

Revision of the West Palaearctic *Euura bergmanni* and *oligospila* groups (Hymenoptera, Tenthredinidae)

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Abstract

Eight Western Palaearctic *Euura* species are here assigned to the *bergmanni* group (*bergmanni*, *brevivalvis*, *dispar*, *glutinosae*, *leptocephalus*, *respondens*, *sylvestris*, and *viridis*) and two species to the *oligospila* group (*frenalis* and *oligospila*). *Euura pallens* (Konow, 1903) (*bergmanni* group) is removed from the list of West Palaearctic taxa. *Euura pyramidalis* (Hellén, 1948) is treated as *incertae sedis* within the *bergmanni* group. Definitions of the *bergmanni* and *oligospila* groups are primarily based on genetic sequence data (mitochondrial COI and nuclear NaK and POL2). We report likely occurrence of heteroplasmy and amplification of NUMTs among some of the treated species, complicating the use of DNA barcoding in species discrimination. Based on morphological and genetic evidence, we establish that the correct name for the invasive willow sawfly in the southern hemisphere (South America, southern Africa, Australia, New Zealand), known there only in the female sex, is *Euura respondens* (Fürster, 1854). The species is probably native to the Palaearctic (or even Holarctic) where males are common: possibly as common as females (examined from Europe and Central Asia). The name *Euura oligospila* (Fürster, 1854) has been incorrectly used for the species in the southern hemisphere. The examination of type material and reliable association of males and females based on genetics revealed that females of *E. oligospila* are morphologically extremely similar to *E. respondens* (and to some other *E. bergmanni* group

species), but male penis valves and genetics enable reliable separation of these species. Morphological separation of females of *E. oligospila* and *E. respondens* is possible, but challenging. Identification keys for males and females of the *bergmanni* and *oligospila* groups are provided. The following 15 new synonymies are proposed: *Nematus validicornis* Förster, 1854, **syn. nov.** with *Euura bergmanni* (Dahlbom, 1835); *Pteronidea woollatti* Lindqvist, 1971, **syn. nov.** and *Nematus turgaiensis* Safjanov, 1977, **syn. nov.** with *Euura brevivalvis* (Thomson, 1871); *Pteronidea pseudodispar* Lindqvist, 1969, **syn. nov.** with *Euura dispar* (Zaddach, 1876); *Nematus (Pteronidea) fastosus* var. *ponojense* Hellén, 1948, **syn. nov.** and *N. (P.) fastosus* var. *punctiscuta* Hellén, 1948, **syn. nov.** with *Euura frenalis* (Thomson, 1888); *Nematus declaratus* Muche, 1974, **syn. nov.** and *N. desantisi* D.R. Smith, 1983, **syn. nov.** with *Euura respondens* (Förster, 1854); *Pteronidea straminea* Lindqvist, 1958, **syn. nov.**, *P. angustiserra* Lindqvist, 1969, **syn. nov.**, and *P. disparoides* Lindqvist, 1969, **syn. nov.** with *Euura sylvestris* (Cameron, 1884); *Pteronidea breviseta* Lindqvist, 1946, **syn. nov.**, *P. breviseta* Lindqvist, 1949, **syn. nov.**, *P. abscondita* Lindqvist, 1949, **syn. nov.**, and *P. lauroi* Lindqvist, 1960, **syn. nov.** with *Euura viridis* (Stephens, 1835). Lectotypes are designated for 18 nominal taxa: *Amauronematus longicornis* Konow, 1897; *A. spurcus* Konow, 1904; *Nematus bergmanni* Dahlbom, 1835; *N. brevivalvis* Thomson, 1871; *N. curtispina* Thomson, 1871; *N. (Pteronidea) fastosus* var. *ponojense* Hellén, 1948; *N. (P.) fastosus* var. *punctiscuta* Hellén, 1948; *N. glutinosae* Cameron, 1882; *N. microcercus* Thomson, 1871; *N. polystipus* Förster, 1854; *N. prasinus* Hartig, 1837; *N. respondens* Förster, 1854; *N. salicivorus* Cameron, 1882; *N. validicornis* Förster, 1854; *N. virescens* Hartig, 1837; *Pteronidea curtispina* var. *luctuosa* Enslin, 1916; *Pteronus fastosus* Konow, 1904; and *P. pallens* Konow, 1903.

Keywords

DNA barcode sharing, heteroplasmy, invasive species, lectotype, mitonuclear discordance, Nanopore sequencing, NUMTs, sawflies, synonyms

Introduction

The genus *Euura* Newman, 1837, native to the Holarctic and Oriental regions, is the largest in the Nematinae (Tenthredinidae), containing about 650 species, or half of the subfamily (Taeger et al. 2010, 2018). The generic concept was significantly expanded in 2014 as a result of phylogenetic analyses of genetic data (Prous et al. 2014). The genus has remained taxonomically problematic due to the large number of species and high degree of morphological similarity. During 2017–2020 revisionary work on *Euura* was funded by the Swedish Taxonomy Initiative. Some of the results are presented here, focussing on a revision of the *Euura bergmanni* and *oligospila* groups in the West Palaearctic. The definition of these groups is largely based on an analysis of genetic sequence data. The decision to publish on these two groups before the main revision of *Euura*, is mainly due to the need to correct the taxonomic confusion surrounding the willow sawfly that has become invasive in the southern hemisphere (Caron et al. 2013, 2014; Malagón-Aldana et al. 2017). We provide evidence to distinguish it from closely related or distantly related but morphologically very similar species within the *bergmanni* and *oligospila* groups of *Euura*. Preparation of a revision of other European *Euura* species is in progress.

Materials and methods

Specimens examined or mentioned are deposited in the following collections:

BIOUG	Centre for Biodiversity Genomics, University of Guelph, Canada;
BMNH	The Natural History Museum, London, United Kingdom;
CMH	Collection of Mikk Heidemaa, Tartu, Estonia;
CVV	Collection of Veli Vikberg, Turenki, Finland;
GNM	Naturhistoriska Museet, Göteborg, Sweden;
MNHN	Muséum National d'Histoire Naturelle, Paris, France;
MZH	Finnish Museum of Natural History, Helsinki, Finland;
MZLU	Lunds Universitet, Lund, Sweden;
NHRS	Naturhistoriska Riksmuseet, Stockholm, Sweden;
NIBIO	Norwegian Institute of Bioeconomy Research, Svanhovd, Norway;
SDEI	Senckenberg Deutsches Entomologisches Institut, Münchenberg, Germany;
SMTP	Swedish Malaise Trap Project, Station Linné, Öland, Sweden;
TUZ	Natural History Museum, University of Tartu, Tartu, Estonia;
USNM	National Museum of Natural History, Smithsonian Institution, Washington, USA;
UUZM	Uppsala University, Uppsala, Sweden;
ZIN	Russian Academy of Sciences, Zoological Institute, St. Petersburg, Russia;
ZMHB	Museum für Naturkunde der Humboldt-Universität, Berlin, Germany;
ZMUO	Zoological Museum, University of Oulu, Finland;
ZMUT	Zoological Museum, University of Turku, Finland;
ZSM	Zoologische Staatssammlung, München [= Munich], Germany.

Other abbreviations:

BIN	barcode index number;	LT	lectotype;
HT	holotype;	ST	syntype or syntypes.

Specimens studied are listed in the Suppl. material 1 and in the Appendix 1. Additional specimens mentioned, but not examined morphologically, can be found in BOLD (<http://www.boldsystems.org/>).

Morphological methods

To photograph penis valves and lancets (valvula 1 or ventral part of the saw), genital capsules and ovipositors were separated from the specimen and macerated in KOH (10–15%) for 6–10 hours at room temperature, or treated with proteinase during DNA extraction. Temporary slide preparations of dissected lancets and penis valves in glycerine were made, and after photography, the parts were glued on a piece of cardboard, which was pinned with the corresponding specimen. In addition, relevant permanent

slide preparations borrowed from institutional or personal (Veli Vikberg, Turenki) collections were photographed. Photos were taken with a digital camera attached to a microscope. Composite images with an extended depth of field were created from stacks of images using the software CombineZP (Alan Hadley; <http://www.hadleyweb.pwp.blueyonder.co.uk/>, although apparently no longer available) or Helicon Focus 7.6.4. Most of the lancets were photographed in two overlapping parts and a single image was created using the program Image Composite Editor (Microsoft) or with the plugin MosaicJ (Thévenaz and Unser 2007) implemented in ImageJ (Wayne Rasband; <http://imagej.nih.gov/ij/>). Morphological terminology follows Viitasaari (2002).

Molecular methods

For species delimitation and to associate males and females, mitochondrial and nuclear DNA was sequenced from representatives of *Euura* belonging to the *bergmanni* and *oligospila* groups as well as other selected species. DNA was sequenced using Sanger (Prous et al. 2019) or Oxford Nanopore technologies. For Nanopore sequencing, amplicons belonging to different species or species groups were pooled and sequenced with the MinION R9.4.1 or R10.3 flow cells using a Ligation Sequencing Kit (SQK-LSK109). Most of the amplicons sequenced with MinION were amplified using different combinations of tailed forward and reverse primers (variable 4–12 bp added to the 5'-end) to confirm the identity of the final consensus sequences. The raw sequencing signal from MinION was basecalled (translated into a DNA sequence) with Guppy v4.0.11 or 4.2.3 in high accuracy mode. Using available sequences as query, corresponding single molecule Nanopore reads were identified with BLAST 2.9.0+ (<https://www.ncbi.nlm.nih.gov/books/NBK279690/>). A maximum of 3000 single reads were aligned with MAFFT v7.427 (Katoh and Standley 2013) and the maximum likelihood trees were built with FastTree 2.1.11 (Price et al. 2010). Based on the resulting trees, separate clusters of reads were identified and subsequently used to create consensus sequences. Based on 15–200 reads of each amplicon, MAFFT v7.427 together with EMBOSS cons v6.6.0.0 (<http://emboss.open-bio.org/rel/dev/apps/cons.html>) and abPOA 1.0.4 (<https://github.com/yangao07/abPOA>) were used to create initial consensus sequences that were further polished with Medaka 1.0.1 (<https://github.com/nanoporetech/medaka>). Medaka variant calling was used to separate haplotypes of nuclear genes. A more detailed protocol and data analysis workflow will be published separately. For most specimens, one mitochondrial and two nuclear genes were sequenced. The mitochondrial gene used is a part (1078–1087 bp) of cytochrome c oxidase subunit I (COI). For a small number of specimens, a longer mitochondrial fragment (including partial tRNA-Cys and complete tRNA-Tyr upstream of COI) was amplified with the primers TW-J1301 (Simon et al. 2006) and A2590 (Normark et al. 1999), resulting in COI length of 1119 bp. For other COI and nuclear primers, see Prous et al. (2019). The two nuclear markers are fragments of sodium/potassium-trans- porting ATPase subunit alpha (NaK, 1654 bp) and DNA dependent RNA polymerase II subunit RPB1 (POL2, 2527–2552 bp or 2700–2709 bp). The NaK fragment does

not include any introns, but POL2 has one short intron (58–84 bp) that was excluded from phylogenetic analyses. For some specimens, shorter sequences of each gene (in most cases due to lower quality of DNA) were obtained. After excluding the intron in POL2, alignment of all genes was straightforward because of the lack of insertions or deletions in the studied specimens (length differences were only due to the extent the gene regions were amplified and sequenced). Some of the analysed sequences have been published previously (GenBank accessions in the Suppl. material 1 dataset of the studied specimens). Additionally, some COI sequences were obtained from BOLD (<http://www.boldsystems.org/>). The newly obtained DNA sequences have been submitted to NCBI GenBank (accessions MW939671–MW939746, MW939748–MW939850, MW939852–MW939885, and MZ479384–MZ479675). To concatenate separate gene alignments, we used R (R Core Team 2019) package *ape* (Jombart et al. 2017). Phylogenetic analyses using maximum likelihood (ML) were done with IQ-TREE 1.6.1 or 1.6.12 (<http://www.iqtree.org/>) (Nguyen et al. 2015). By default, IQ-TREE runs ModelFinder (Kalyaanamoorthy et al. 2017) to find the best-fit substitution model and then reconstructs the tree using the model selected according to Bayesian information criterion (BIC). We complemented this default option with a SH-like approximate likelihood ratio (SH-aLRT) test (Guindon et al. 2010) and ultra-fast bootstrap (Hoang et al. 2018) with 1000 replicates to estimate robustness of reconstructed splits. COI (658 bp barcoding region, minimum length 600 bp) and nuclear (combined NaK and POL2, minimum length 1529 bp) p-distances (proportion of nucleotide differences) were calculated in R with the package *ape* (Paradis and Schliep 2018). In addition, we used *ape* to calculate the proportion of ambiguous positions for nuclear genes (i.e. heterozygosities) to get the p-distances between the haplotypes of every female and heterozygous larva. Note that p-distances between haplotypes can be larger than maximum within-species distances calculated from the alignment. The reason is that ambiguous positions are treated as missing data in the *ape* function *dist.dna*. Alignments used for phylogenetic analyses are available as Suppl. material 2.

Results

Definition of *bergmanni* and *oligospila* groups

The *bergmanni* and *oligospila* groups of *Euura* are here primarily defined based on phylogenetic analyses of DNA sequence data (Fig. 1), but are supported by morphological evidence. The names of the groups are based on the oldest valid species name in that group. Living females of both groups are usually mostly green (except *E. leptocephalus*) (Fig. 4), but males vary from nearly completely black (*E. leptocephalus*) to largely pale yellowish (e.g. Figs 17C, D, 19E, F). There are other species within *Euura* that are green in life and could be confused with the *bergmanni* and *oligospila* groups, like *Euura poecilonota* (Zaddach, 1876) and *Euura hypoxantha* (Förster, 1854). *Euura hypoxantha* has a less pointed valvula 3 in lateral view (Fig. 5E) and the radix

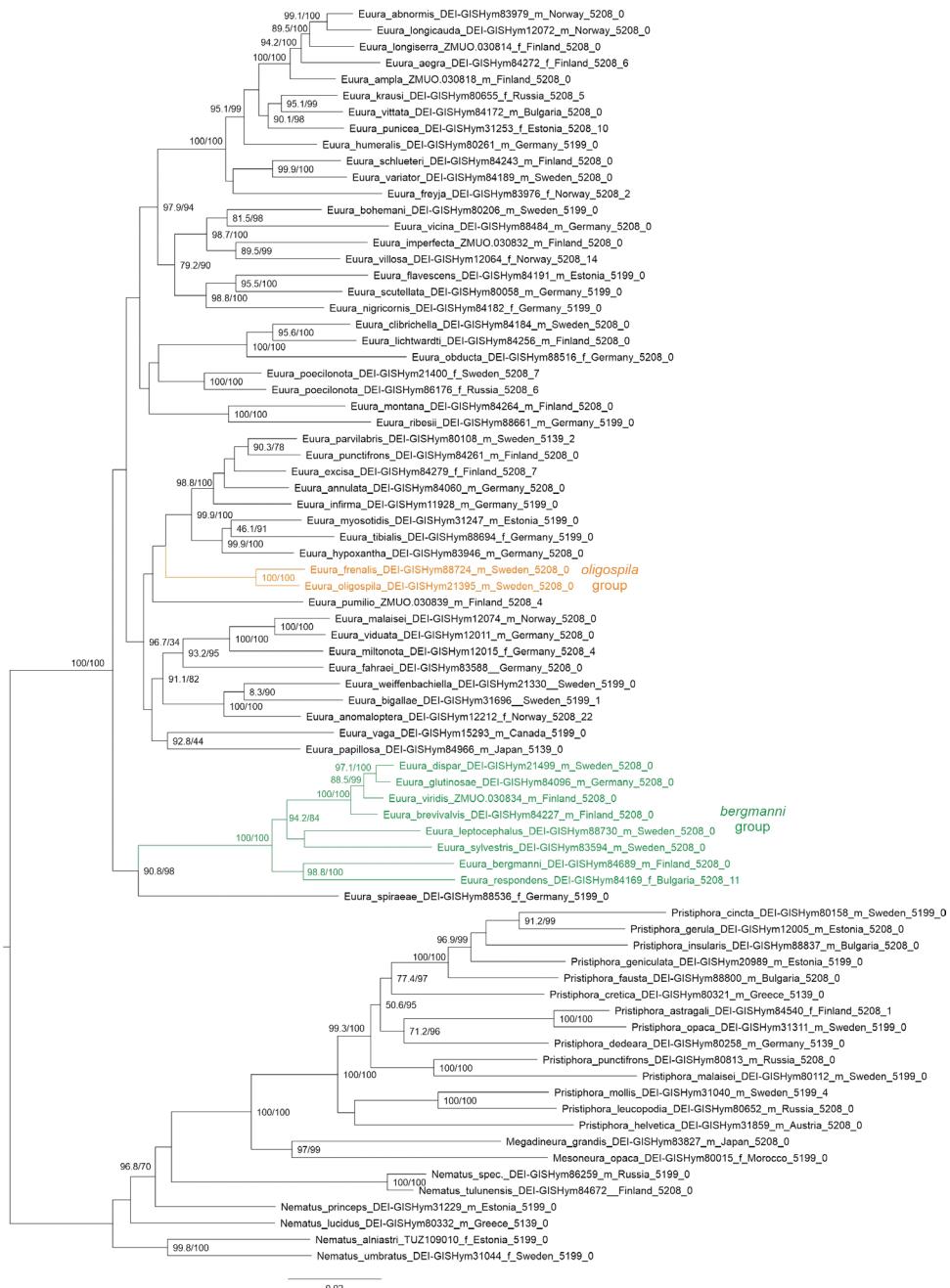


Figure 1. Maximum likelihood tree of *Euura* based on three genes (mitochondrial COI and nuclear NaK and POL2). Numbers at branches show SH-aLRT support (%) / ultrafast bootstrap support (%) values. Support values for weakly supported branches (<90) are not shown. Letters “f” and “m” stand for “female” and “male” if known. Numbers at the end of the tip labels refer to the length of the sequence and the number of ambiguous positions (e.g., heterozygosities). The tree was arbitrarily rooted between *Euura* and other Nematini. The scale bar shows the number of estimated substitutions per nucleotide position.

and lamnium of the saw (Fig. 6D) are of similar length while in the *bergmanni* and *oligospila* groups (Figs 5F–H, 6A, B, 8–9) valvula 3 is more pointed in lateral view and the lamnium is distinctly longer than the radix. *Euura poecilonota* has a different saw (broader, with more serrulae, and different structure of basal serrulae, Fig. 6C). Based on penis valves (Figs 11A–J, 12A, B), males of the *bergmanni* and *oligospila* groups are easier to distinguish from each other and from other species of *Euura* than females. Males of *E. poecilonota* are not known for certain (likely candidate on Fig. 12C), because all previous associations have been almost certainly in error. Penis valves illustrated by Benson (1958) for *E. poecilonota* (under the name *Nematus viridescens*) belong to *E. hypoxantha* (Fig. 12D) and those by Macek et al. (2020) to *E. dispar*. The main difference between *bergmanni* (Fig. 11A–J) and *oligospila* (Fig. 12A, B) group penis valves is in the shape of the valviceps (paravalva + pseudoceps), which is basally about as broad as apically and has a weak or distinct constriction in the middle in *oligospila* group (usually broader apically and without constriction in the middle in *bergmanni* group). *Euura bergmanni* group penis valves usually also have a distinctly deeper invagination between the valvispina and paravalva than in the *oligospila* group. Identification characters of species of the *bergmanni* and *oligospila* groups are summarised in the keys given below. Within the *bergmanni* group it is worth defining the *viridis* subgroup (*brevivalvis*, *dispar*, *viridis*, and *glutinosae*) that is genetically well supported (Fig. 2) and where mitochondrial COI sequences do not allow reliable separation of species. Females of this subgroup can be recognised also morphologically by saws and tendency to have a relatively long malar space compared to most other species in the *bergmanni* and *oligospila* groups.

