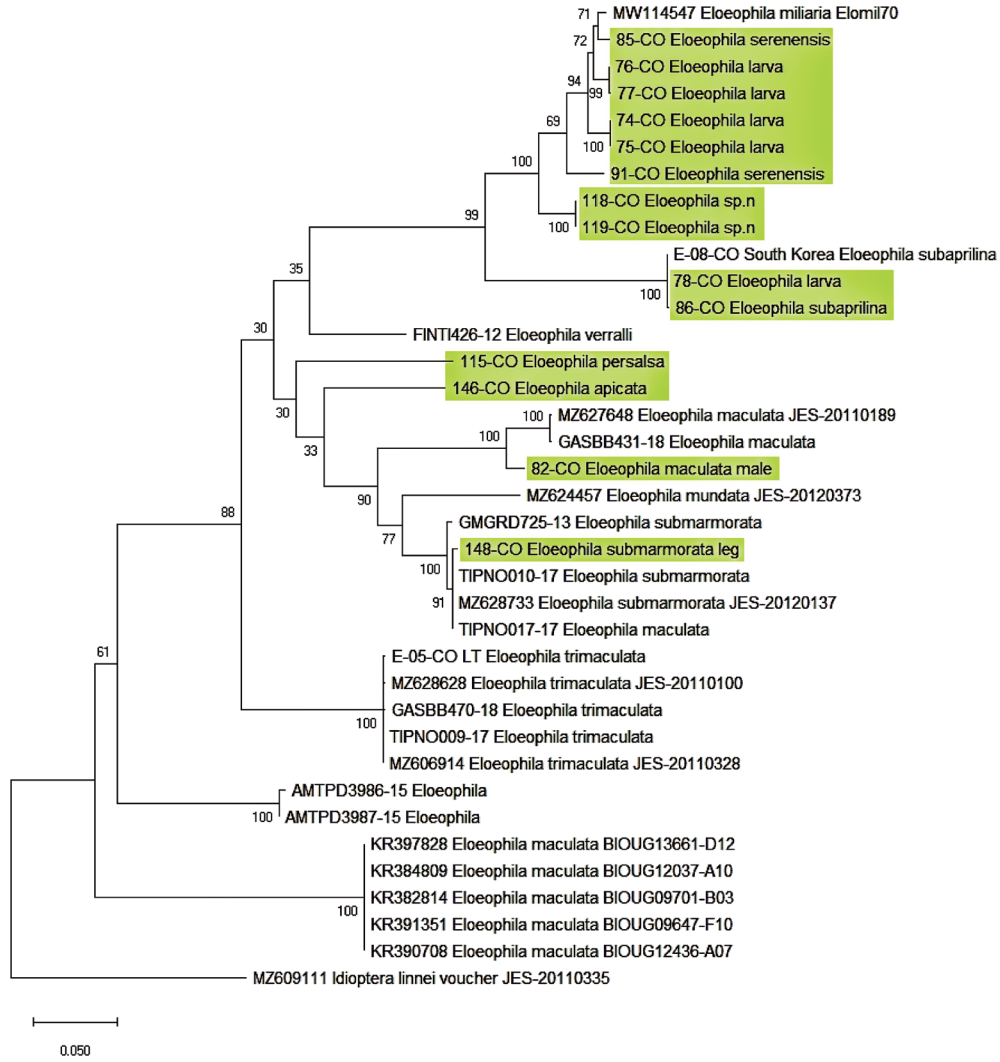






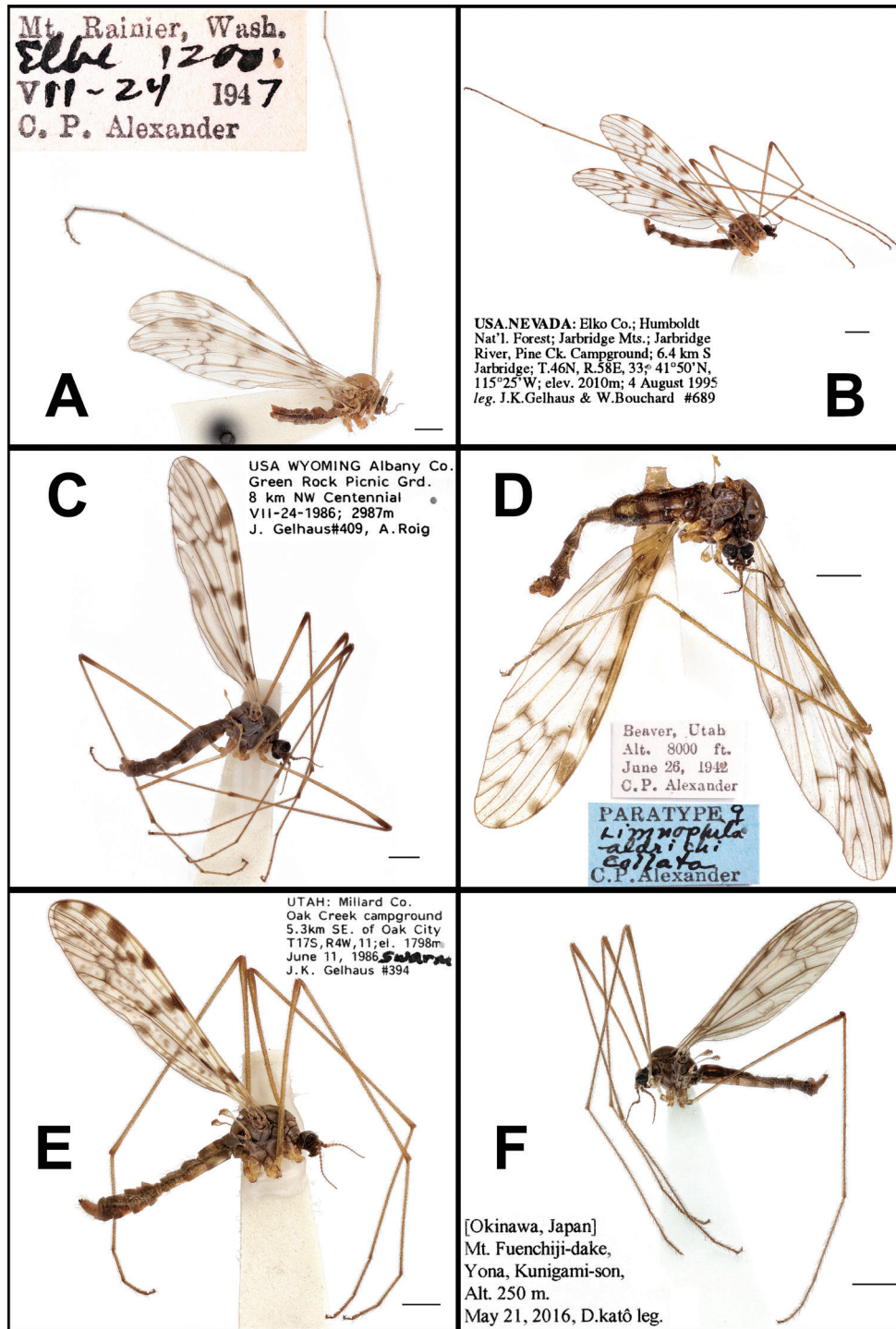
PLATES





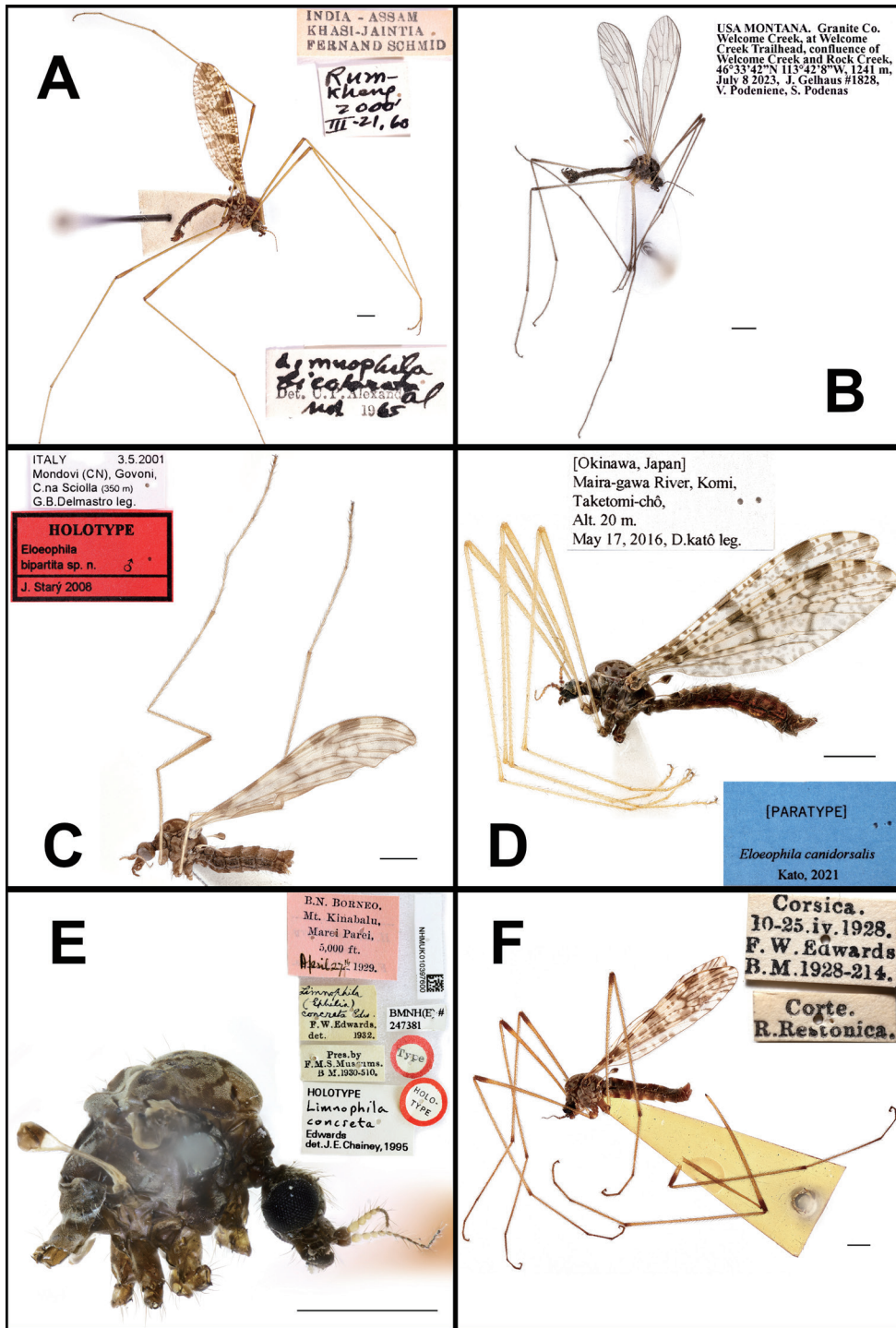
PI. 1. Maximum likelihood phylogenetic tree constructed using mitochondrial COI gene sequences (714 bp) of *Eloephila* species with *Idioptera linnei* as the outgroup. Bootstrap values (1000 replicates) are indicated in the tree. The tree is drawn to scale, with branch lengths measured in the number of substitutions per site. Species names, DNA sample IDs and GenBank accession numbers are given. Species marked by green were identified by the author.