Phylogeny of the *bergmanni* and *oligospila* groups

Based on three genes (COI, NaK, POL2), the branching order at the base of *Euura* phylogeny is poorly resolved, but several strongly supported groups can be identified, such as the *bergmanni* and *oligospila* groups (Fig. 1). Both groups were strongly supported as monophyletic also by all three genes analysed separately (not shown). Females of the *bergmanni* and *oligospila* groups can be very difficult to distinguish despite being distantly related (as suggested by estimated branch lengths: Fig. 1) within *Euura*. Because the phylogenetic relationships among these and other *Euura* species groups remain unresolved based on current data, it cannot be said whether high morphological similarity between the *bergmanni* and *oligospila* groups is because of convergence, parallelism, retention of ancestral characters, or some other reason.

Because of clear conflict between mitochondrial and nuclear data within the *bergmanni* and *oligospila* groups themselves, we analysed these gene sets separately for each group. Within the *bergmanni* group, the *viridis* subgroup is the only relationship above species level that is strongly supported both by COI and nuclear genes. The other relationships are poorly supported or even strongly contradictory (Fig. 2). Species outside the *viridis* subgroup are all monophyletic based on all genes, although identification of specimens of *sylvestris*, *leptocephalus*, and *bergmanni* from North America

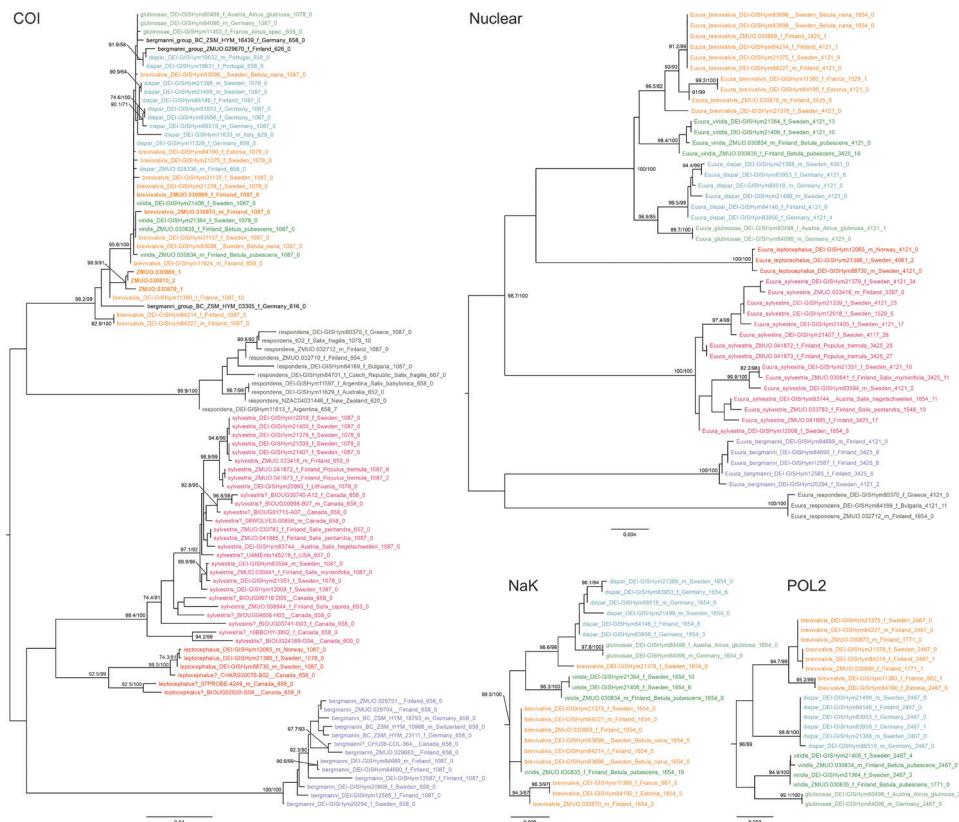


Figure 2. Maximum likelihood trees of *Euura bergmanni* group (COI left, nuclear NaK and POL2 upper right) and *viridis* subgroup (NaK lower left, POL2 lower right). Numbers at branches show SH-aLRT support (%) / ultrafast bootstrap support (%) values. Support values for weakly supported branches (<90) are not shown. Letters “f” and “m” stand for “female” and “male” if known. Numbers at the end of the tip labels refer to the length of the sequence and the number of ambiguous positions (e.g., heterozygosities). Note the COI heteroplasmic variants for *brevivalvis* ZMUO.030869 and ZMUO.030870 (in bold).

based on barcodes (no nuclear data available) is uncertain, as we have not examined these specimens (available photos in BOLD are at least consistent with the identities suggested by barcodes). COI barcodes do not allow species identification within the *viridis* subgroup (Fig. 2), where most specimens (containing all species) fall within a tight cluster of similar sequences (divergence less than 1.8%). A smaller number of COI sequences within the *viridis* subgroup (Fig. 2) are more divergent (up to 3.4%), although interestingly there are specimens that appear to contain two or more COI variants (differing by 0.5–2.3%) falling within the main cluster as well as outside of it (see further discussion under the section “Possible heteroplasmy and NUMTs in *Euura*”). All *viridis* subgroup species are monophyletic based on combined analysis of both nuclear genes and based on POL2 only (Fig. 2). NaK, however, does not clearly separate the *viridis* subgroup species, as these tend to be in multiple clusters

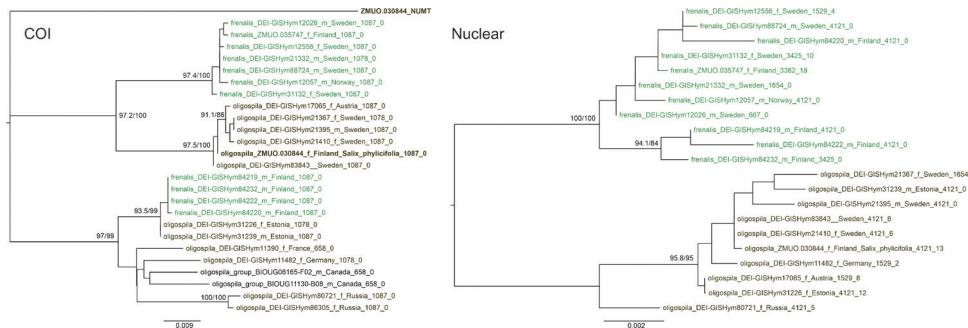


Figure 3. Maximum likelihood trees of *Euura oligospila* group based on COI (left) and nuclear genes (NaK and POL2, right). Numbers at branches show SH-aLRT support (%) / ultrafast bootstrap support (%) values. Support values for weakly supported branches (<90) are not shown. Letters “f” and “m” stand for “female” and “male” if known. Numbers at the end of the tip labels refer to the length of the sequence and the number of ambiguous positions (e.g., heterozygosities). Note the COI NUMT for *oligospila* ZMUO.030844 (in bold).

(Fig. 2). In the *oligospila* group, there are two main clusters based on COI (excluding the possible NUMT) and nuclear genes, but specimen composition differs between the marker sets (Fig. 3). According to COI, both main clusters contain both species (*frenalis* and *oligospila*), but according to nuclear genes (combined analyses or separate) the species are monophyletic (Fig. 3). Nevertheless, unlike in the *viridis* subgroup, COI may still enable identification of *oligospila* group species, at least in most cases. At least in Europe, *frenalis* appears to be restricted to two COI clusters, one of which is quite distinct (minimum distance 3.65% to a cluster containing apparently only *oligospila*), while the other is hardly different (0.3%) from some *oligospila* specimens (Fig. 3). Sequences of eight specimens of *oligospila* in BOLD are apparently NUMTs because they include a stop codon and in some cases also indels (insertions or deletions). For another specimen (ZMUO.030844), two COI variants were co-amplified and sequenced, one of which belonged to the NUMT cluster and the other to one of the *oligospila* clusters (Fig. 3).

Delimitation of species

Unfortunately, mitochondrial COI data is unreliable for species delimitation as it often conflicts with morphology and nuclear data, which is a common pattern in sawflies (Linnen and Farrell 2007; Prous et al. 2017, 2020). Due to the high degree of similarity among females of the *bergmanni* and *oligospila* groups, and poor resolution of DNA barcoding, we have primarily relied on male penis valves and nuclear sequence data to delimit species. There are usable morphological characters to distinguish also females, but these tend to be less reliable than penis valve characters in males. Close congruence between morphology and two independent nuclear markers (and often also mitochondrial COI) enabled us to delimit species rather reliably (see individual species treatments for details). Nuclear sequence data is informative



Figure 4. *Euura dispar* DEI-GISHym83956, female, photographed shortly after killing in a freezer.

about within-species variation even without prior knowledge about species boundaries, because the number of variable sequence positions (due to heterozygosity) of heterozygous females (males are haploid) can be counted. When considering mean or maximum distances within species, either based on all specimens or counting heterozygous positions in females individually, the values are remarkably similar. In the *oligospila* group, all the females are heterozygous with mean and maximum distances between haplotypes of 0.28 and 0.53%. The same within-species distance values for all specimens of the *oligospila* group are 0.22 and 0.68%. In the *bergmanni* group, 94% of the females are heterozygous with mean and maximum distances between haplotypes of 0.29 and 0.83%. The same within-species distance values for all specimens of the *bergmanni* group are 0.11 and 1.09%. In other words, haplotypes within a single female are, on average, about as distant as two different specimens of the same species.

Confusion about the use of names

Due to the high degree of similarity of females in the *bergmanni* and *oligospila* groups, many of the names have confusing histories, and misinterpretations are also common in the recent literature. Here, only the more prominent or recent examples will be discussed. Particularly, there has been confusion about the identity of the invasive willow sawfly in the southern hemisphere (South America, southern Africa, Australia, New Zealand), which we here identify as *Euura respondens* (Förster, 1854). The name *Nematus oligospilus* [= *E. oligospila* (Förster, 1854)] has been incorrectly used for this sawfly in the southern hemisphere due to the high degree of similarity between females of *E. oligospila* and *E. respondens*. These two species prove to be genetically distant within *Euura* (Fig. 1) and can also be clearly separated based on penis valves (males of *E. respondens* are not known in the introduced parthenogenetic populations in the southern hemisphere). Accordingly, the nominal species *Nematus desantisii* Smith, 1983 described from Argentina, is here treated as a synonym of *E. respondens* and

not of *E. oligospila*. There are further name mix-ups involving other *bergmanni* group species. Macek et al. (2020) used the name *Nematus viridis* for a species here called *E. dispar*, and the name *N. breviseta* for *E. viridis*. In using the name *N. breviseta*, Macek et al. (2020) seem to have relied on Zhelochovtsev (1988), where the name *N. viridis* is not even used. Benson (1958) did use the name *N. viridis*, but did not recognise *E. dispar*. Confusingly, Benson's (1958) drawing of the penis valve of *N. viridis* actually represents *E. bergmanni* (copied by Lacourt 2020). Benson apparently had not seen or recognised males of *E. viridis* and *E. dispar*.

Possible heteroplasmy and NUMTs in *Euura*

Remarkably, multiple mitochondrial COI variants are frequently observed within individuals of *Euura* (unpublished), including in the *bergmanni* and to a lesser extent in the *oligospila* groups. The *viridis* subgroup of the *bergmanni* group is the most problematic in this regard, where many individuals have secondary peaks in Sanger chromatograms, indicating the presence of multiple variants. Usually, the secondary peaks are rather weak, enabling the determination of the dominant variant, but sometimes different variants are represented at similar frequencies, making it necessary to code variable sequence positions with IUPAC ambiguity symbols. Some of the specimens referred to here were re-amplified and sequenced with Nanopore technology, enabling us to determine the exact variants and place them in the tree (Figs 2, 3). Nanopore sequencing even revealed more than two variants per individual in one case (ZMUO.030870), which Sanger sequencing cannot indicate reliably. The intra-individual COI variants in the *viridis* subgroup could indicate genuine heteroplasmy rather than nuclear-encoded mitochondrial pseudogenes (NUMTs), because the variants have neither stop codons, nor frame shifting indels, and are not in any other way unusual in the *viridis* subgroup context, i.e. do not have unusual nucleotide composition or display long branches in the tree. Interestingly, clear unreliability of mitochondrial COI barcodes in indicating species identity is also restricted to the *viridis* subgroup. If the mis-match between mitochondrial and nuclear sequences with respect to species boundaries in the *viridis* subgroup is mainly due to occasional hybridisations between species (a pattern expected in theory for haplodiploid species and at least partly supported by empirical studies; Linnen and Farrell 2007; Patten et al. 2015; Prous et al. 2020), then this could also explain the presence of extensive heteroplasmy, that has been suggested to be more likely when heterospecific hybridization has occurred (Ladoukakis and Zouros 2017; Mastrantonio et al. 2019). In the *oligospila* group there appears to be a cluster of divergent NUMTs, because all of them contain the same in-frame stop codon as well as in some cases the same frame shifting indels (see the specimens listed under *E. oligospila*). These possible NUMTs can co-amplify with the genuine COI sequence (ZMUO.030844; Fig. 3) or amplify instead of the mitochondrial variant (eight specimens in BOLD).

Identification keys to *bergmanni* and *oligospila* group females and males

Females

Abdomen posteriorly with modified segments 8–9 forming the ovipositor and its sheath (Fig. 5A). Length 4.5–9.0 mm. With the exception of *E. leptocephalus* the species are extensively green in life (only exceptionally yellow) and yellowish when dried. Clypeus emarginate ventrally; flagellum 2.6–3.4 times as long as head width; malar space 1.1–2.2 times as long as diameter of front ocellus; claws bifid (West Palaearctic taxa); valvula 3 dorsally roughly 1.5–2.0 times as broad as a cercus, weakly tapering, and without invagination posteriorly; lancet with 16–21(22) serrulae, and long and narrow in most species.

- 1 a Head and thorax mostly reddish (Fig. 17A, B).
 b Abdomen dorsally mostly black (Fig. 17A).
 c Frontal area between antennae protruding less abruptly below (Fig. 5I)
 d Arctic species 2
- aa Head and thorax mostly yellowish to mostly black (pale parts can be green in life) (e.g. Figs 4, 14A–D)
 bb Abdomen completely pale to dorsally mostly black (pale parts usually green in life) (e.g. Figs 4, 14C, 20A)
 cc Frontal area between antennae protruding more abruptly below (Fig. 5J)
 dd Temperate and arctic species 3
- 2(1) a Dorsal margin of lancet angulate at about second or third serrula from apex, apical sutures distinctly inclined apically (Fig. 6B)
 b Valvula 3 in dorsal view narrow (Fig. 5B).....
 *E. leptocephalus* (*bergmanni* group)
- aa Dorsal margin of lancet **not** angulate at about second or third serrula from apex, apical sutures **not** distinctly inclined apically (Fig. 7A)
 bb Valvula 3 in dorsal view **usually** broad at base (Fig. 5C, D).....
 **similar species mostly in *flavescens* group (*E. reticulata*, *E. lienterica* in part, *E. pallidior*...)**
- 3(1) a Tip of lancet rather broad and dorsally abruptly narrowing (Fig. 8A–C) or broad and round (Fig. 8D)
 b Serrulae apically protruding **and / or** with large microdenticles (Fig. 8)
 c Malar space 1.5–2.2 times as long as diameter of front ocellus (Fig. 5K, O) 4
- aa Tip of lancet usually narrower, acute, and dorsally narrowing less abruptly (Figs 6A, 9)
 bb Serrulae apically not protruding and with small microdenticles (Figs 6A, 9)
 cc Malar space 1.1–2.0 times as long as diameter of front ocellus (Fig. 5L–N, P) 7

- 4(3) a Valvula 3 in lateral view shorter (Fig. 5F)
 b Lancet shorter and broader (Fig. 8D) *E. brevivalvis*

– aa Valvula 3 in lateral view longer (Fig. 5G)
 bb Lancet longer and narrower (Fig. 8A–C) 5 [the following three species not definitely morphologically separable]

5(4) a Slightly larger denticles of serrulae (uncertain) (Fig. 8A) *E. dispar*
 aa Slightly smaller denticles of serrulae (uncertain) (Fig. 8B, C) 6

6(5) a On *Betula* (morphological differences unknown) *E. viridis*
 aa On *Alnus* (morphological differences unknown) *E. glutinosae*

7(3) a Ventral part of 2nd to 4th suture of lancet oblique and more or less straight or weakly curved **apically** (Fig. 9C)
 b Gap between serrulae relatively large (Fig. 9C)
 c Head dorsally more rounded (Fig. 5Q) *E. respondens*
 aa Ventral part of 2nd to 4th suture of lancet in most cases weakly or distinctly curved **basally** (Figs 6A, 9A, B, D)
 bb Gap between serrulae large or small (Figs 6A, 9A, B, D)
 cc Head dorsally rounded or rectangular (Fig. 5R–T) 8

8(7) a Lancet usually relatively broad (Fig. 6A)
 b Sutures of basal annulets **usually** weakly bent (Fig. 6A)
 c Gap between serrulae small, relative to length of serrulae (Fig. 6A)
 *E. bergmanni*

– aa Lancet narrower (Fig. 9A, B, D)
 bb Sutures of basal annulets distinctly bent (Fig. 9A, B, D)
 cc Gap between serrulae small or large, relative to length of serrulae (Fig. 9A, B, D) 9

9(8) a Malar space more than 1.4 times as long as diameter of front ocellus (Fig. 5P)
 b Clypeus usually less deeply emarginate (Fig. 5P)
 c Head in dorsal view more rectangular (Fig. 5S) *E. sylvestris*

– aa Malar space less than 1.5 times as long as diameter of front ocellus (Fig. 5L)
 bb Clypeus usually more deeply emarginate (Fig. 5L)
 cc Head in dorsal view more rounded (Fig. 5T) ... **oligospila group** 10

10(9) a Gap between serrulae smaller compared to length of serrulae (Fig. 9A)
 b Terga 1–8 dorsally **usually** completely black (Fig. 21E) *E. frenalis*
 aa Gap between serrulae larger compared to length of serrulae (Fig. 9B)
 bb Terga 1–8 dorsally usually nearly completely pale or with narrow black median line (Fig. 21A) *E. oligospila*

Males

Abdomen posteriorly with a genital capsule, ventrally covered by undivided sternum 9 (Fig. 10A). Length 4.5–8.0 mm. From nearly completely black to mostly pale (pale colour yellowish to brown; not, at least in Europe, green in life). Clypeus emarginate ventrally; flagellum 3.6–4.3 times as long as head width; malar space 1.0–1.9 times as

long as diameter of front ocellus (Fig. 10I–L); claws bifid; tergum 8 with distinct apical projection (Fig. 10B–D); penis valves as in Figs 11, 12A, B.

- 1 a Pronotum black (Fig. 17E) as well as most of body (Fig. 17C, D)
 - b Paravalva basally with two-digit extension (Fig. 11I) *E. leptcephalus*
- aa Pronotum extensively pale, often also rest of body (e. g. Figs 13E, 19E)
 - bb Paravalva basally simple (Figs 11A–H, 11J, 12A, B) 2
- 2(1) a Pterostigma more or less uniformly pale (Figs 13G, 18C) 3
 - aa Pterostigma dark brown to black, sometimes centrally somewhat paler (e.g. Figs 13E, 14E) 11
- 3(2) a Valviceps basally about as broad as apically and with weak or distinct constriction in middle (Fig. 12A, B)
 - b Invagination between valvispina and paravalva indistinct (Fig. 12A, B)
 - c Apical projection of tergum 8 about as broad as long or slightly longer than broad and about 0.5 times as long as tergum 8 (Fig. 10B, C) ... *oligospila* group 4
- aa Valviceps often basally narrower than apically and without distinct constriction in middle (Fig. 11)
 - bb Invagination between valvispina and paravalva distinct or indistinct (Fig. 11)
 - cc Apical projection of tergum 8 about as broad as long or distinctly longer than broad and about 0.3–0.5 times as long as tergum 8 (Fig. 10D) 5
- 4(3) a Valvispina possibly broader at base (Fig. 12A)
 - b Mesepisternum (usually?) extensively pale (Fig. 21D) *E. oligospila*
 - aa Valvispina possibly narrower at base (Fig. 12B)
 - bb Mesepisternum **usually** black (Fig. 21H) *E. frenalis*
- 5(3) a Valvispina short (Fig. 11D, E) and invagination between valvispina and paravalva shallow (Fig. 11D, E)
 - b Head in dorsal view rectangular (Fig. 10E)
 - c Antennae black or slightly pale ventrally (Fig. 14F)
 - d 6.0–8.0 mm *E. brevivalvis*
- aa Penis valve with different combination of characters (Fig. 11A–C, F–H, J)
 - bb Head in dorsal view rectangular to square or round (Fig. 10F, G)
 - cc Antennae **usually** distinctly pale at least ventrally (e.g. Figs 18C, D, 15D)
 - dd 4.5–8.0 mm 6
- 6(5) a Pseudoceps apically with distinct filament-like constriction (Fig. 11J)
 - b Invagination between valvispina and paravalva distinct (Fig. 11J)
 - c Valvispina distinctly dorsally directed (Fig. 11J) *E. respondens*
- aa Pseudoceps apically without filament-like constriction (Fig. 11A, C, F–H)
 - bb Invagination between valvispina and paravalva distinct or indistinct (Fig. 11A–C, F–H)
 - cc Valvispina in most species not dorsally directed (Fig. 11A–C, F–H) 7
 - a Invagination between valvispina and paravalva indistinct (Fig. 11F–G)
- 7(6)

- b Valvispina relatively short (Fig. 11F, G)
- c Paravalva apically distinctly broader than basally (Fig. 11F,G).... *E. sylvestris*
- aa Invagination between valvispina and paravalva distinct (Fig. 11A–C, H)
- bb Valvispina relatively long (Fig. 11A–C, H)
- cc Paravalva apically distinctly broader than basally or about as broad as basally (Fig. 11A–C, H)..... 8
- 8(7) a Dorsal margins of valvura and pseudoceps distinctly angled (Fig. 11A)
- b Valvispina somewhat directed dorsally (Fig. 11A) *E. bergmanni*
- aa Dorsal margins of valvura and pseudoceps not angled (Fig. 11B, C, H)
- bb Valvispina not directed dorsally (Fig. 11B, C, H)..... 9
- 9(8) a Invagination between valvispina and paravalva deep (Fig. 11B).... *E. dispar*
- aa Invagination between valvispina and paravalva shallower (Fig. 11 C, H) ...10
- 10(9) a Gap between valvispina and paravalva possibly smaller (Fig. 11C)
- b On *Betula* *E. viridis*
- aa Gap between valvispina and paravalva possibly larger (Fig. 11H)
- bb On *Alnus* *E. glutinosae*
- 11(2) a Valvispina long and somewhat directed dorsally (Fig. 11A)
- b Malar space 1.0–1.4 times as long as diameter of front ocellus (Fig. 10J)..... *E. bergmanni*
- aa Valvispina long and not directed dorsally, or short and somewhat directed dorsally (Fig. 11B, D, E)
- bb Malar space 1.3–1.9 times as long as diameter of front ocellus (Fig. 10I) 12
- 12(11) a Valvispina long (Fig. 11B)
- b Invagination between valvispina and paravalva deep (Fig. 11B)
- c Antennae **usually** distinctly pale at least ventrally (Fig. 15D) *E. dispar*
- aa Valvispina short (Fig. 11D, E)
- bb Invagination between valvispina and paravalva shallow (Fig. 11D, E)
- cc Antennae black or slightly pale ventrally (Fig. 14F) *E. brevivalvis*

Taxonomy

Euura Newman, 1837

Euura bergmanni group

The group is mostly defined based on phylogenetic analyses of sequence data (Fig. 1). No clear female morphological characters distinguish it from the highly similar but distantly related *oligospila* group. Similarly, there are no clear characters in males that would uniquely define males of the *bergmanni* group, but penis valves together with external morphology enable reliable separation of the species from other *Euura*. With the possible exceptions of *E. brevivalvis* and *E. leptocephalus*, the species usually have

multiple generations per year (as far as the length of the season allows this). Known larval host plants are all Salicaceae or Betulaceae. Larvae are cryptically coloured, solitary, and at least the later instars feed mostly from the edges of leaves. The group has a natural distribution in the Holarctic.

***Euura bergmanni* (Dahlbom, 1835)**

Figs 5M, N, R, 6A, 10F, J, 11A, 13, 22

Nematus bergmanni Dahlbom, 1835: 24–25. Type locality: Sweden, Lund area. LT designated below.

Nematus virescens Hartig, 1837: 217. Type locality: not stated, but presumably Germany according to the title of Hartig's publication. LT designated below.

Nematus pallicarpus Hartig, 1837: 215–216. Type locality: "in hiesiger Gegend" [Germany, Berlin area]. LT designated by Haris (1997).

Nematus validicornis Förster, 1854a: 341–342. Type locality: Germany, Aachen area. LT designated below. Syn. nov.

Nematus curtispina Thomson, 1871: 152–153. Type locality: "Probably as widespread as the previous species" [translated from Swedish], which presumably refers to *N. brevivalvis*: "Probably occurs throughout Scandinavia" [translated from Swedish]. LT designated below.

Nematus varipictus Holmgren, 1883: 147, Plate 2, Fig. 12. Type locality: Matotschkin Scharr [Russia, Novaya Zemlya, Matochkin Strait]. 2 ST females were in NHRS (Lindqvist 1944), but could not recently be found. Synonymy with *Pteronidea curtispina* by Lindqvist (1944).

Nematus anthophilus Zaddach, 1884 [in Brischke 1884]: 163–164. Type locality: not stated. Type material probably destroyed (Blank and Taeger 1998). Synonymy with *Pteronus curtispinis* (Thomson) by Konow (1903b).

Amauronematus longicornis Konow, 1897: 179. Type locality: Russia, Irkutsk. LT designated below.

Lygaeonematus pallens Enslin, 1916: 500–501. Type locality: Germany, Dessau. LT designated by Taeger and Blank (1998).

Pteronidea curtispina var. *luctuosa* Enslin, 1916: 455. Type locality: Germany, Bavaria, Fürth. LT designated below.

Pteronidea vernalis Lindqvist, 1937: 130–132. Type locality: southern Finland (HT). Not found in MZH. Synonymised with *Pteronidea curtispina* by Lindqvist (1941).

Similar species. Females are most similar to *oligospila* group, *E. respondens*, and *E. sylvestris*. Head more rectangular in dorsal view compared to *oligospila* group and *E. respondens*. Lancet usually broader and basal annular sutures usually less bent compared to *E. sylvestris* and *E. respondens*. Gap (cypella) between serrulae small compared to *oligospila* group. Males distinguishable from other species by distinct penis valves (see key). Length of postocellar area in *E. bergmanni* is not a reliable character to distinguish

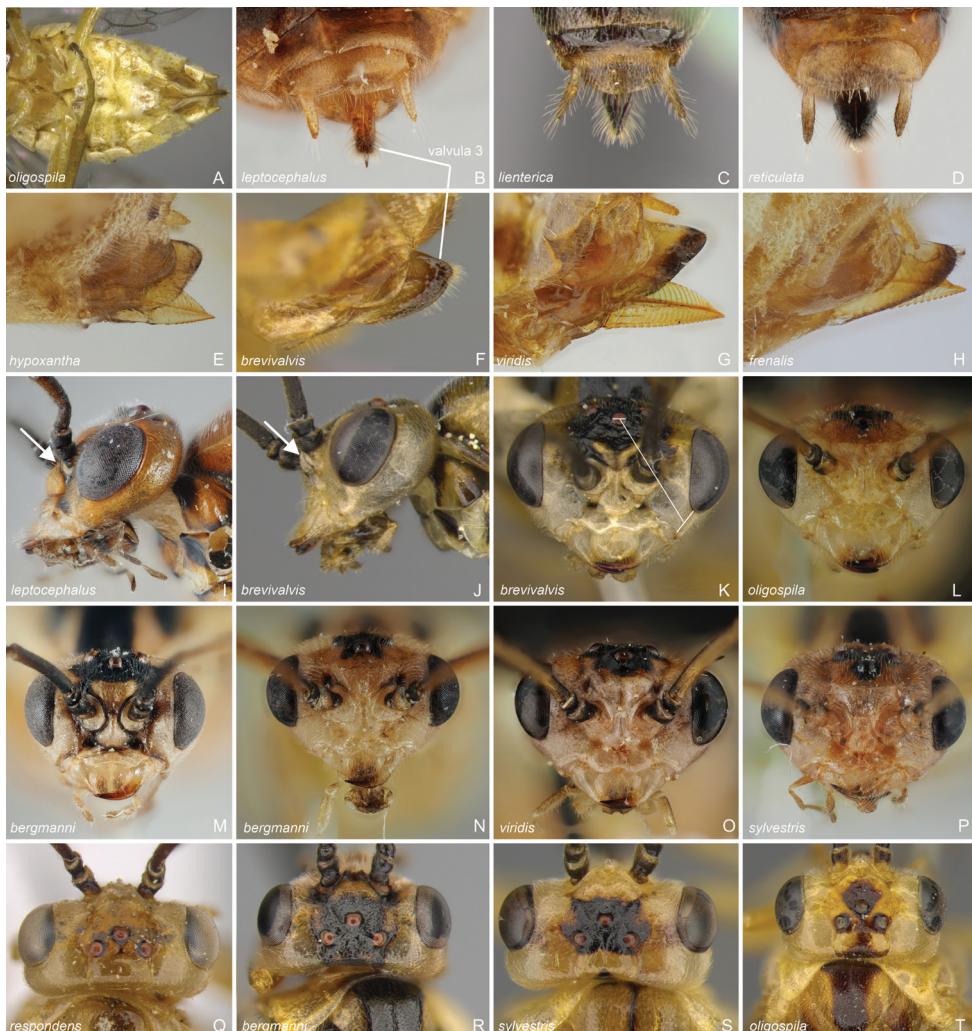


Figure 5. Characters of *Euura hypoxantha*, *bergmanni* and *oligospila* groups, females **A** *oligospila* DEI-GISHym84738 **B** *leptocephalus* ZMUO.033448 **C** *lienterica* DEI-GISHym21362 **D** *reticulata* ZMUO.033533 **E** *hypoxantha* ZMUO.035686 **F** *brevivalvis* DEI-GISHym31135 **G** *viridis* ZMUO.035636 **H** *frenalis* ZMUO.035931 **I** *leptocephalus* ZMUO.033448 **J** *brevivalvis* DEI-GISHym84214 **K** *brevivalvis* DEI-GISHym84214 **L** *oligospila* ZMUO.040699 **M** *bergmanni* ZMUO.033423 **N** *bergmanni* ZMUO.040825 **O** *viridis* ZMUO.035636 **P** *sylvestris* ZMUO.038944 **Q** *respondens* <http://coll.mfn-berlin.de/u/111027> **R** *bergmanni* DEI-GISHym31138 **S** *sylvestris* DEI-GISHym21351 **T** *oligospila* DEI-GISHym88899.

it at least from *E. sylvestris*. Females of overwintering generation are dorsally largely black, the later generations largely or nearly completely pale (pterostigma is always pale). Males of overwintering generation are largely black (except legs and abdomen ventrally to various degrees), including pterostigma; the later generations are ventrally largely or nearly completely pale (including pterostigma) but dorsally mostly black. At

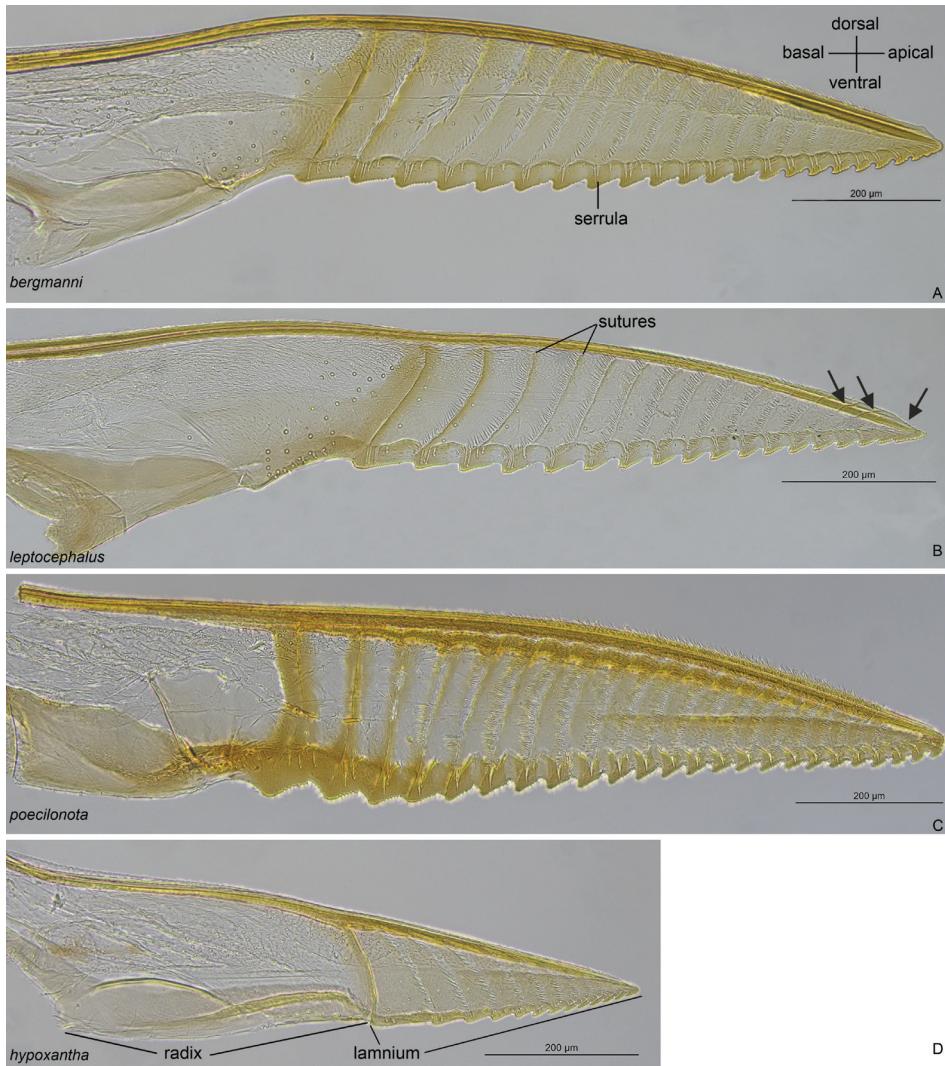


Figure 6. Lancets of *Euura*. **A** *bergmanni* DEI-GISHym12585 **B** *leptocephalus* holotype NHRS-HE-VA000003974 **C** *poecilonota* DEI-GISHym21400 **D** *hypoxantha* DEI-GISHym12505.

least in females there tend to be distinct differences between the generations also in the length of malar space and perhaps postocellar area. In overwintering generations, the malar space tends to be distinctly shorter (Fig. 5M) than in later generations (Fig. 5N).