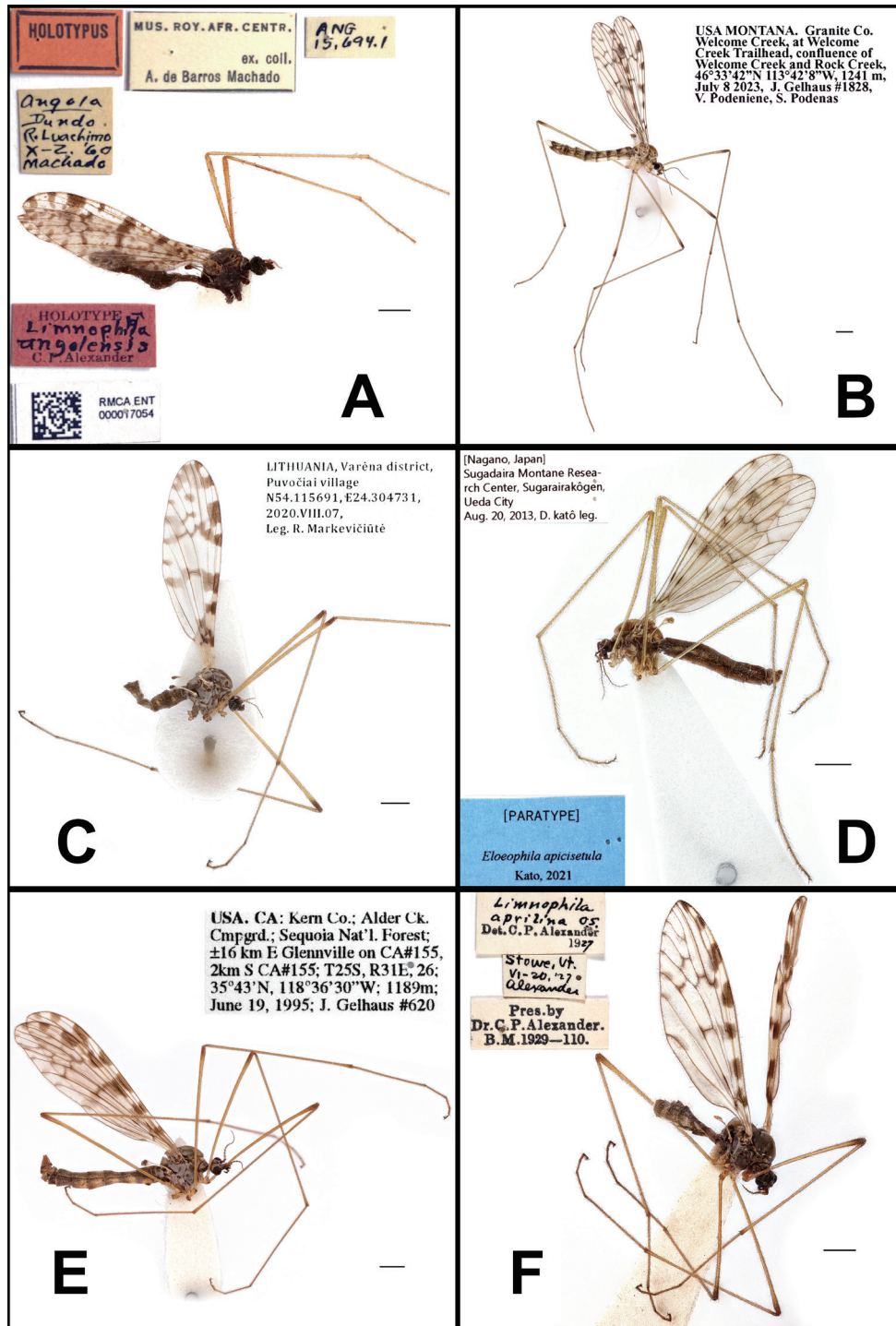
PL. 2. General view of *Eloeophila*. **A.** *E. abrupta* (Alexander, 1949), male; **B.** *E. aldrichi aldrichi* (Alexander, 1927), male; **C.** *E. aldrichi alticrista* (Alexander, 1943), male; **D.** *E. aldrichi collata* (Alexander, 1948), male (mis-labeled as female), paratype; **E.** *E. aleator* (Alexander, 1945), male; **F.** *E. amamiana* (Alexander, 1956), male. Scale bars: 1.0 mm.





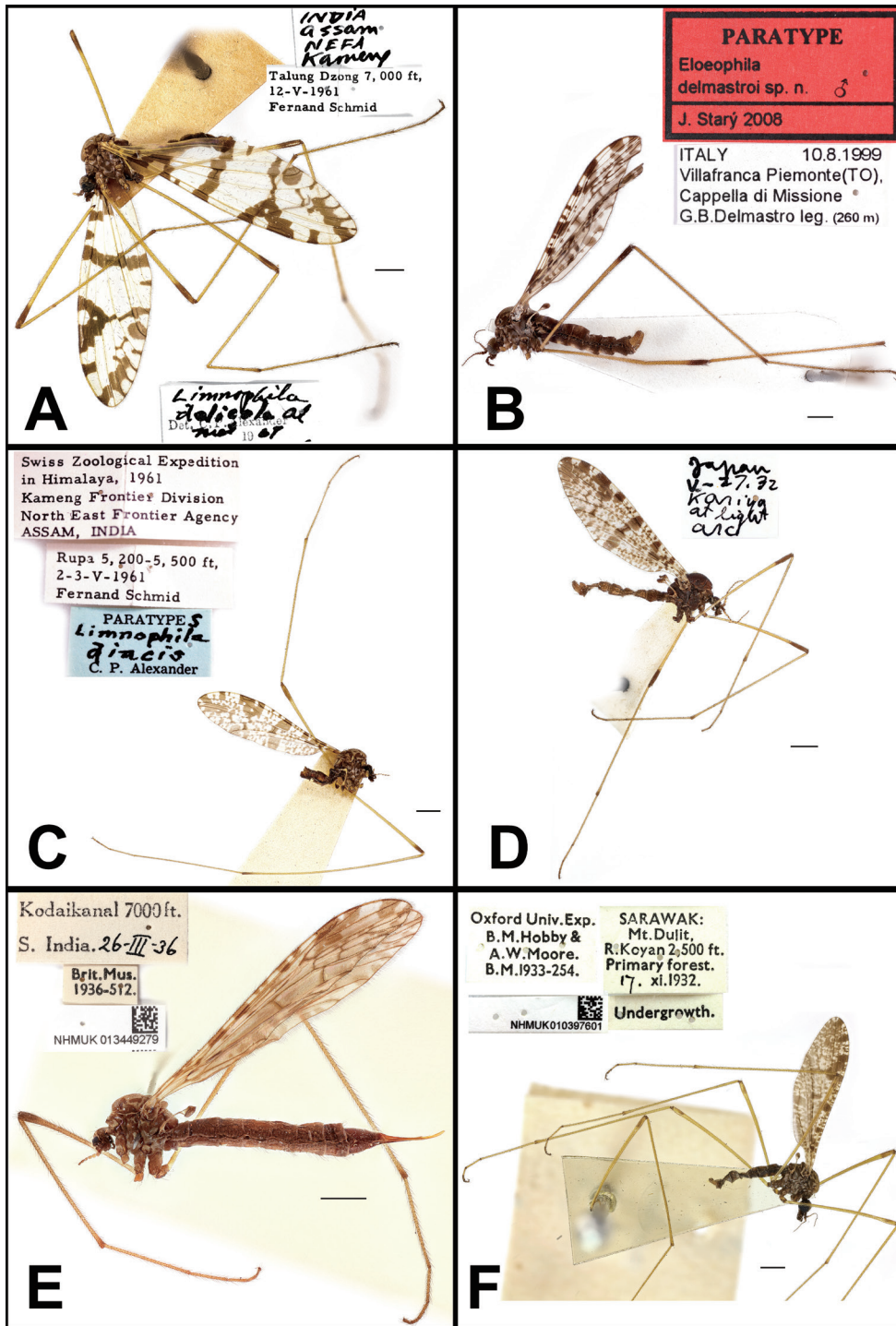
Pl. 3. General view of *Eloeophila*. **A.** *E. angolensis* (Alexander, 1963), male, holotype; **B.** *E. angustior* (Alexander, 1919), male; **C.** *E. apicata* (Loew, 1871), male; **D.** *E. apicisetula* Kato, 2021, male, paratype; **E.** *E. apiculata* (Alexander, 1919), male; **F.** *E. aprilina* (Osten Sacken, 1860), male. Scale bars: 1.0 mm.