Genetic data. COI. Based on 13 specimens, maximum within species distance is 3.65% and the nearest neighbour, diverging by a minimum of 7.1%, is the *viridis* subgroup. Only one BIN: [BOLD:AAG3539](#).

Nuclear. Based on 5 specimens, maximum within species distance is 0.19% (0.23% based on haplotypes of individual females). The nearest neighbour, diverging by a minimum of 3.5%, is *viridis*.



Figure 7. Lancets of *Euura*. **A** *reticulata* PR.588VV **B** *pallens* lectotype GBIF-GISHym3863.

Host plants and behaviour. Hosts: a wide variety of *Salix* species, including *alba*, *fragilis* (Weiffenbach 1985), *aurita*, *viminalis* (Boevé 1990), *caprea*, *pentandra*, *phylicifolia* (Kangas 1985), and *purpurea* (Benander 1966). Lindqvist (1956) recorded up to four generations per year in Finland. Lindqvist (1941) stated that adults from the over-wintering generation were very much darker than the next generation, and that adults of the 3rd and 4th generations were paler still. The characteristic continuous double dorsal line of the larva makes their identification usually straightforward. This double line is usually white in early generation larvae, but pink or even red in later generations.

Distribution. Palaearctic (Taeger et al. 2006; Sundukov 2017), possibly also Nearctic (one barcoded larva in BOLD, CHU06-COL-364). Specimens studied are from Finland, Germany, Russia (Irkutsk Oblast), Sweden, Switzerland, United Kingdom.

Type material. *Nematus bergmanni* Dahlbom, 1835. **Lectotype**, here designated, ♀, MZLU2017334, MZLU. Dahlbom cited a publication by Bergman (1763), in which adults were mentioned, which Dahlbom considered to belong to this species. There is no trace of Torben Bergman material in the UUZM collection (Hans Meljon, personal communication: March 11, 2019). Following this citation, Dahlbom described a larva, evidently from his original observations: "Larva prasina linea dorsali lata livida vel purpurascente et utrinque fusco-marginata" [Larva leek green with broad blue or purplish band and dark-bordered at both sides], with the additional information [translated from Latin] "Frequently observed on willows around Lund in Scania from 26 August to 2 October". Although a label on the lectotype bears the date "14 Aug.", this might refer to the date of emergence of an adult reared from a larva, and therefore does not necessarily contradict Dahlbom's statement.

Nematus virescens Hartig, 1837. **Lectotype**, here designated, ♀, GBIF-GISHym3456, ZSM. Koch (2000) mentioned this same specimen as LT, with details of its labelling, together with 2 "Paratypen". This was not, however, a valid taxonomic act, because he omitted an explicit statement that he was designating this specimen (see ICZN 2003).

Nematus pallicarpus Hartig, 1837. LT, “Cotype”, “*Nematus pallicarpus* Htg. Th. Hartig det.”, “*Pteronidea curtispina* Th. E. Clément det.”, DEI-GISHym84734, ZSM. 6 female paralectotypes with similar labels to LT. Three males with similar labels cannot be syntypes: Hartig described only the female sex.

Nematus validicornis Förster, 1854. **Lectotype**, here designated, ♂, GBIF-GISHym3451, ZSM.

Nematus curtispina Thomson, 1871. **Lectotype**, here designated, ♀, MZLU2017334, MZLU [the same specimen as the LT of *bergmanni* Dahlbom]. Koch (2000) mentioned this same specimen as LT, with details of its labelling. This was not, however, a valid taxonomic act, because he omitted an explicit statement that he was designating this specimen (see ICZN 2003).

Amauronematus longicornis Konow, 1897. **Lectotype**, here designated, ♂, GBIF-GISHym3849, SDEI. Penis valve mounted on a separate slide (Symphyta Coll. Nr. 233). The lectotype designation indicated by a label by Zinovjev is unpublished. Lindqvist (1972: 71) studied this male and called it “♂-Typus”; but since he also mentioned a “♀-Typus”, which could not be found at the SDEI, his action is not a lectotype designation.

Lygaeonematus pallens Enslin, 1916. LT, ♀, DEI-GISHym84733, ZSM.

Pteronidea curtispina var. *luctuosa* Enslin, 1916. **Lectotype**, here designated, ♂, GBIF-GISHym3339, ZSM.

Euura brevivalvis (Thomson, 1871)

Figs 5F, J, K, 8D, 10E, I, 11D, E, 14, 23

Nematus brevivalvis Thomson, 1871: 151–152. Type locality: Sweden, Dalarna alpina.

LT designated below.

Pteronus kriegeri Konow, 1903a: 310 (key). Type locality: Germany, Saxony, Dorneichenbach..LT designated by Koch (2000).

Amauronematus spurcus Konow, 1904: 261. Type locality: northern Russia. LT designated below.

Pteronidea absimilis Lindqvist, 1949: 79–80. Type locality: Finland, Pihtipudas (HT).

Pteronidea woollatti Lindqvist, 1971: 11–12. Type locality: Finland, Kilpisjärvi (HT).
Syn. nov.

Nematus turgaiensis Safjanov, 1977: 98–103. Type locality: Russia, southern Kulunda steppe (ST). Syn. nov.

Similar species. Most similar species are *E. viridis*, *E. dispar*, and *E. glutinosae*, from which it differs by having a shorter valvula 3 and lancet. Males distinguishable from other species by distinct penis valves.

Genetic data. COI. Based on 13 specimens, maximum within species distance is 3.19% and the nearest neighbour, diverging by a minimum of 0%, are *dispar*, *viridis*, and possibly *glutinosae*. BINs: [BOLD:AEC8057](#), [BOLD:ABZ5797](#), [BOLD:ACF5540](#) (main cluster).

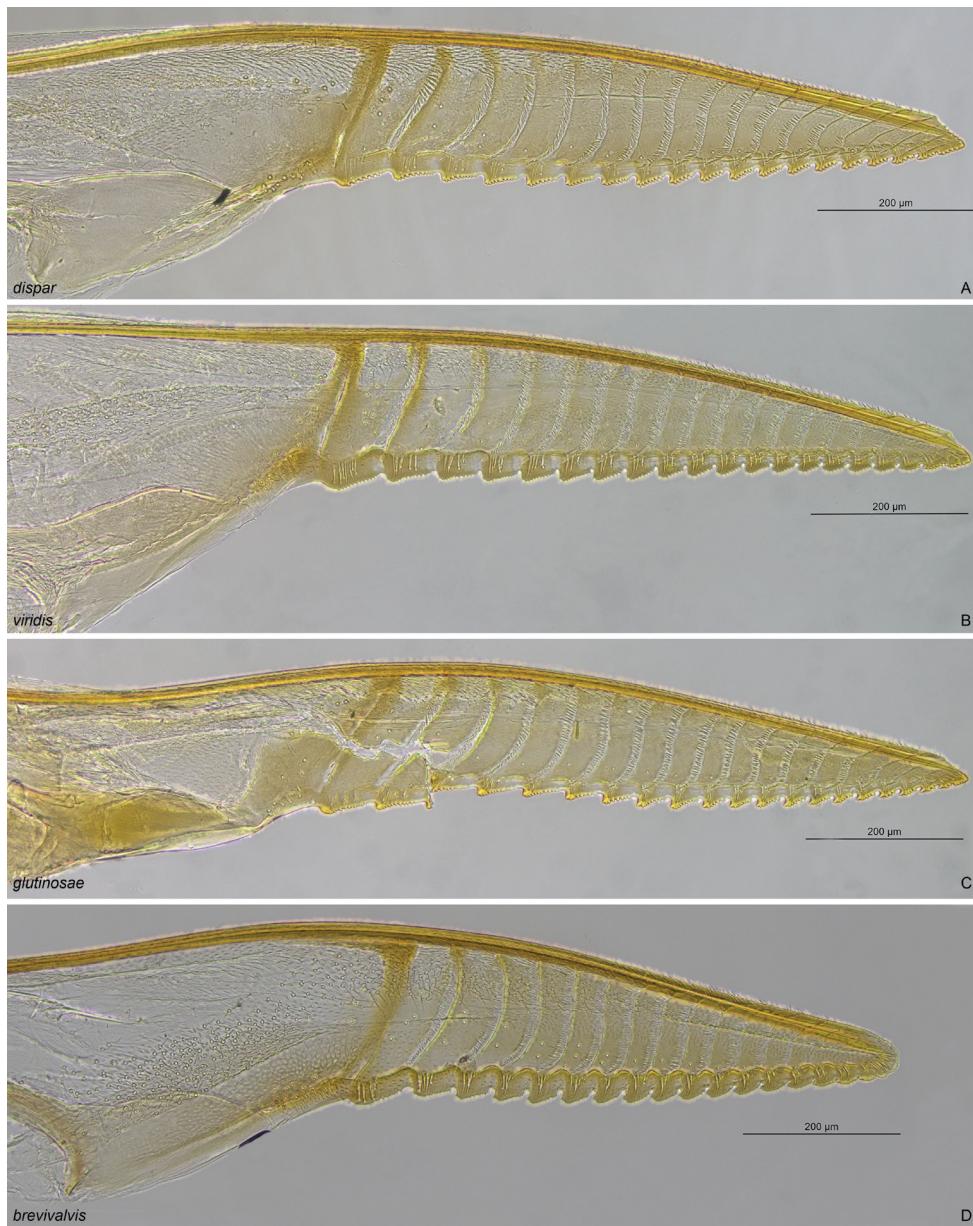


Figure 8. Lancets of *Euura bergmanni* group. **A** *dispar* DEI-GISHym84146 **B** *viridis* DEI-GISHym21364 **C** *glutinosae* DEI-GISHym80498 **D** *brevivalvis* DEI-GISHym31135.

Nuclear. Based on 10 (only NaK) or 8 (NaK and POL2) specimens, maximum within species distance is 1.09% (only NaK) or 0.92% (NaK and POL2) and 0.12% based on haplotypes of individual females. The nearest neighbour, diverging by a minimum of 0% (only NaK) or 0.41% (NaK and POL2), is *viridis*. The 0% distance

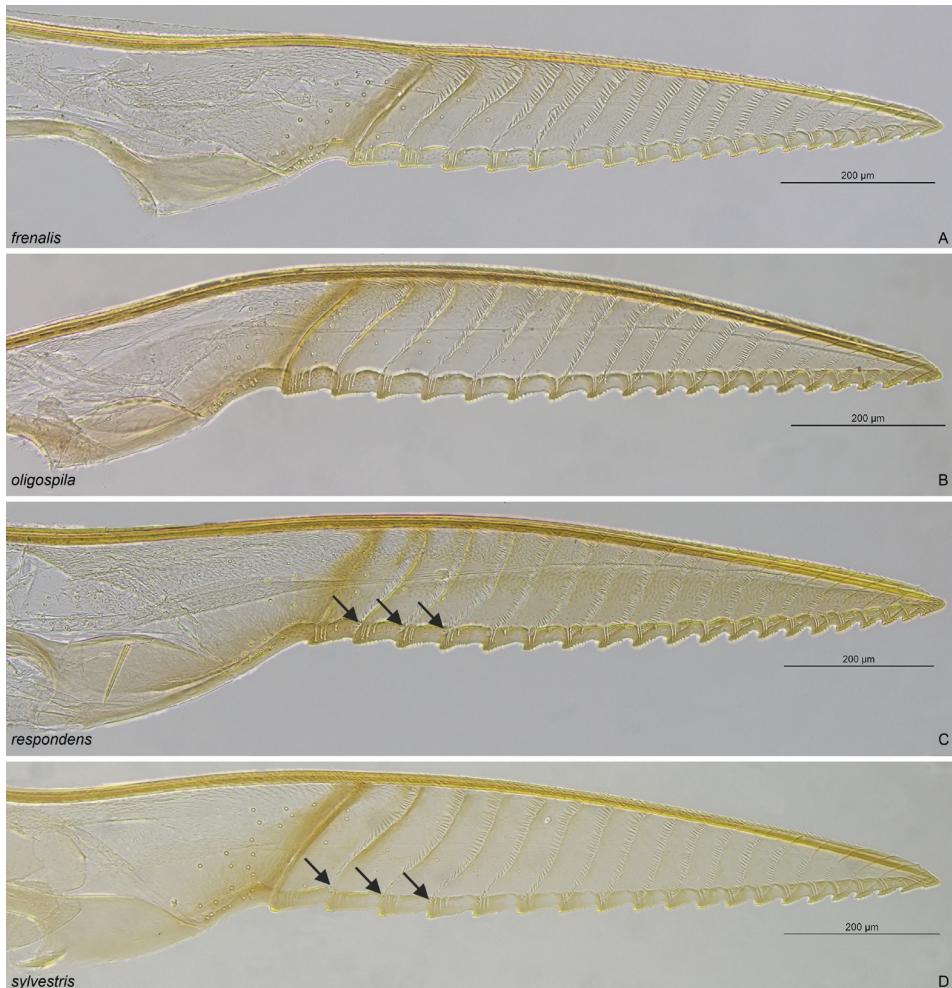


Figure 9. Lancets of *Euura oligospila* and *bergmanni* groups. **A** *frenalis* DEI-GISHym31132 **B** *oligospila* DEI-GISHym88899 **C** *respondens* DEI-GISHym11597 **D** *sylvestris* PR.574VV.

between *viridis* and *brevivalvis* for NaK is because one of the haplotypes of one female of *viridis* (ZMUO.030835) is identical to several *brevivalvis* specimens.

Host plants and behaviour. Hosts: *Betula* species, *B. pendula* (Ermolenko and Fedoryak 1988), *B. pubescens* including var. *pumila* (Kangas 1985; Lahtinen et al. 2006), *Betula nana* (this study and unpublished rearing results by V. Vikberg). In Kazakhstan and southern Siberia males are respectively very rare or scarce (Safjanov 1977; Ermolenko and Fedoryak 1988), although they are common in northern Europe (Lisson et al. 2020). One generation per year (Safjanov 1977; Macek et al. 2020).

Distribution. Palaearctic (Ermolenko and Fedoryak 1988; Taeger et al. 2006; Sundukov 2017). Specimens studied are from Estonia, Finland, France, Germany, Norway, Russia, and Sweden.



Figure 10. Characters of *Euura bergmanni* and *oligospila* groups, males. **A** *respondens* DEI-GISHym84697 **B** *oligospila* DEI-GISHym84695 **C** *frenalis* ZMUO.033184 **D** *viridis* DEI-GISHym84547 **E** *brevivalvis* DEI-GISHym11624 **F** *bergmanni* DEI-GISHym84689 **G** *respondens* DEI-GISHym84697 **H** *oligospila* DEI-GISHym84695 **I** *brevivalvis* ZMUO.039090 **J** *bergmanni* DEI-GISHym84689 **K** *sylvestris* ZMUO.035654 **L** *oligospila* DEI-GISHym84695.

Type material. *Nematus brevivalvis* Thomson, 1871. **Lectotype**, here designated, ♀, DEI-GISHym88904, MZLU. Koch (2000) mentioned this same specimen as LT, with details of its labelling. This was not, however, a valid taxonomic act, because he omitted an explicit statement that he was designating this specimen (see ICBN 2003).

Pteronidea kriegeri Konow, 1903a. LT, ♀, GBIF-GISHym3847, SDEI. Koch (2000) mentioned this same specimen as LT, with details of its labelling, and in his “Diskussion” (p. 134) validly designated it.