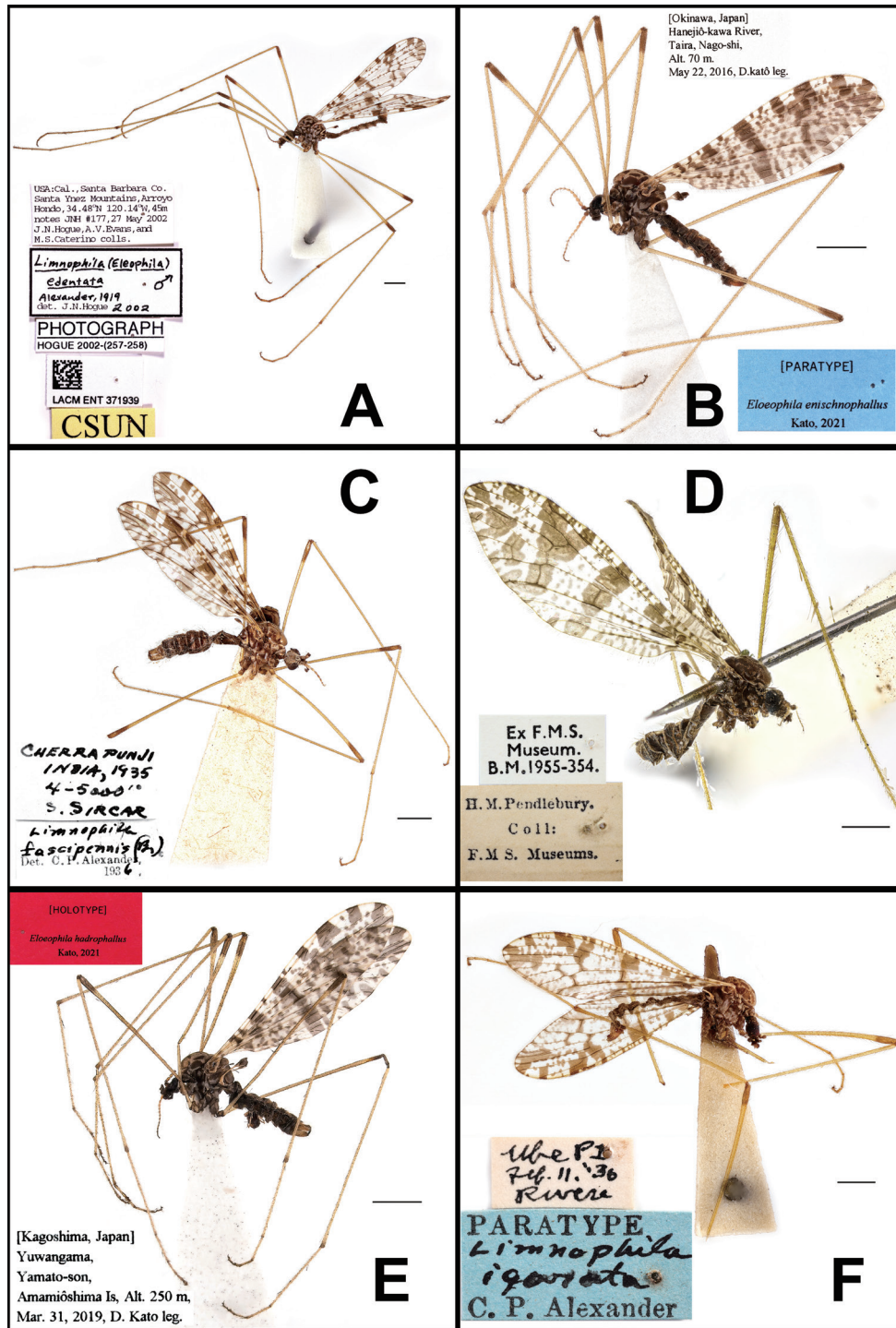
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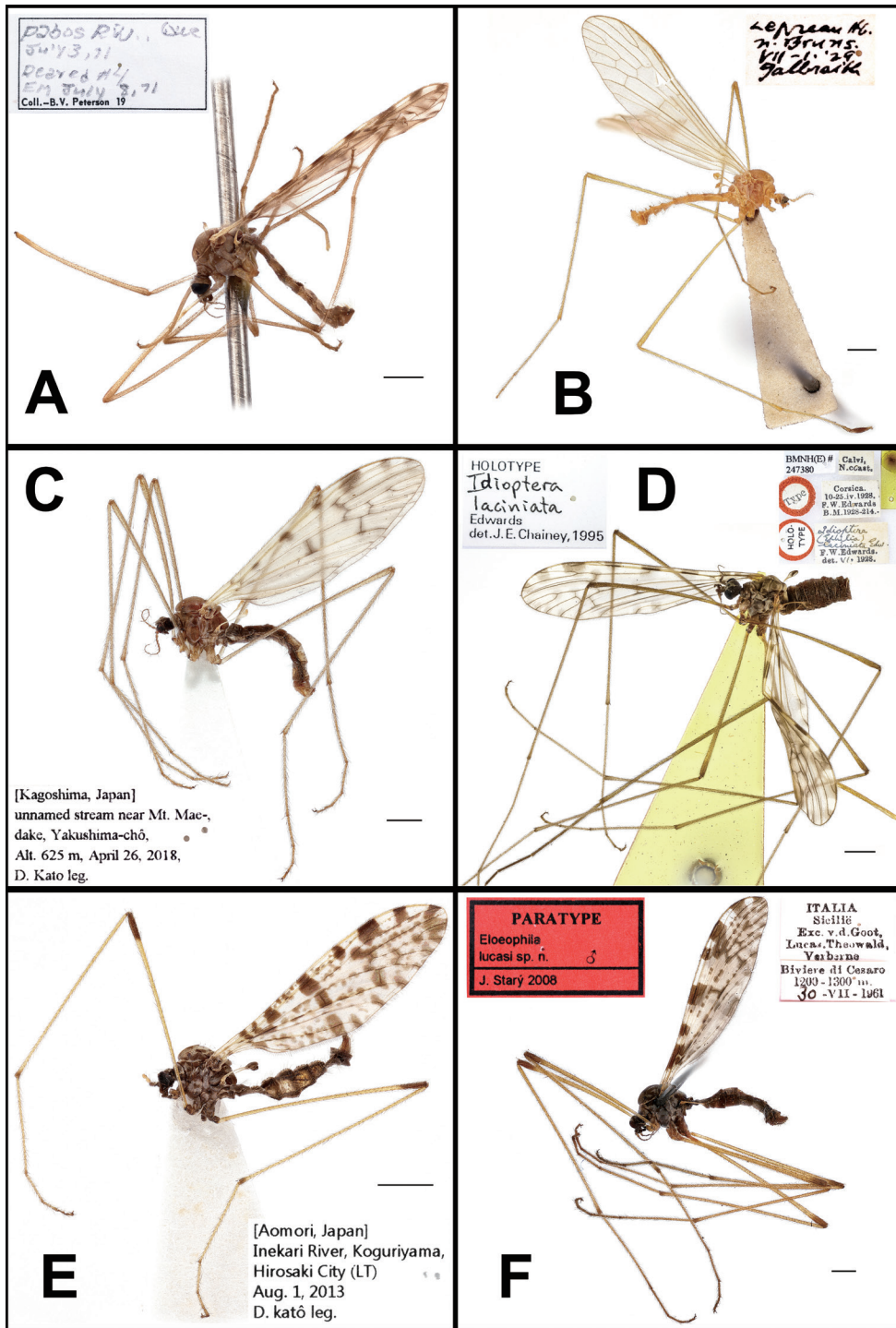
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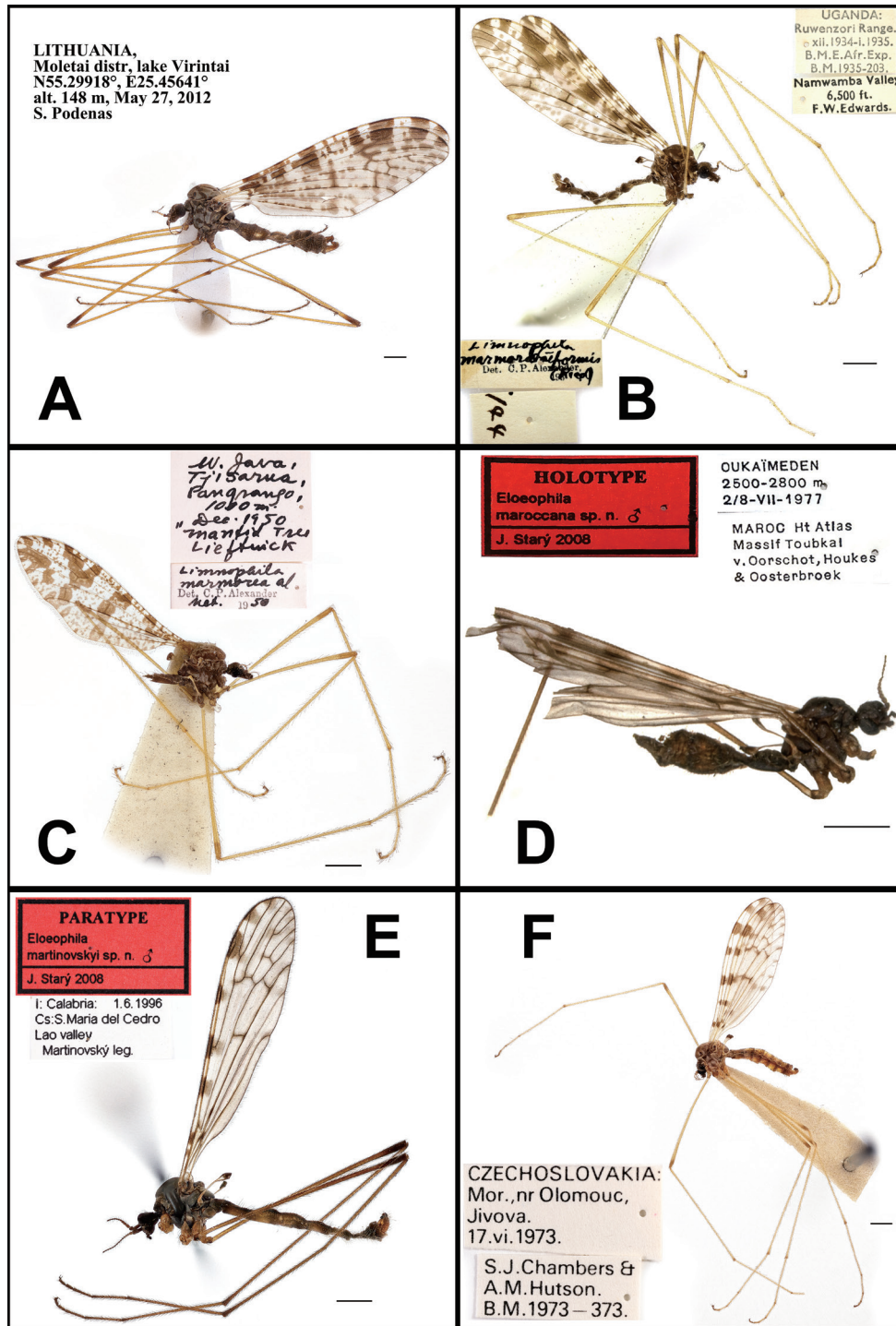