Amauronematus spucus Konow, 1904. **Lectotype**, here designated, ♀, GBIF-GISHym3848, SDEI. Koch (2000) mentioned this same specimen as LT, with details of its labelling, together with a female paralectotype. This was not, however, a valid taxonomic act, because he omitted an explicit statement that he was designating this specimen (see ICBN 2003).

Pteronidea absimilis Lindqvist, 1949. HT, ♀, <http://id.luomus.fi/GL.3465>, MZH.

Pteronidea woollatti Lindqvist, 1971. HT, ♀, <http://id.luomus.fi/GL.9217>, MZH. Slide preparation PR.605VV of saw by V. Vikberg. The paratype ♂ is *E. sylvestris* (<http://id.luomus.fi/GL.9216>; slide preparation PR.606VV of penis valve by V. Vikberg).

***Euura dispar* (Zaddach, 1876)**

Figs 4, 8A, 11B, 15, 24C–E

Nematus dispar Zaddach, 1876: Plate II(5), 5. Type locality: Heubude (according to Brischke 1884) [Poland, now part of Gdańsk] (ST). Type material probably destroyed (Blank and Taeger 1998).

Pteronidea pseudodispar Lindqvist, 1969: 242–245. Type locality: Finland, Helsinki, Munksnäs (HT). Syn. nov.

Similar species. Most similar species are *E. viridis* and *E. glutinosae*, from which it possibly differs by having slightly larger denticles of serrulae. Males distinguishable from other species by their distinctive penis valves.

Genetic data. COI. Based on 11 specimens, maximum within species distance is 1.75% and the nearest neighbours, diverging by a minimum of 0%, are *brevivalvis*, *glutinosae*, and *viridis*. BINs: [BOLD:AEC8057](#), [BOLD:ABZ5797](#), [BOLD:ACF5540](#) (main cluster).

Nuclear. Based on 6 specimens, maximum within species distance is 0.25% (0.15% based on haplotypes of individual females). The nearest neighbours, diverging by a minimum of 0.63%, are *brevivalvis* and *glutinosae*.

Host plants and behaviour. Hosts: *Betula pendula* (Kangas 1985) and *B. pubescens* (Kontuniemi 1960). Probably two generations per year, of which larvae identified as *pseudodispar* belong to the second generation (Lindqvist 1969).

Distribution. Palaearctic (Taeger et al. 2006; Sundukov 2017). Specimens studied are from Finland, Germany, Italy, Portugal, Sweden, and United Kingdom.

Type material. *Pteronidea pseudodispar* Lindqvist, 1969. HT, ♀, <http://id.luomus.fi/GL.3514>, MZH.

***Euura glutinosae* (Cameron, 1882)**

Figs 8C, 11H, 16, 24A, B

Nematus glutinosae Cameron, 1882: 193–194. Type locality: Great Britain, England, Worcestershire. LT designated below.

Nematus viridissimus Möller, 1882: 179. Type locality: Sweden, Skåne, Skrifvaremöllan vid Tvedörra lägerplats. LT designated by Lindqvist (1962).

Note. Cameron's article was published in February 1882, according to the issue wrappers and printed in the journal itself. Möller's article was published no earlier than mid December 1882, based on an advertisement inside front issue wrapper dated December 1882, and the proceedings of the Entomologiska Föreningen meeting on 14 December 1882 published in the same issue (pp. 195–203). The seniority of the name *glutinosae* has previously been overlooked. Loth (1913) used *Pteronus glutinosae* as the name for this taxon, and following Article 23.9 (ICZN 1999), *glutinosae* is therefore the valid species name.

Similar species. Most similar species are *E. dispar* and *E. viridis*. Compared to *E. dispar* it possibly has slightly smaller denticles of serrulae. Differences from *E. viridis*

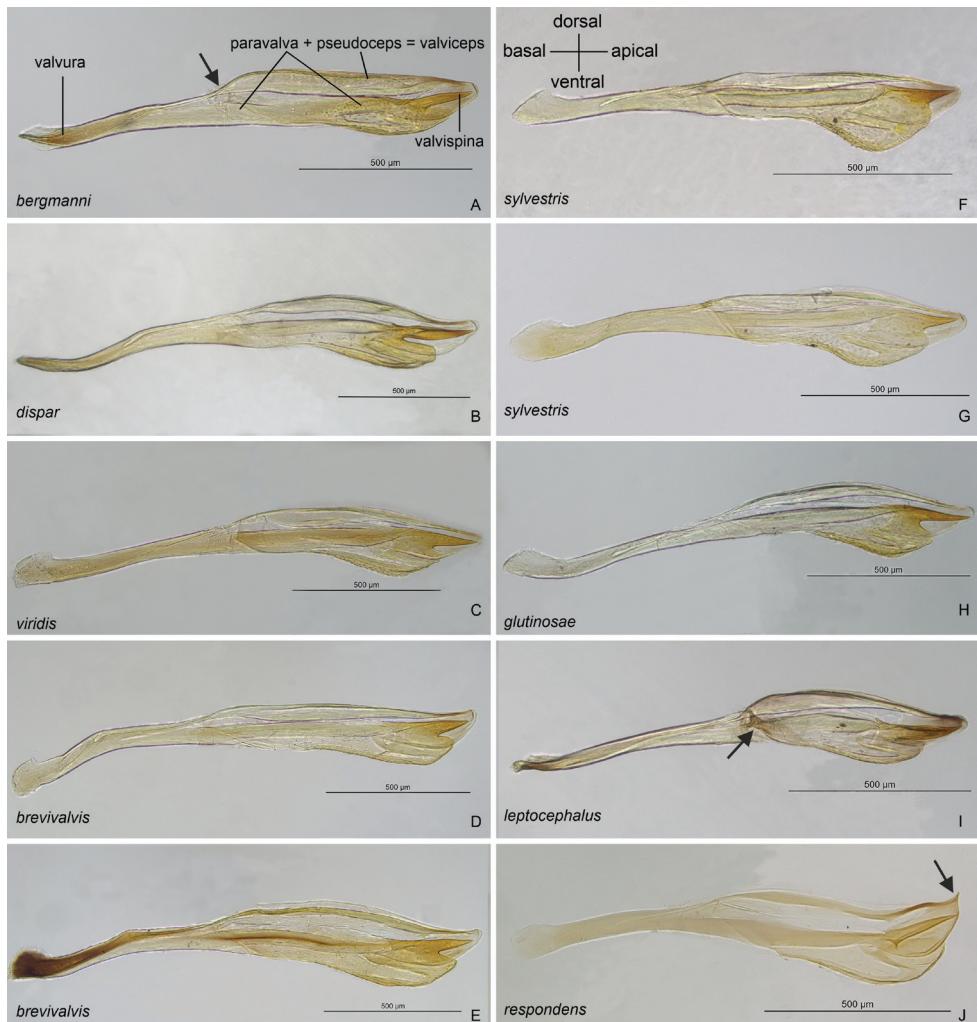


Figure 11. Penis valves of *Euura bergmanni* group. **A** *bergmanni* ZMUC.032583 **B** *dispar* DEI-GISHym88519 **C** *viridis* ZMUC.030834 **D** *brevivalvis* DEI-GISHym84227 **E** *brevivalvis* ZMUC.030870 **F** *sylvestris* DEI-GISHym83594 **G** *sylvestris* ZMUC.033416 **H** *glutinosae* DEI-GISHym84096 **I** *leptocephalus* DEI-GISHym88730 **J** *respondens* DEI-GISHym12514.

are not entirely clear. Male penis valves are most similar to *E. viridis*. There is possibly a larger gap between paravalva and valvispina compared to *E. viridis*.

Genetic data. COI. Based on 3 specimens, maximum within species distance is 0.15% and the nearest neighbour, diverging by a minimum of 0%, is *dispar*, but possibly also *brevivalvis*, and *viridis*. BINs: [BOLD:ACF5540](#) (main cluster), but possibly also [BOLD:AEC8057](#) and [BOLD:ABZ5797](#).

Nuclear. Based on 2 specimens, maximum within species distance is 0% (0.02% based on haplotypes of individual females). The nearest neighbour, diverging by a minimum of 0.63%, is *dispar*.

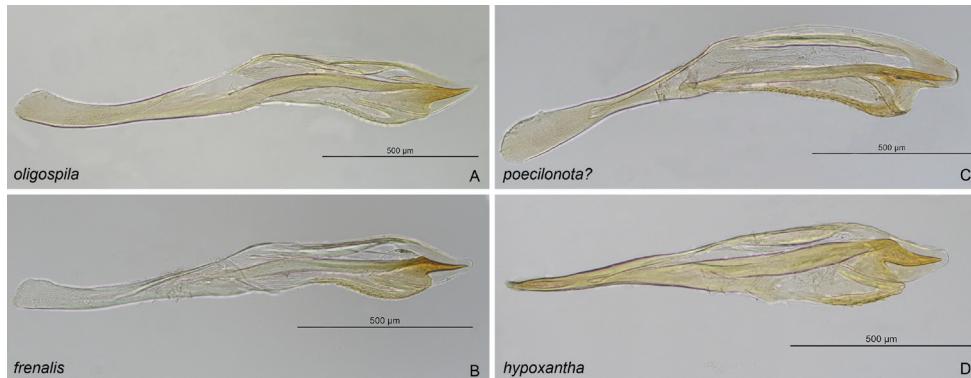


Figure 12. Penis valves of *Euura*. **A** *oligospila* DEI-GISHym21395 **B** *frenalis* DEI-GISHym12057 **C** *poecilonota?* DEI-GISHym12527 **D** *hypoxantha* syntype GBIF-GISHym3301.

Host plants and behaviour. Hosts: *Alnus* species; *A. glutinosa* (Macek et al. 2020), *A. incana* (Kangas 1985) and *A. cordifolia* (Schedl 2010). Intriguing, but requiring confirmation, are comments by Pschorr-Walcher and Altenhofer (2000), that “*Nematus prasinus*” larvae, although they strongly preferred *Alnus* species, also accepted *Betula*, *Carpinus* and *Corylus* in feeding tests. Two generations per year (Weiffenbach 1985; Pschorr-Walcher and Altenhofer 2000).

Distribution. Nearly all published records are from the West Palaearctic (Europe, Georgia, Zinovjev 1978; Taeger et al. 2006), apart from a specimen from Mongolia recorded as *Nematus viridissimus* by Haris (2002). Specimens studied are from Austria, France, Germany, Russia (Moscow Oblast), Sweden, United Kingdom.

Type material. *Nematus glutinosae* Cameron, 1882. **Lectotype**, here designated, ♀, B.M.TYPE HYM.I.623, BMNH. “Type” “B.M.TYPE HYM.1.623” “HOLOTYPE ♀ *Nematus glutinosae* Cameron det. R.B.Benson.1938” “Bred 21/9/75; the L. VIII on *Alnus glutinosa*. Worsh” “Cameron. 96-76. Worcester” “polyspila”, BMNH.

Nematus viridissimus Möller, 1882. LT, ♀ GNM-HYME000000210, GNM. Koch (2000) wrongly ascribed holotype status to this specimen. However, the discussion of the specimen as the type by Lindqvist (1962) satisfies the requirements of Article 74.6 (ICZN 1999) for the designation of a lectotype.

Euura leptocephalus (Thomson, 1863)

Figs 5B, I, 6B, 11I, 17

Nematus leptocephalus Thomson, 1863: 632. Type locality: Scandinavia, “Lapponia intermedia” (HT).

Similar species. Most similar species are *E. reticulata* and similar species in the *flavescens* group (character states in parentheses), from which it differs by having dorsal margin of lancet angulate at about second or third serrula from apex (not angulate) and apical

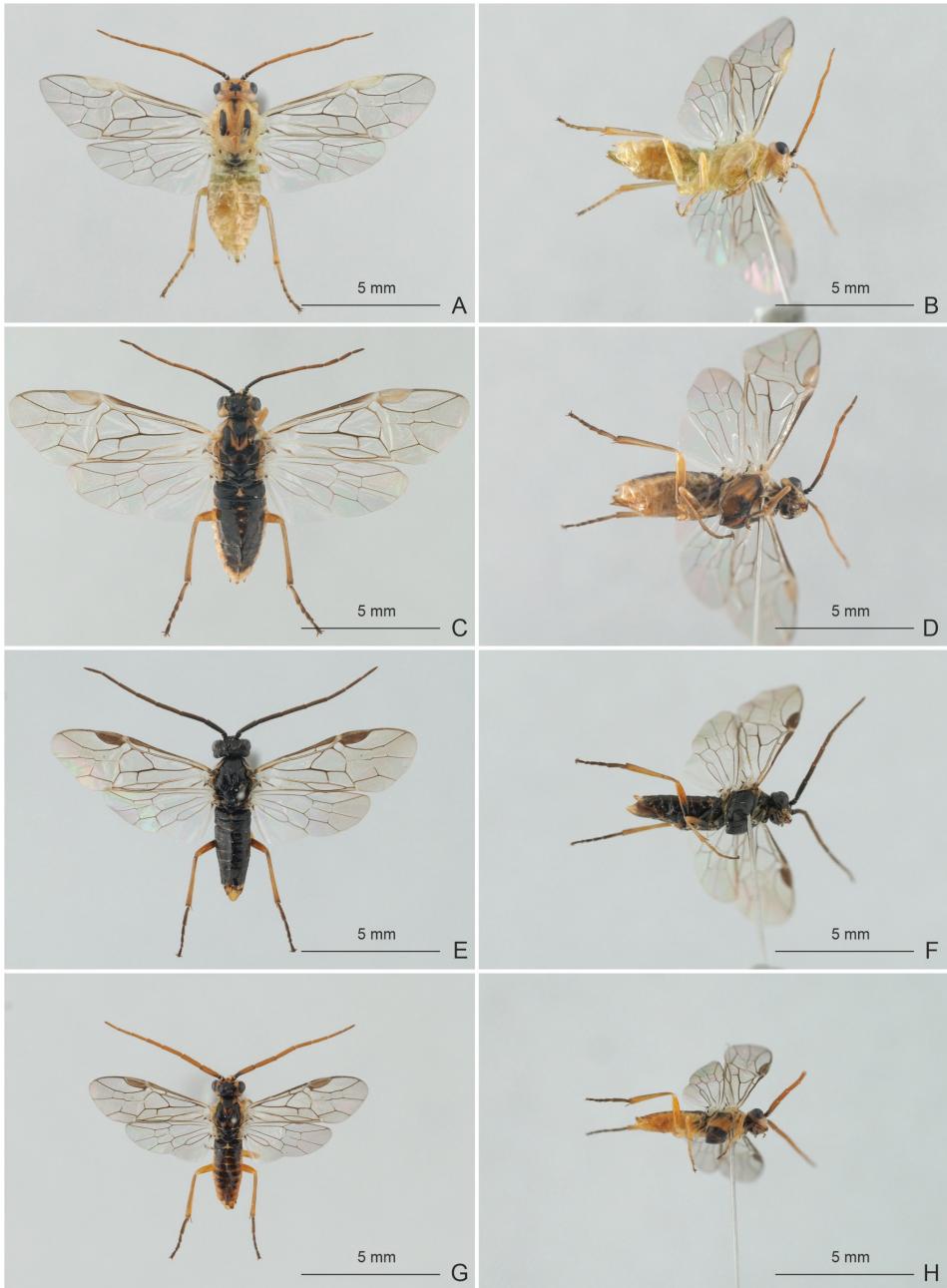


Figure 13. *Euura bergmanni* adults. Females ZMUO.040825 (**A, B**) and ZMUO.039814 (**C, D**), males ZMUO.035691 (**E, F**) and ZMUO.040823 (**G, H**).

sutures distinctly inclined apically (not inclined). Valvula 3 is also (usually) slightly narrower compared to *flavescens* group. Males distinguishable from other species by distinct penis valves.

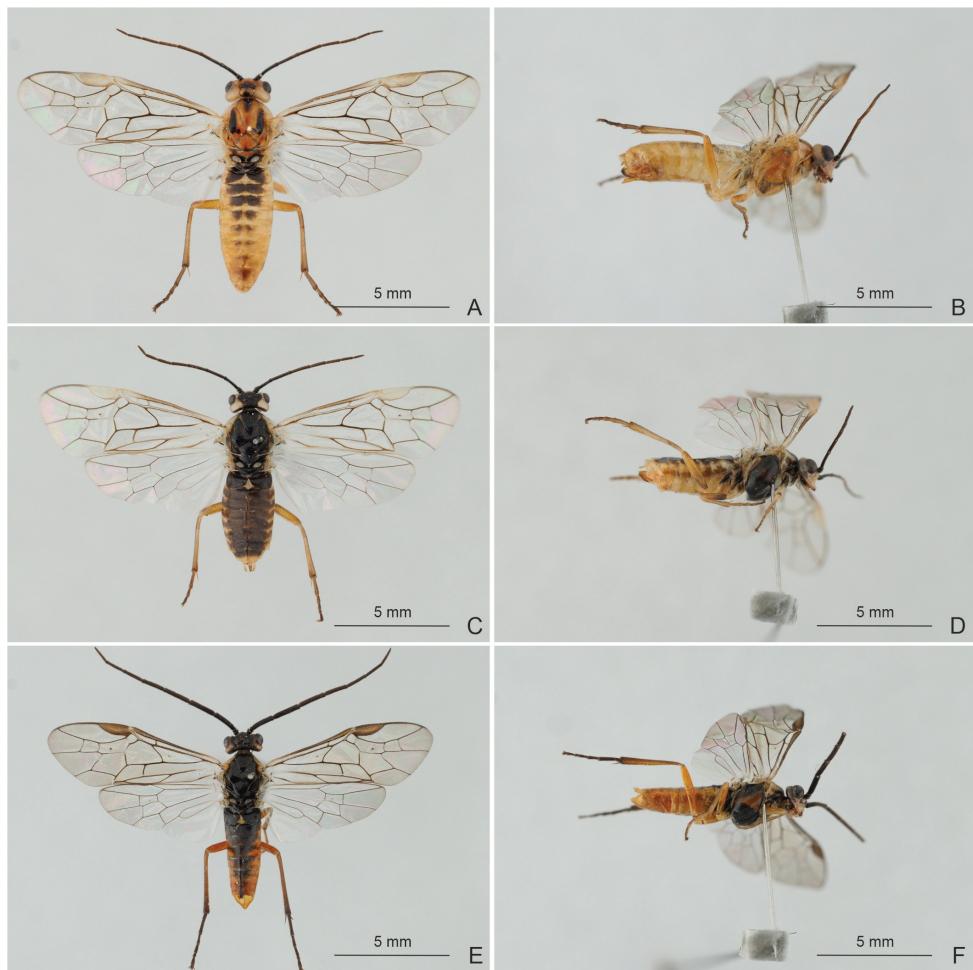


Figure 14. *Euura brevivalvis* adults. Females ZMUC.039726 (**A, B**) and ZMUC.035558 (**C, D**), male ZMUC.039090 (**E, F**).

Genetic data. COI. Based on 4 specimens, maximum within species distance is 0.76% (4.56% when including representatives from [BOLD:AAG3563](#) and [BOLD:ACY4317](#)) and the nearest neighbour, diverging by a minimum of 6.23%, is *sylvestris*. BINs: [BOLD:ADS7391](#) (Holarctic), possibly also Nearctic [BOLD:AAG3563](#) and [BOLD:ACY4317](#).

Nuclear. Based on 3 specimens, maximum within species distance is 0.07% (0.05% based on haplotypes of individual females). The nearest neighbour, diverging by a minimum of 2.96%, is *viridis*.

Host plants and behaviour. Hosts: *Salix* spec. (Lindqvist 1960b); *Salix glauca* (V. Vikberg; unpublished rearing results). Probably only one generation per year.

Distribution. West Palaearctic and Nearctic (Sundukov 2017). Mainly in subarctic and arctic areas. Specimens studied are from Finland, Norway, and Sweden.

Type material. *Nematus leptocephalus*. HT, ♀, NHRS-HEVA000003974, NHRS.

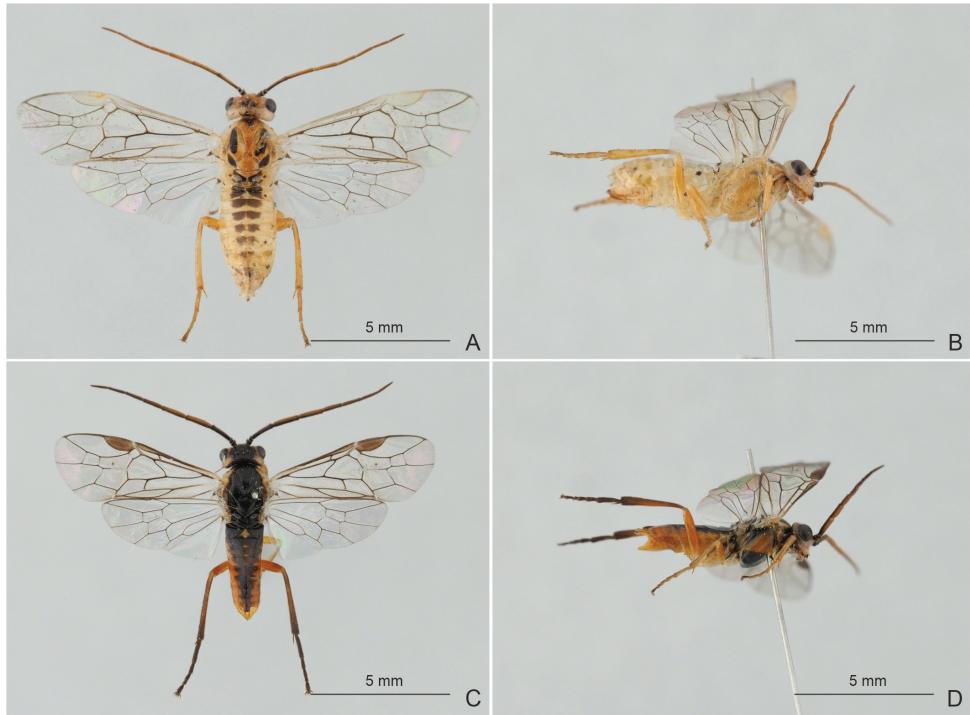


Figure 15. *Euura dispar* adults. Female ZMUO.034987 (**A, B**), male ZMUO.040517 (**C, D**). Identification of the female is uncertain.

***Euura respondens* (Förster, 1854)**

Figs 5Q, 9C, 10A, G, 11J, 18, 26D–F

Nematus respondens Förster, 1854b: 427–428. Type locality: Austria. Lectotype designated below.

Nematus nitens Thomson, 1888: 1212. Type locality: Sweden, Lund. Lectotype designated by Koch (2000). Mentioned as a synonym of *Nematus respondens* by Zhelohovtsev and Zinovjev (1995).

Pteronus balassagloei Jakowlew, 1891: 23–24. Type locality: Uzbekistan, Tashkent. Lectotype designated by Zhelohovtsev (1976). Mentioned as a synonym of *Nematus respondens* by Zhelohovtsev (1976).

Nematus declaratus Muche, 1974: 105–107. Type locality: Uzbekistan, Fergana (HT).
Syn. nov.

Nematus desantisi D.R. Smith, 1983: 260–262. Type locality: Argentina, Chubut, Valle del Rio Chubut (HT). Syn. nov.

Similar species. Females are most similar to *oligospila* group, *E. bergmanni*, and *E. sylvestris*. Head more rounded in dorsal view and lancet somewhat narrower compared to *E. bergmanni*. Ventral parts of 2nd to 4th suture of lancet are oblique and more or less straight or weakly curved apically in *E. respondens*, but weakly or distinctly curved



Figure 16. *Euura glutinosae* adults. Female DEI-GISHym11403 (**A, B**), male DEI-GISHym84096 (**C, D**).

basally in *oligospila* group and *E. sylvestris*. Males distinguishable from other species by distinct penis valves.

Genetic data. COI. Based on 10 specimens, maximum within species distance is 3.19% and the nearest neighbour, diverging by a minimum of 5.44%, is *viridis* subgroup. BIN: [BOLD:ABU8945](#).

Nuclear. Based on 3 specimens, maximum within species distance is 0.18% (0.27% based on haplotypes of individual females). The nearest neighbour, diverging by a minimum of 3.82%, is *viridis*.

Host plants and behaviour. Hosts: a large number of *Salix* species, as well as sometimes *Populus* species (Dapoto and Giganti 1994; Koch and Smith 2000). Host records from the countries where *E. respondens* has become invasive are considered to be reliable, because no similar sawflies occur there, but records from Europe should be treated with caution, because the larvae of *E. respondens* and *E. oligospila* are apparently very similar. Up to six generations per year have been recorded, in Argentina (Alderete et al. 2002).

Distribution. Palaearctic, Neotropic, Afrotropic, Australasian (Zhelochovcev 1976; Koch and Smith 2000; Taeger et al. 2006; Schmidt and Smith 2009; Caron et al. 2013, current data). Almost certainly also Nearctic and Oriental. Specimens studied

are from Argentina, Australia, Austria, Bulgaria, Czech Republic, Finland, Germany, Greece, Slovakia, Sweden, and Uzbekistan.

Type material. *Nematus respondens* Förster, 1854b. **Lectotype**, here designated, ♂, GBIF-GISHym3404, ZSM. The specimen is completely destroyed and only one badly damaged penisvalve remains. However, the shape of the penis valve of this taxon is highly characteristic.

Nematus nitens Thomson, 1888. LT, ♀, DEI-GISHym88903, MZLU.

Pteronus balassagloji Jakowlew, 1891. **Lectotype**, ♂, DEI-GISHym30223, ZIN.

Nematus declaratus Muche, 1974. HT, ♂, GBIF-GISHym2826, ZMHB.

Euura sylvestris (Cameron, 1884)

Figs 5P, S, 9D, 10K, 11F, G, 19, 25

Nematus sylvestris Cameron, 1884: 266. Type locality: not stated in original description (ST); according to Cameron (1885) “Cadder Wilderness” [Scotland, Glasgow area]. Lindqvist (1962) described the results of his studies of the original description, and by R. B. Benson of the “type”, and reinstated the name as valid.

Pteronidea straminea Lindqvist, 1958: 103. Type locality: Nurmes, Finland (HT). Syn. nov.

Pteronidea angustiserra Lindqvist, 1969: 241–242. Type locality: Mustasaari, Finland (HT). Syn. nov.

Pteronidea disparoides Lindqvist, 1969: 245. Type locality: Espoo, Finland (HT). Syn. nov.

Similar species. Females are most similar to *oligospila* group, *E. respondens*, and *E. bergmanni*, from which it differs usually by having a longer malar space. Lancet is usually narrower compared to *E. bergmanni*. Clypeus is usually less deeply emarginate compared to *oligospila* group. Ventral part of 2nd to 4th suture of lancet is weakly or distinctly curved basally in *E. sylvestris*, but oblique and more or less straight or weakly curved apically in *E. respondens*. Males distinguishable from other species by their relatively distinct penis valves.

Genetic data. COI. Based on 22 specimens, maximum within species distance is 3.68% (5.68% when including also Nearctic-only BINs) and the nearest neighbour, diverging by a minimum of 5.45%, is *viridis* subgroup. BINs: [BOLD:AAG3515](#) (Holarctic), [BOLD:AEH2646](#) (ZMUO.038944, Finland), and possibly also Nearctic [BOLD:AAU8841](#), [BOLD:ACJ5634](#), [BOLD:ACI4984](#), [BOLD:AAG3521](#), [BOLD:ACN0565](#).

Nuclear. Based on 14 specimens, maximum within species distance is 0.97% (0.83% based on haplotypes of individual females). The nearest neighbour, diverging by a minimum of 2.72%, is *viridis*.

Host plants and behaviour. Hosts: *Salix* spp. and at least occasionally *Populus tremula*. Cameron (1884) included a description of the larva of *N. sylvestris* in the

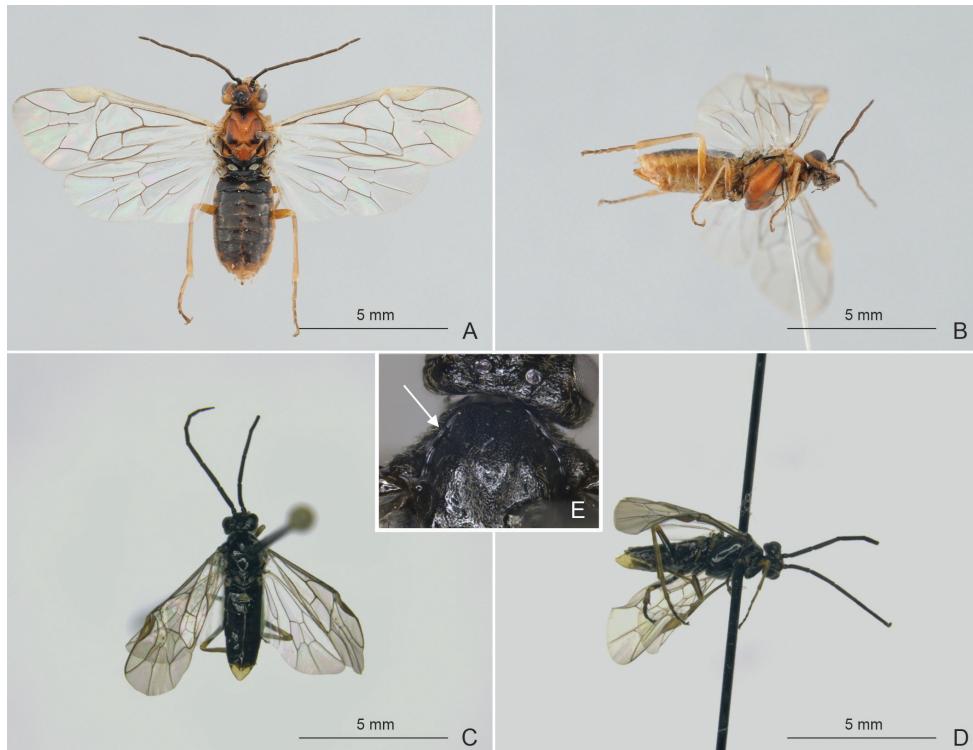


Figure 17. *Euura leptocephalus*. Female ZMUC.033448 (**A, B**), males DEI-GISHym12065 (**C, D**) and DEI-GISHym88730 (**E**).

species' description, and gave the host as *Salix caprea*. Other *Salix* species recorded as hosts are: *pentandra*, *phylicifolia* (Kangas 1985), and *myrsinifolia* (Kontuniemi 1971). We have collected or reared larvae from *S. caprea*, *S. pentandra*, *S. hegetschweileri*, *S. myrsinifolia*, and *Populus tremula*. Apparently there can be more than one generation per year (Kontuniemi 1971).

Distribution. Holarctic (Sundukov 2017, current data). Specimens studied are from Austria, Finland, Lithuania, and Sweden.

Type material. *Pteronidea straminea* Lindqvist, 1958. HT, ♀, <http://id.luomus.fi/GL.3512> (saw slide PR240.AZ lost?), MZH. Lindqvist (1972) synonymised *straminea* with *Pteronidea pallens* Konow, 1903 (see *Euura pallens*). Unfortunately, the saw of the holotype of *straminea* seems to be lost, but judging from the figure by Lindqvist (1958: 101, Fig. 15) the serrulae do not appear to be as prominent as in *E. pallens* (Fig. 7B) and seem to fit better with *E. sylvestris*, although synonymy with *E. respondens* cannot be excluded.

Pteronidea angustiserra Lindqvist, 1969. HT, ♀, <http://id.luomus.fi/GL.3443>, MZH.

Pteronidea disparoides Lindqvist, 1969. HT, ♀, <http://id.luomus.fi/GL.3493>, MZH.

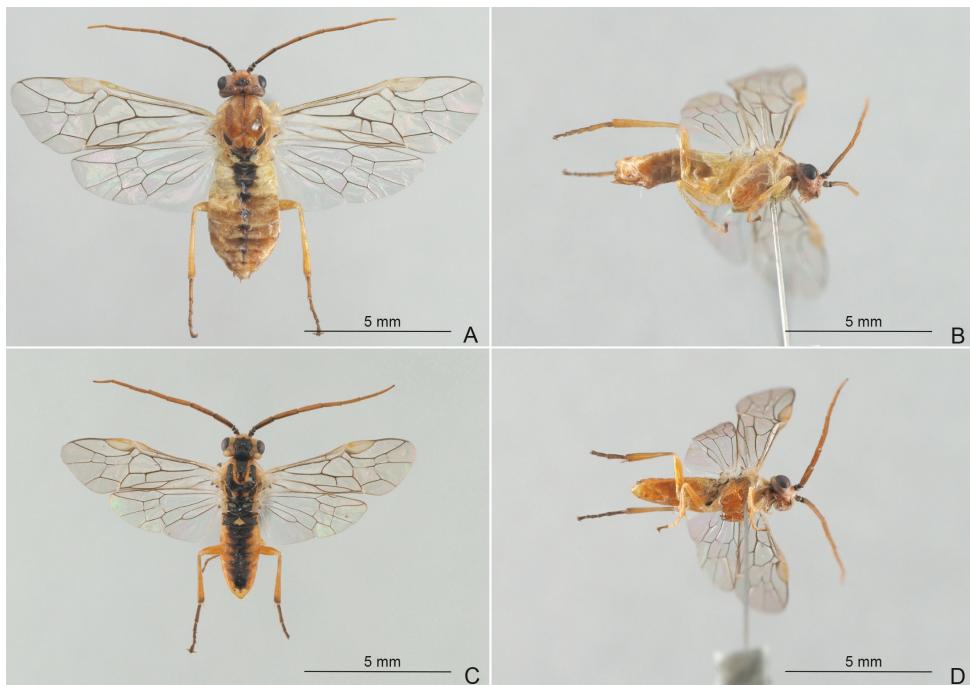


Figure 18. *Euura respondens* adults. Female ZMUC.032711 (**A, B**), male ZMUC.032712 (**C, D**).

***Euura viridis* (Stephens, 1835)**

Figs 5G, O, 8B, 10D, 11C, 20

Nematus viridis Stephens, 1835: 30. Type locality: England, London area (HT).

Nematus prasinus Hartig, 1837: 216–217. Type locality: not stated, but presumably Germany according to the title of Hartig's publication (ST). LT designated below.

Nematus polystipulus Förster, 1854a: 284, 286–288. Type locality: Germany, Aachen area (ST). LT designated below.