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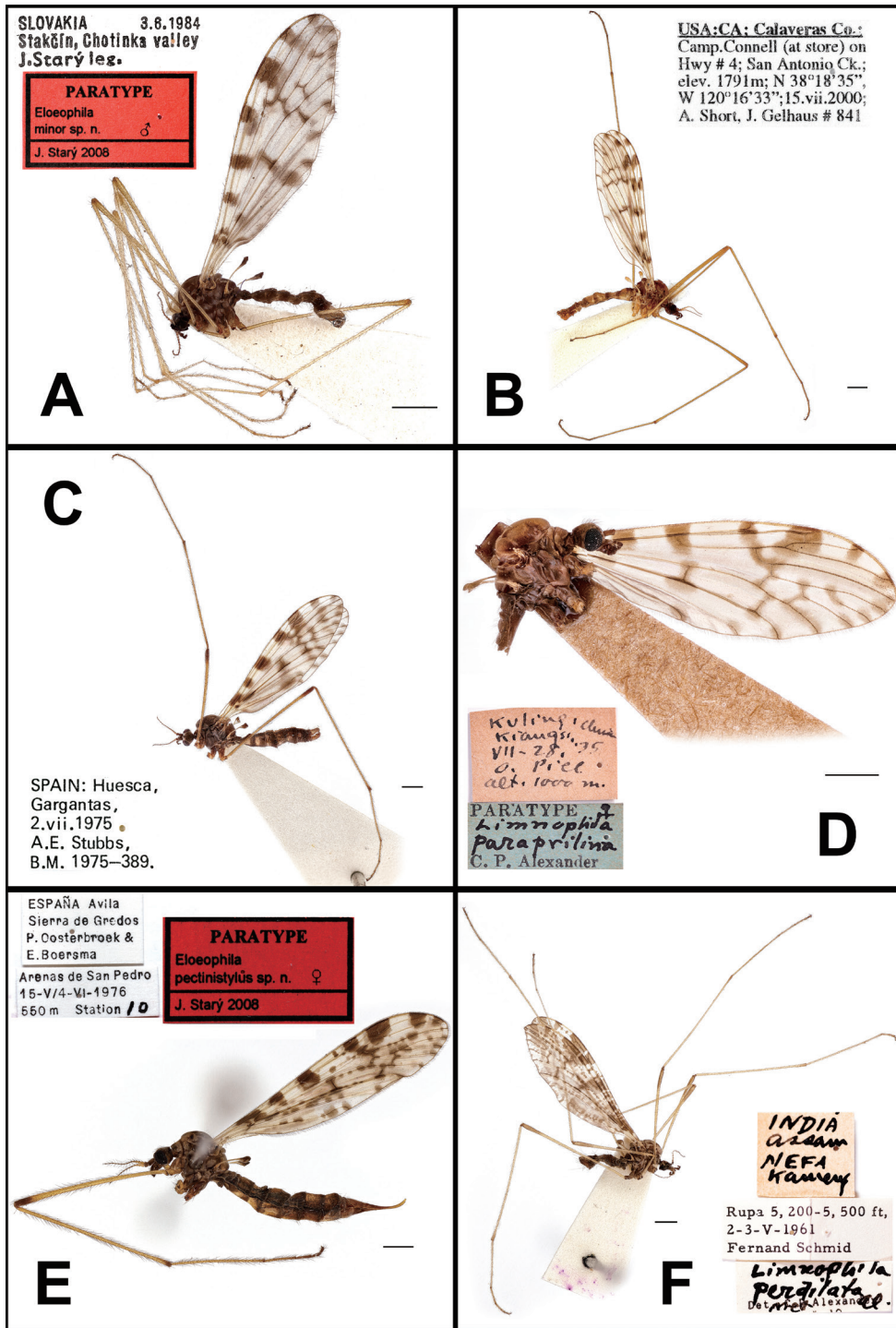
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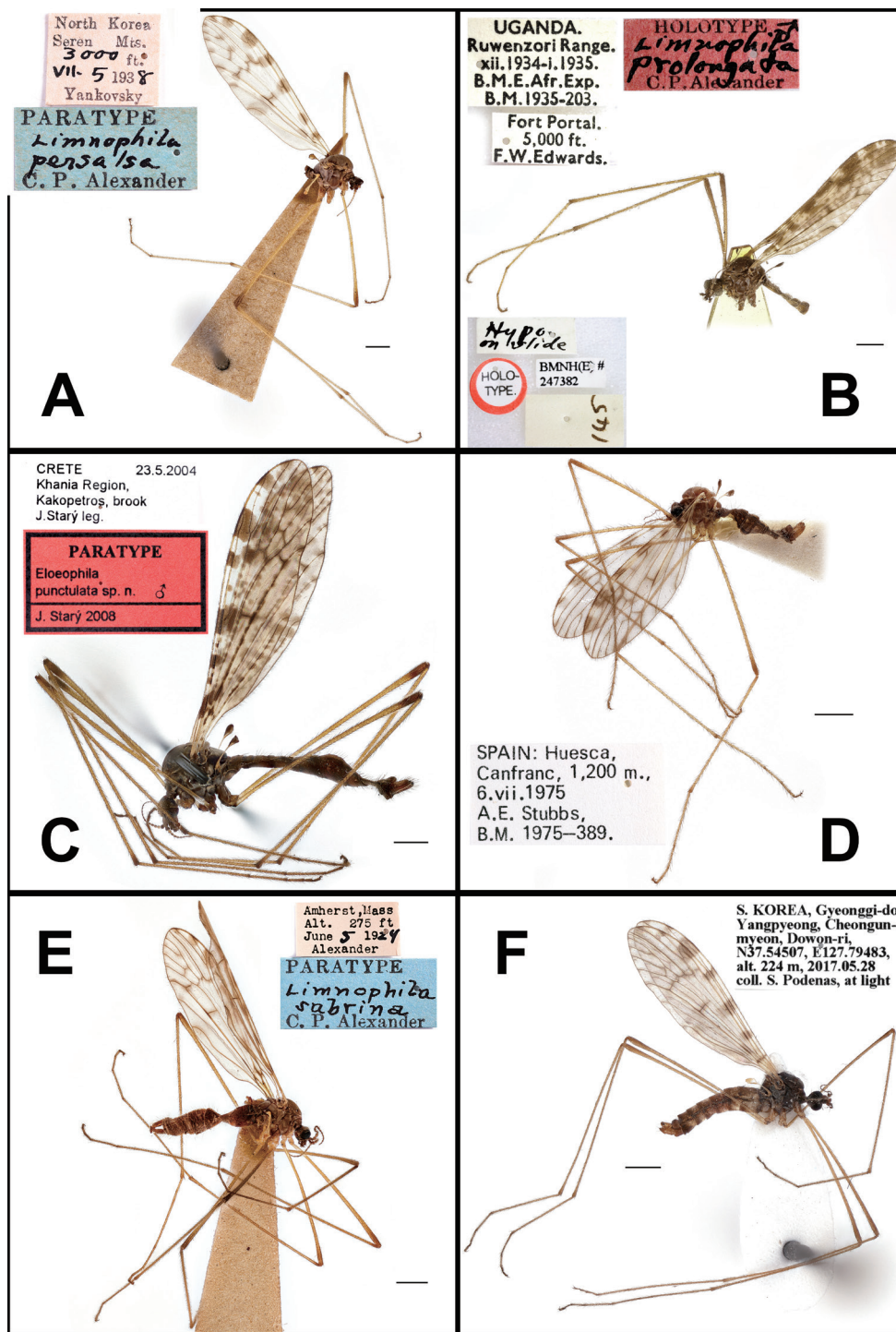
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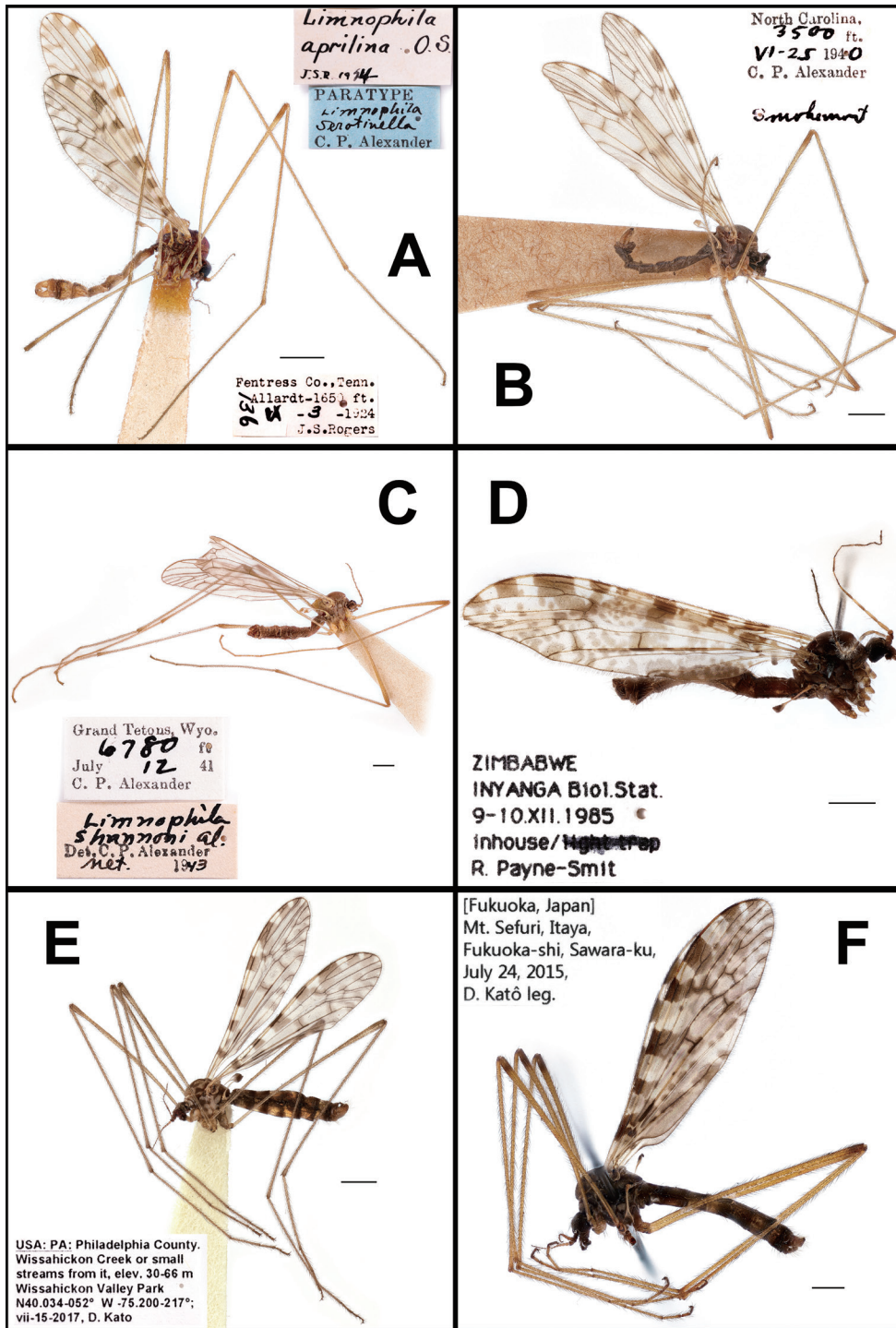