Pteronidea breviseta Lindqvist, 1946: 181. Type locality: Scandinavia, Lapland (ST). No identifiable syntypes were located. *Syn. nov.*

Pteronidea breviseta Lindqvist, 1949: 75–77. Type locality: Finland, Utsjoki, Outakoski (HT). *Syn. nov.*

Pteronidea abscondita Lindqvist, 1949: 77. Type locality: Finland, Kuusamo (HT) [according to original description in ZMUT, but is actually in MZH]. *Syn. nov.*

Pteronidea lauroi Lindqvist, 1960a: 35. Type locality: Finland, Ahlainen, Rankku (HT). *Syn. nov.*

Similar species. Most similar species are *E. dispar* and *E. glutinosae*. Compared to *E. dispar* it possibly has slightly smaller denticles of serrulae. Differences from *E. glutinosae* are not entirely clear. Male penis valves are most similar to *E. glutinosae*. There is possibly a smaller



Figure 19. *Euura sylvestris* adults. Female ZMUC.038944 (**A, B**), males ZMUC.035654 (**C, D**) and ZMUC.035806 (**E, F**).

gap between paravalva and valvispina compared to *E. glutinosae*. Since differences from *E. glutinosae* are not clear, the new synonymies proposed here might not be correct. Fortunately, even if the synonymies are more accurately treated under *E. glutinosae*, it would not disrupt the usage of currently valid names. The *Pteronidea abscondita* “allotype” (not a type specimen) (<http://id.luomus.fi/GL.3442>) is most likely *E. flavescens* (Stephens, 1835).

Genetic data. COI. Based on 4 specimens, maximum within species distance is 0.46% and the nearest neighbour, diverging by a minimum of 0%, are *brevivalvis*, *dispar*, and possibly *glutinosae*. BINs: BOLD:AEC8057, BOLD:ABZ5797, BOLD:ACF5540 (main cluster).

Nuclear. Based on 4 specimens, maximum within species distance is 0.09% (0.55% based on haplotypes of individual females). The nearest neighbour, diverging by a minimum of 0% (only NaK) or 0.41% (NaK and POL2), is *brevivalvis*.

Host plants and behaviour. Hosts: most host records under the name *viridis* and all those under *breviseta* refer to *Betula*, e.g. *B. pendula* (Kontuniemi 1960), *B. pubescens* (Kontuniemi 1960; Tenow 1963; Hanhimaki et al. 1995), and *Betula utilis* (Schedl 2010). However, other sources mention several additional hosts, all of which require checking, because they may involve misidentifications of the sawfly species: see also above, under *E. glutinosae*.

Distribution. Palaearctic (Sundukov 2017; current data). Specimens studied are from Finland, Germany, Sweden, and United Kingdom.

Type material. *Nematus viridis* Stephens, 1835. HT, ♀, B.M. TYPE HYM.I-697, BMNH.

Nematus prasinus Hartig, 1837. **Lectotype**, here designated, ♀, GBIF-GISHym3388, ZSM. Koch (2000) mentioned this same specimen as LT, with details of its labelling. This was not, however, a valid taxonomic act, because he omitted an explicit statement that he was designating this specimen (see ICZN 2003).

Nematus polystipus Förster, 1854. **Lectotype**, here designated, ♀, GBIF-GISHym3386, ZSM. Koch (2000) mentioned this same specimen as LT, with details of its labelling. This was not, however, a valid taxonomic act, because he omitted an explicit statement that he was designating this specimen (see ICZN 2003).

Pteronidea breviseta Lindqvist, 1946. No identifiable syntypes found: the HT of *P. breviseta* Lindqvist, 1949 was collected in 1948, and so cannot be a syntype of the taxon described in 1946.

Pteronidea breviseta Lindqvist, 1949. HT, ♀, <http://id.luomus.fi/GL.3461>, MZH.

Pteronidea abscondita Lindqvist, 1949. HT, ♀, <http://id.luomus.fi/GL.3441>, MZH.

Pteronidea lauroi Lindqvist, 1960. HT, ♀, <http://id.luomus.fi/GL.3506>, MZH.

Euura bergmanni group species outside the West Palaearctic

Euura pallens (Konow, 1903)

Pteronus pallens Konow, 1903: 310 (key). Type locality: Irkutsk, Russia (LT).

Similar species. Most similar species are *sylvestris* and *respondens*, from which it differs by having more prominent serrulae (cf. Figs 7B, 9C, D). It is possible that *pallens* is a synonym of *respondens* (shape of the basal sutures of the lancet seem to be most similar to this species), even though the serrulae seem to be more prominent than in other specimens of *bergmanni* group examined so far. Lindqvist (1972) synonymised *straminea*, which we treat as a synonym of *sylvestris*, with *pallens*. Male unknown.

Distribution. East Palaearctic. Removed from the list of West Palaearctic taxa. Specimens studied are from Russia (Irkutsk Oblast).

Type material. *Pteronus pallens* Konow, 1903. LT, here designated, ♀, GBIF-GISHym3863, SDEI.

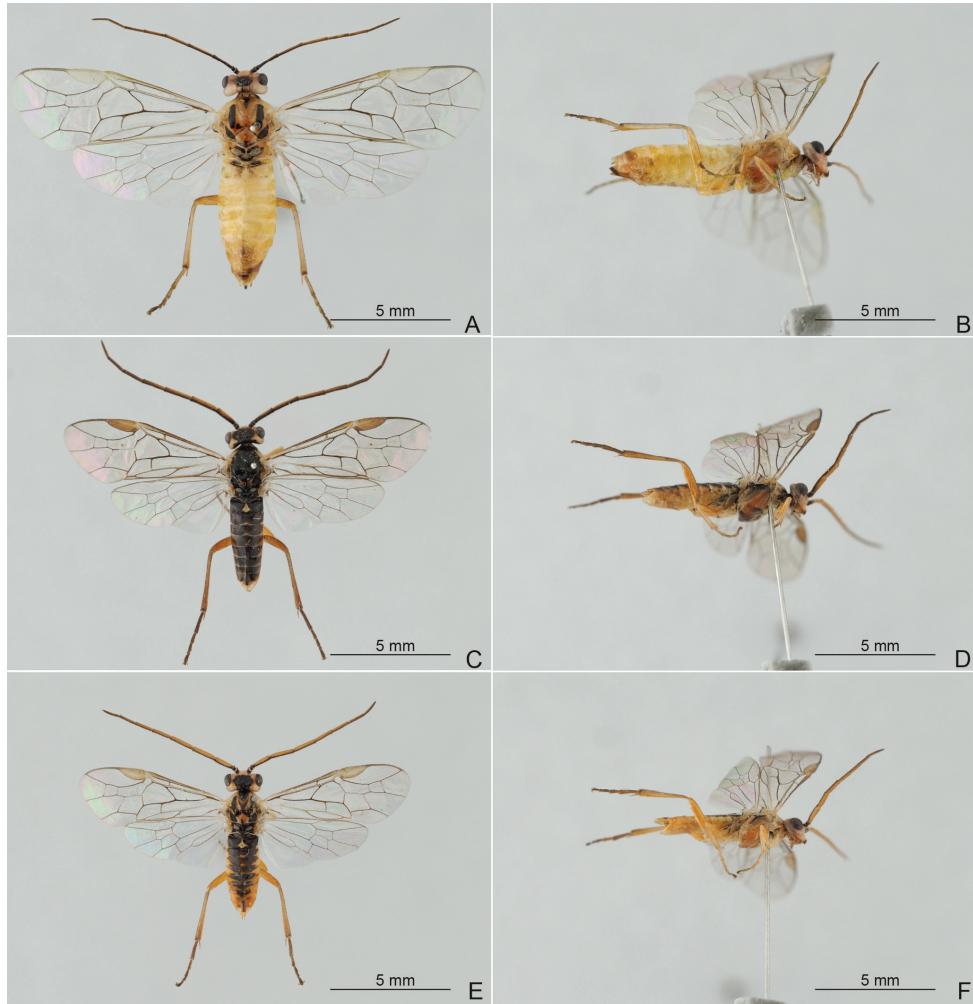


Figure 20. *Euura viridis* adults. Female ZMUC.035486 (**A, B**), males ZMUC.035650 (**C, D**) and ZMUC.035647 (**E, F**).

Euura bergmanni group, incertae sedis

Euura pyramidalis (Hellén, 1948)

Nematus (Pteronidea) pyramidalis Hellén, 1948: 114. Two ST ♀♀ not found in MZH.
Type locality: Dudinka, Krasnoyarsk Krai, Russia.

Notes. Seems to belong to the *bergmanni* rather than the *oligospila* group, because of its long malar space according to the original description (Hellén 1948). Overall colouration, small size (5.5 mm), and high northern locality (69.42°N, 86.25°E) suggests that it could be conspecific with *E. sylvestris*.

Euura oligospila group

The group is mostly defined based on phylogenetic analyses of sequence data (Fig. 1). No clear female morphological characters distinguish it from the highly similar but distantly related *bergmanni* group. Penis valves, however, enable rather easy separation of the *oligospila* group from the *bergmanni* group and the other *Euura*. The valviceps in the *oligospila* group is basally about as broad as apically, has a weak or distinct constriction in the middle, and the invagination between valvispina and paravalva is indistinct (Fig. 12A, B). Usually multiple generations per year, except probably at high latitudes and altitudes. *Salix* species are the hosts of the two European species. Larvae are cryptically coloured, solitary, and at least the later instars feed mostly from the edges of leaves. The group has a natural distribution in the Holarctic.

Euura frenalis (Thomson, 1888)

Figs 5H, 9A, 10C, 12B, 21E–H

Nematus frenalis Thomson, 1888: 1210–1212. Type locality: Sweden, Jämtland, Åreskutan. LT designated by Koch (2000).

Pteronus fastosus Konow, 1904: 262–263. Type locality: northern Russia, Kanin Peninsula. LT designated below.

Nematus (Pteronidea) fastosus var. *ponojense* Hellén, 1948: 115. Type locality: Russia, Kola Peninsula, Ponoj (ST). Lectotype designated below. Syn. nov.

Nematus (Pteronidea) fastosus var. *punctiscuta* Hellén, 1948: 115. Type locality: Finland, Kilpisjärvi. LT designated below. Syn. nov.

Similar species. See the key couplets 10 (females) and 4 (males).

Genetic data. COI. Based on 11 specimens, maximum within species distance is 6.38% and the nearest neighbour, diverging by a minimum of 0.3%, is *oligospila*. BINs: [BOLD:AEA7654](#) and [BOLD:ABZ2416](#), but possibly also Nearctic [BOLD:ACA8095](#) and [BOLD:AAV4677](#).

Nuclear. Based on 10 specimens, maximum within species distance is 0.67% (0.53% based on haplotypes of individual females). The nearest neighbour, diverging by a minimum of 0.72%, is *oligospila*.

Host plants and behaviour. Hosts: according to Kangas (1985) *Salix cinerea*, *myrsinifolia*, *pentandra*, and *phylicifolia*.

Two generations in southern Finland according to Lindqvist (1961).

Distribution. Palaearctic (Sundukov 2017, current data), but possibly also Nearctic. Mainly in the North. Specimens studied are from Finland, Norway, Russia (Murmansk Oblast, Nenets Autonomous Okrug), and Sweden.

Type material. *Nematus frenalis* Thomson, 1888. LT, ♀, DEI-GISHym88902, MZLU.

Pteronus fastosus Konow, 1904. **Lectotype**, here designated, ♀, GBIF-GISHym3851, SDEI. Koch (2000) mentioned this same specimen as LT, with details of its labelling.

This was not, however, a valid taxonomic act, because he omitted an explicit statement that he was designating this specimen (see ICZN 2003).

Nematus (Pteronidea) fastosus var. *ponojense* Hellén, 1948. **Lectotype**, here designated, ♀, <http://id.luomus.fi/GL.3546>, MZH.

Nematus (Pteronidea) fastosus var. *punctiscuta* Hellén, 1948. **Lectotype**, here designated, ♀, <http://id.luomus.fi/GL.3544>, MZH.

Euura oligospila (Förster, 1854)

Figs 5A, L, T, 9B, 10B, H, L, 12A, 21A–D, 26A–C

Nematus oligospilus Förster, 1854a: 284–286. Type locality: Germany, Aachen area. LT designated by Koch and Smith (2000).

Nematus mendicus Walsh, 1866: 261–262. Type locality: not stated (ST, probably destroyed by fire: Zinovjev and Smith 2000). Synonymised with *Nematus oligospilus* by Benson (1962).

Nematus trivittatus Norton, 1867: 218. Type locality: Canada, Mackenzie River and Great Slave Lake; USA, Illinois (ST). Synonymy with *Pteronidea mendica* by MacGillivray (1916).

Nematus microcercus Thomson, 1871: 152. Type locality: Sweden, Lund. Lectotype designated below.

Nematus dorsivittatus Cresson, 1880: 10. Type locality: USA, Nevada (ST). Synonymised with *Nematus oligospilus* by Smith (1979).

Nematus salicivorus Cameron, 1882: 194–195. Type locality: Great Britain, England, Worcestershire. Lectotype designated below.

Pteronus koebelei Marlatt, 1896: 44–46 (key), 71. Type locality: USA, California and Oregon (ST). Synonymy with *Nematus mendicus* by Ross (1951).

Pteronidea vanduzeei Rohwer, 1913: 280–281. Type locality: USA, Virginia, Chain Bridge (HT). Synonymy with *Nematus mendicus* by Ross (1951).

Pteronidea elelea MacGillivray, 1923: 162. Type locality: Canada, Alberta, Edmonton (ST). Synonymy with *Nematus mendicus* by Ross (1951).

Similar species. See the key couplets 10 (females) and 4 (males). Can be small, about 4.5 mm (ZMUC.030844).

Genetic data. COI. Based on 12 specimens, maximum within species distance is 5.93% and the nearest neighbour, diverging by a minimum of 0.3%, is *frenalis*. BINs: [BOLD:AAV4676](https://boldsystems.org/taxa/AAV4676), [BOLD:ABZ2416](https://boldsystems.org/taxa/ABZ2416), [BOLD:AEA6205](https://boldsystems.org/taxa/AEA6205), [BOLD:ABY8224](https://boldsystems.org/taxa/ABY8224) (DEI-GISHym11390), [BOLD:AEA3640](https://boldsystems.org/taxa/AEA3640) (Russian Far East), and possibly European [BOLD:ADW3220](https://boldsystems.org/taxa/ADW3220) and Nearctic [BOLD:ACA8095](https://boldsystems.org/taxa/ACA8095), [BOLD:AAV4677](https://boldsystems.org/taxa/AAV4677). [BOLD:ABW6676](https://boldsystems.org/taxa/ABW6676) is an artefact because of chimeric sequences composed of [BOLD:AEA6205](https://boldsystems.org/taxa/AEA6205) and a possible NUMT cluster. Additionally, some specimens in BOLD possibly belong to a NUMT cluster because of a stop codon and in some cases also indels: ZMUC.038942, ZMUC.035716, JSLK-S0065, ZMUC.035743, ZMUC.035642,

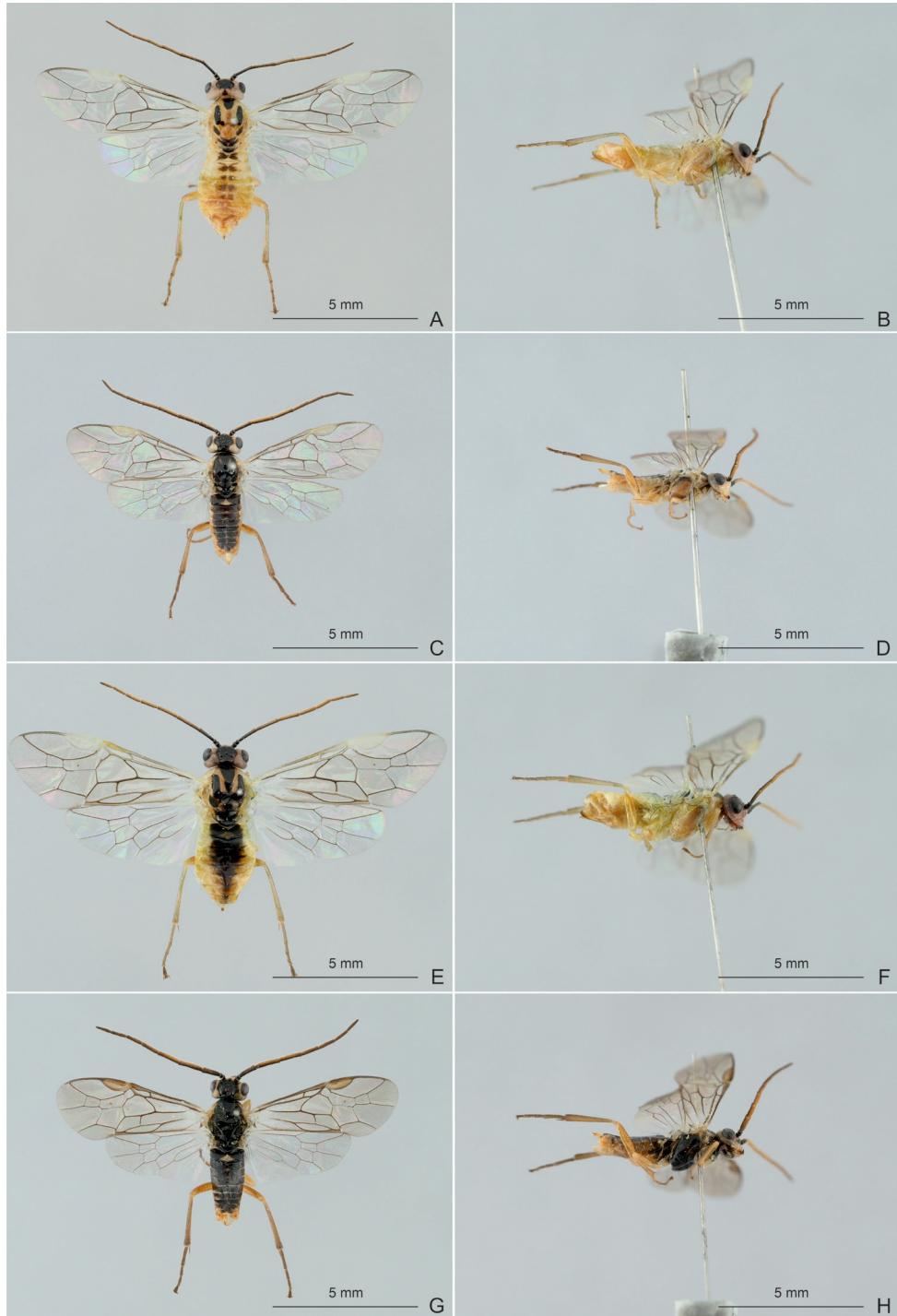


Figure 21. *Euura oligospila* (**A–D**) and *E. frenalis* (Fig. **E–H**) adults. Female ZMUO.035711 (**A, B**), male ZMUO.035743 (**C, D**), female ZMUO.035931 (**E, F**), male ZMUO.034316 (**G, H**).