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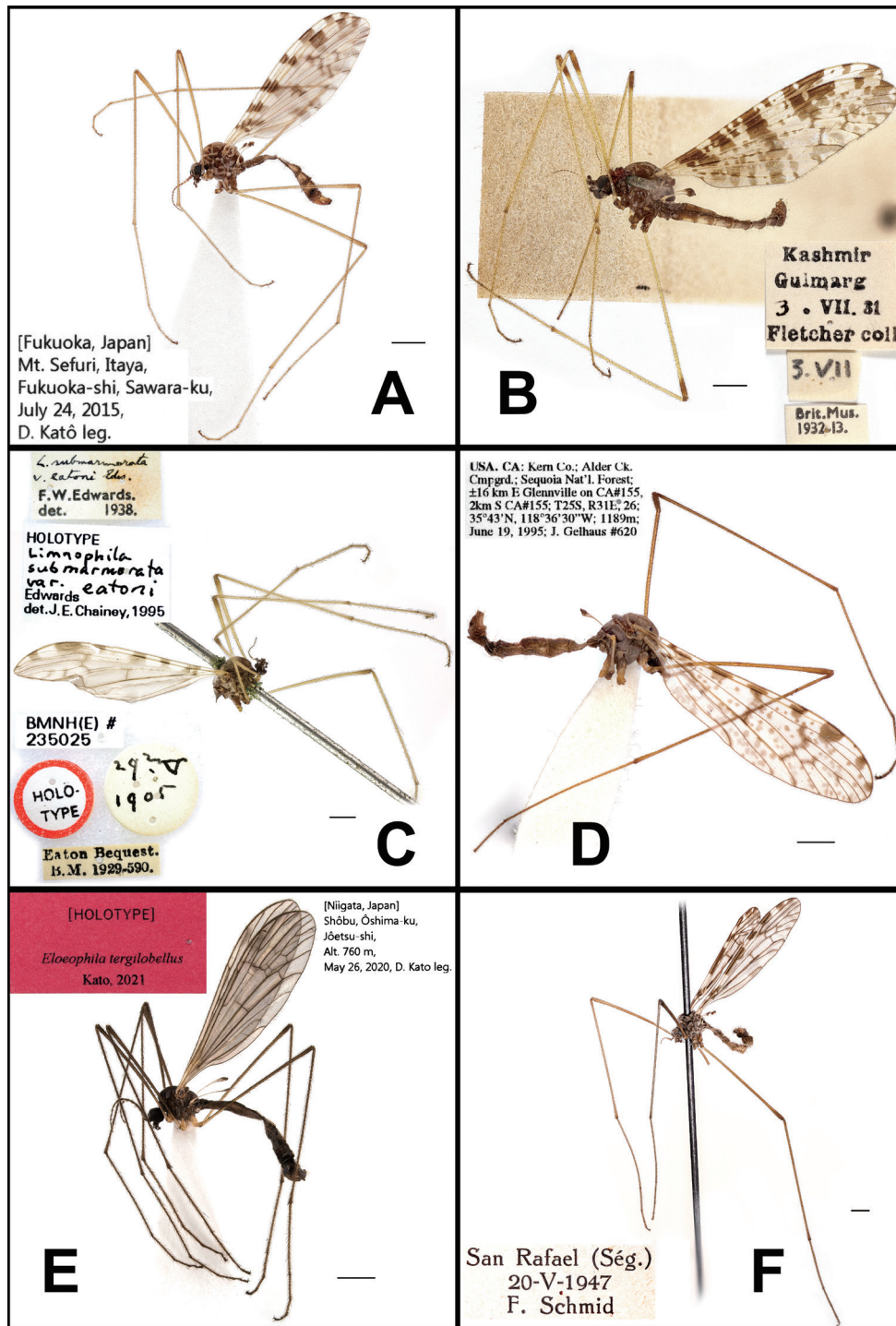
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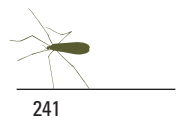


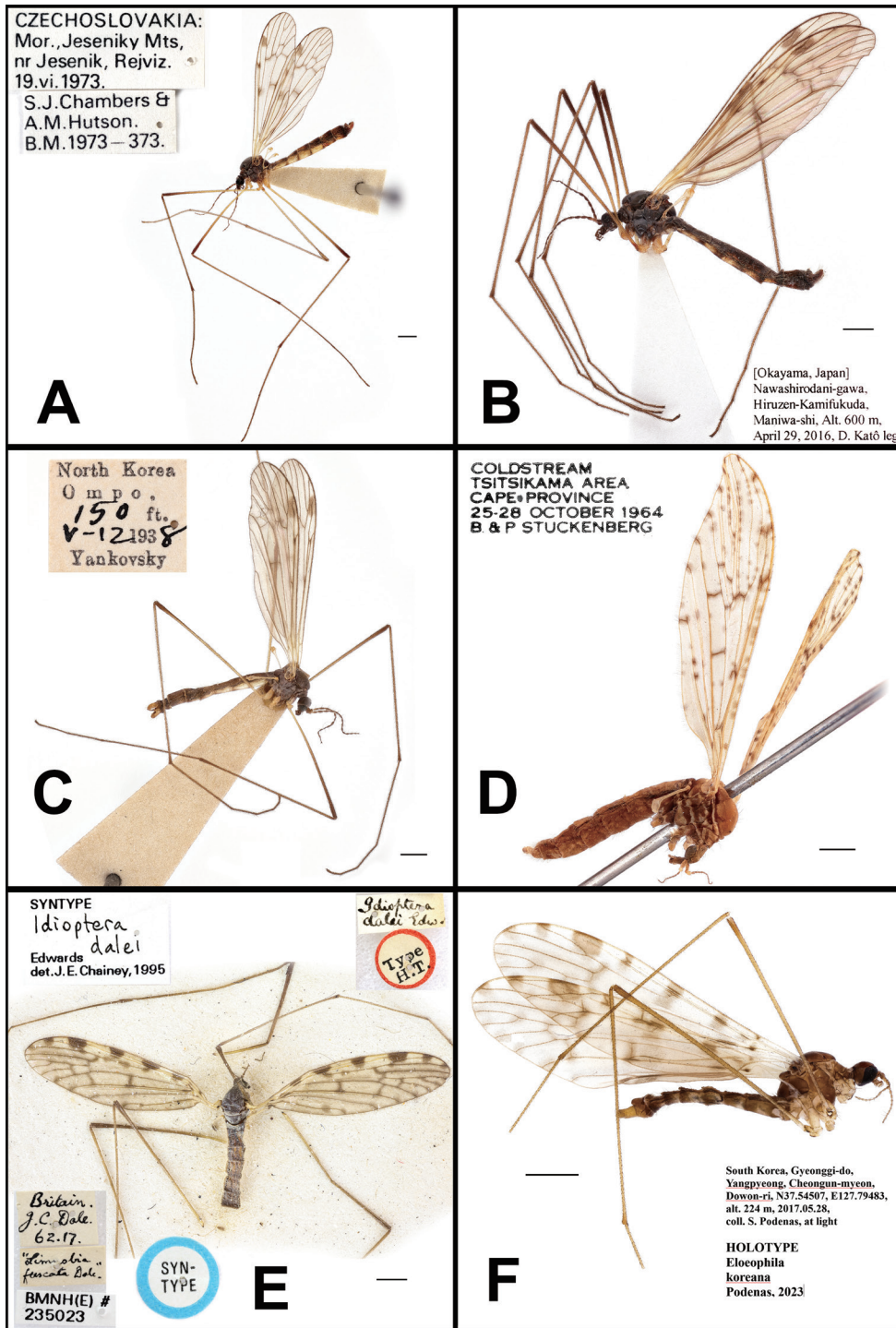
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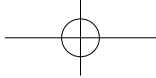
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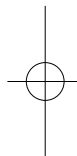
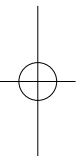


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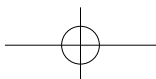


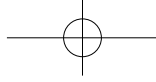


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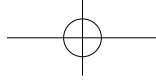




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