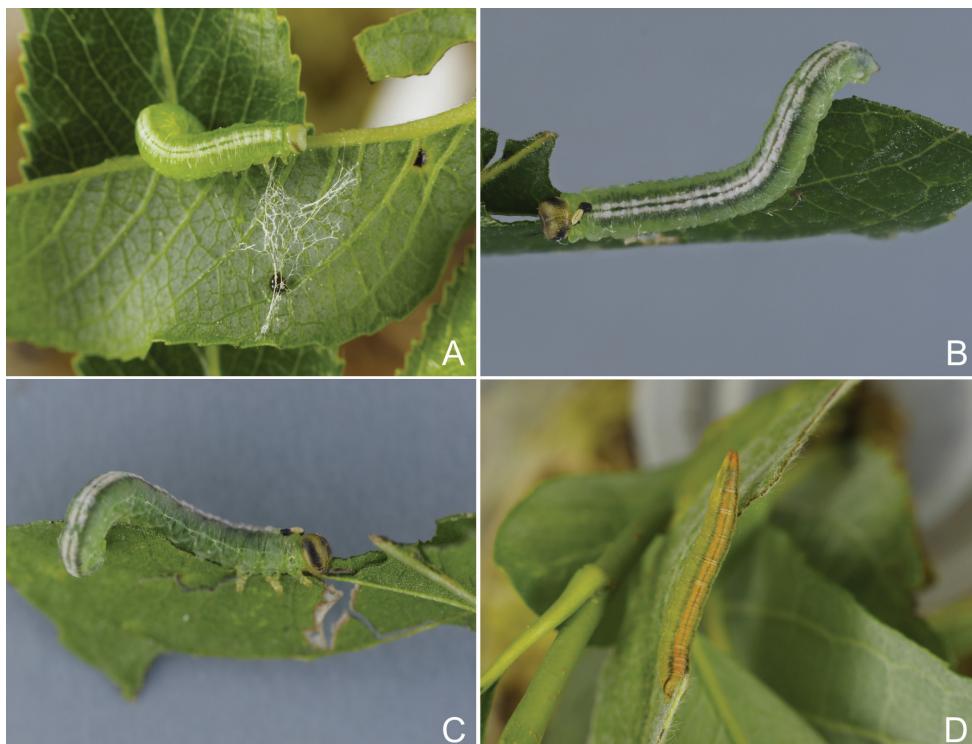


Figure 22. *Euura bergmanni* larvae. **A** Finland 2019 *Salix fragilis* **B, C** Finland 2020 *Salix* sp. **D** Finland 2019 *Salix glauca/lapporum*. Larvae of the first generation (**A–C**) are typically with white double dorsal line, while those of the later generations (**D**) are usually with pink or reddish dorsal line.

ZMUC.035689, ZMUC.031369, ZMUC.035712. Specimen ZMUC.030844 has two COI variants, one belonging to **BOLD:AEA6205** and the other one in the NUMT cluster (it has a stop codon in the barcoding region and a 1 bp insertion outside the barcoding region).

Nuclear. Based on 10 specimens, maximum within species distance is 0.68% (0.52% based on haplotypes of individual females). The nearest neighbour, diverging by a minimum of 0.72%, is *frenalis*.

Host plants and behaviour. Hosts: *Salix* species (Cameron 1882 [types of *N. salicivorus*]; Macek et al. 2020). A large number of *Salix* species, and a few species of *Populus*, are named as hosts of *oligospila* (or *oligospilus*) in the literature, but such records from Australasia, southern Africa and South America all refer to *E. respondens* (see above). Because of widespread mixing up in Europe of *E. respondens* and *E. oligospila*, it is often not clear as to which species the published records refer. Lorenz and Kraus (1957) listed *Ulmus* as a host of *oligospila*, but this is probably based on Conde (1938), whose meaning is not clear, and probably only indicates that an adult had been collected from *Ulmus*. Probably has two generations per year in southern Sweden (Benander 1966).

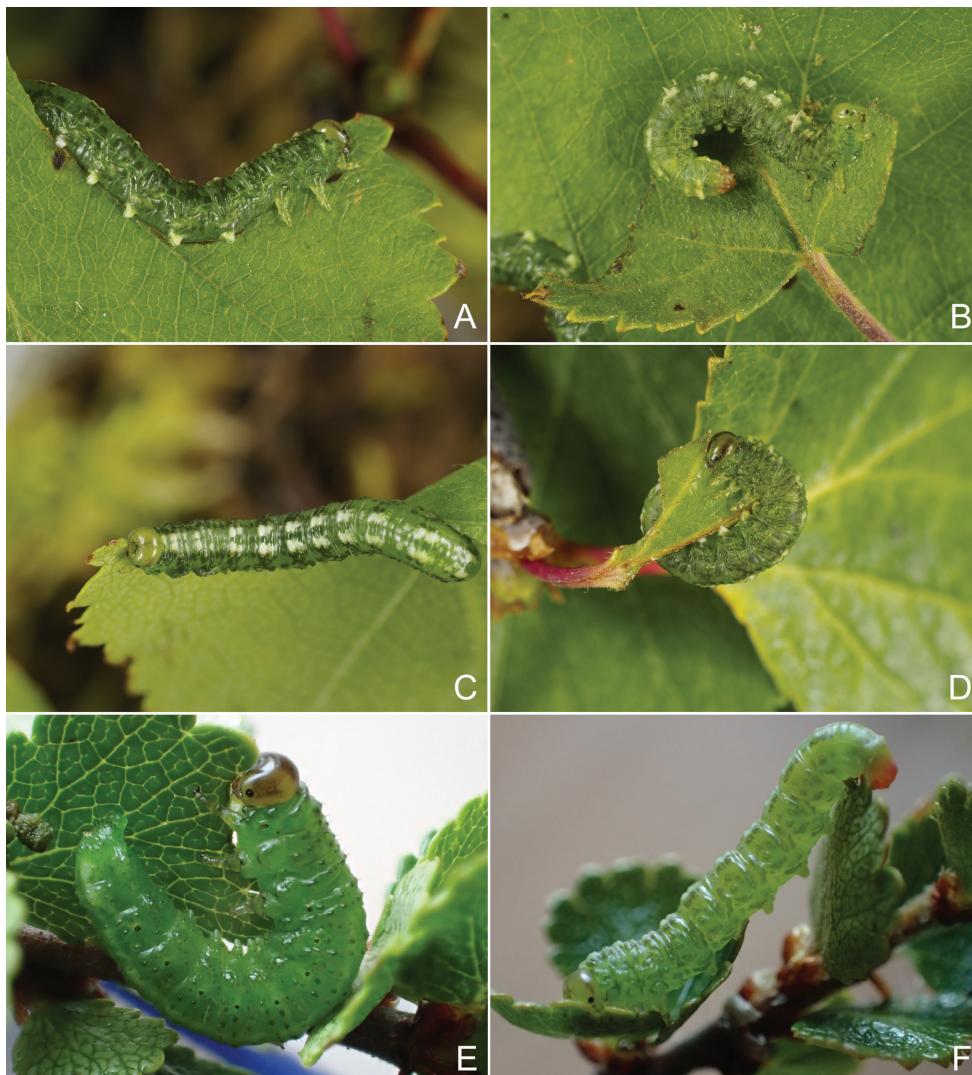


Figure 23. *Euura brevivalvis* larvae. **A–D** Finland 2019 *Betula pubescens* **E** DEI-GISHym83698 Sweden 2017 *Betula nana* **F** DEI-GISHym83696 Sweden 2017 *Betula nana*.

Distribution. West Palaearctic (see Material studied, below), East Palaearctic (Sundukov 2017) and possibly Nearctic if the synonymies given above are correct, but mentions from southern Africa, South America, Australia, and New Zealand refer to *E. respondens*. Specimens studied are from Austria, Estonia, Finland, France, Germany, Russia (Primorsky Krai), Slovakia, Sweden, United Kingdom.

Type material. *Nematus oligospilus* Förster, 1854. LT, ♀, GBIF-GISHym3372, ZSM.

Nematus microcercus Thomson, 1871. **Lectotype**, here designated, ♂, MZLU2017330, MZLU. **Paralectotypes:** 1♂, MZLU2017329. 2♀, MZLU2017327-328, det. *E. oligospila*; 1♀, MZLU2017326, det. *E. glutinosae*, MZLU.



Figure 24. *Euura glutinosae* (**A, B**) and possible *dispar* (**C–E**) larvae. **A, B** France 2007 *Alnus glutinosa* (photos: Henri Savina). **C** Pyrenees 2010 *Betula* (photo: Henri Savina). **D** Finland 2020 swept larva. **E** DEI-GISHym12579 Germany 2020 *Betula pendula*. The larvae with paired red dots (**C, D**) have earlier been considered as representing *pseudodispar* that we consider synonymous to *dispar*, but whether this type of larvae truly represent *dispar* remains unconfirmed.

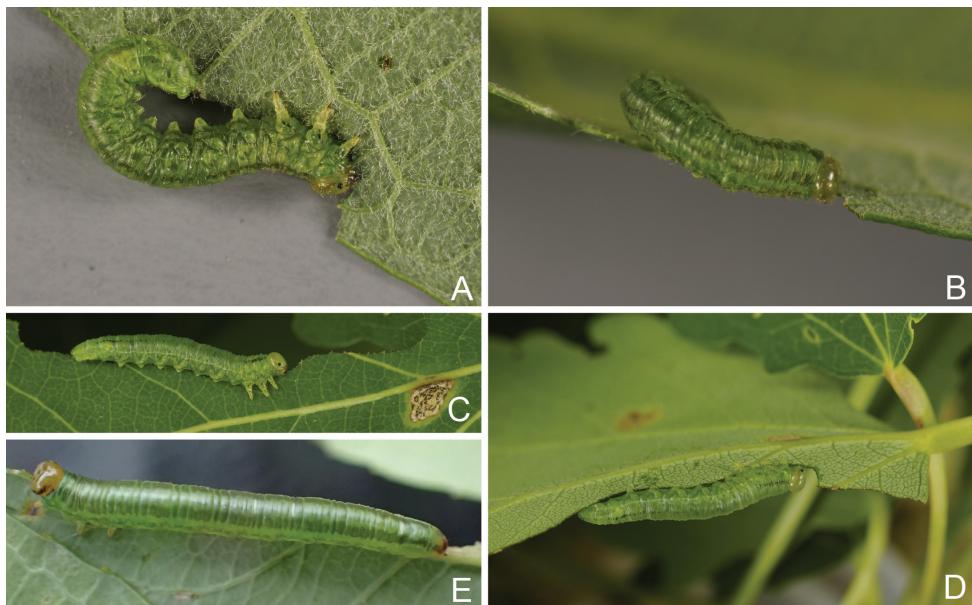


Figure 25. *Euura sylvestris* larvae. **A, B** Finland 2018 *Salix caprea*. **C, D** Finland 2019 *Populus tremula*. **E** Austria 2017 *Salix hegetschweileri*. Larvae of *sylvestris* found on *Populus tremula* in Finland in 2019 appear morphologically different from larvae on *Salix*, but based on genetics represent *sylvestris*.

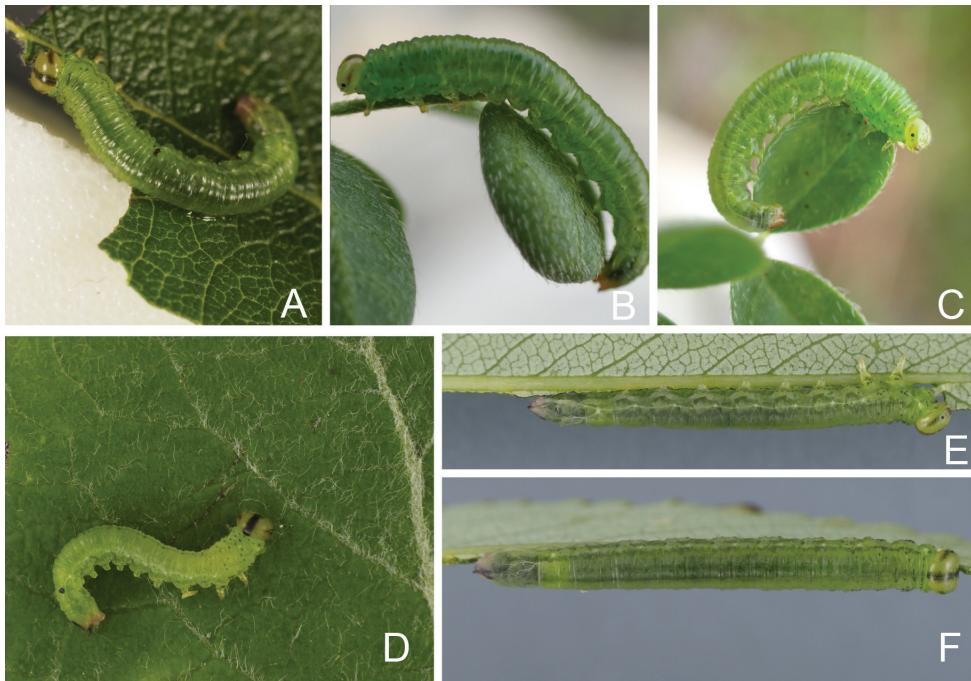


Figure 26. *Euura oligospila* (A–C) and possible *respondens* (D–F) larvae from *Salix fragilis* (unconfirmed). A Finland 2018 *Salix caprea* B, C Sweden 2018 swept larva D Finland 2020 *Salix fragilis* E, F Finland 2020 *Salix fragilis*. Larva of *respondens* remain unconfirmed but adults of this species occurred at exactly the same spot as the larva D

Nematus salicivorus Cameron, 1882. **Lectotype**, here designated, ♀, B.M.TYP*E* HYM.I.625, BMNH. “Type”, “Holotype *Nematus salicivorus* Cam ♀ det. R. B. Benson. 1938”, “*oligospila* det Benson *miliaris* det Cam”, “Cameron 96-76. Worcester”. On underside of card to which the specimen is gummed: “Bred 11.5.78; the larva X on *Salix viminalis*: Wor’sh.”

Discussion

The genus *Euura* has been taxonomically challenging and probably will remain so for years to come, but fortunately progress is also continuously being made. Here we revised the taxonomy of the *bergmanni* and *oligospila* groups, containing the bulk of the “green” *Euura*. These “green” species have been notoriously difficult to identify. In addition to very similar morphology, taxonomic oversplitting of species has further complicated identification of species in both groups. The most recent attempt to revise the “green” species was by Koch (2000), who considered only females and included fewer species than here. Unfortunately, his key (as well as all previous keys) cannot be relied upon to identify species. We hope that the keys for females and males and accompanying photographs provided here are an improvement, although identification remains difficult,

especially of females, where very few usable characters have been found and the differences are often minute, and sometimes not even definitely constant. Thanks usually to relatively clear differences in penis valves, males are easier to identify. Unfortunately, even the distinction of the males of some species is difficult (*viridis* and *glutinosae*), and potentially useful characters require confirmation by rearing or further sequencing of nuclear genes. The taxonomic decisions made here were greatly facilitated by genetic data that enabled reliable association of males and females. Although extensive rearings would have also enabled association of females and males, it can be argued that without the genetic data, the true identity of the invasive willow sawfly (*E. respondens*) might have remained undiscovered for a long time, because males are not known in the southern hemisphere populations. One other notable result is that *E. leptocephalus*, which is never green in life, belongs to the *bergmanni* group according to genetic data. This is also consistent with the structure of the saw and penis valve. Previously, only Lindqvist (1960b) had argued that *E. leptocephalus* (under the name *Pteronidea leptocephala*) is closely related to *E. bergmanni*. As in many other sawfly groups (Linnen and Farrell 2007; Prous et al. 2017, 2020; Schmidt et al. 2017), identification of species based on mitochondrial barcodes is often not reliable in the *bergmanni* and *oligospila* groups (Figs 2, 3). The most problematic in this regard is the *viridis* subgroup (*brevivalvis*, *dispar*, *viridis*, *glutinosae*) of *bergmanni* group, where probably all species can have identical COI sequences (even if >1000 bp long) while at the same time divergence within species can be around 2–3% (Fig. 2). The other species in the *bergmanni* group (*bergmanni*, *leptocephalus*, *respondens*, *sylvestris*) are all clearly distinguishable based on barcodes: as far as currently known, each species has only one or rarely two BIN clusters in Europe. In the *oligospila* group, both species are split among multiple BIN clusters, but in most cases each cluster appears to contain either *E. frenalis* or *E. oligospila*, except **BOLD:ABZ2416**, which contains both species (Fig. 3).

One issue that still needs attention is taxonomic revision of Nearctic taxa of the *oligospila* and *bergmanni* groups, which could affect the use of names for Palaearctic species.

Although morphological differences between adults of different generations have already been observed in a few species of Tenthredinoidea, such as *Pristiphora leucopus* (Hellén, 1948) (Greerson and Liston 2012), a difference in the appearance of larvae of different generations of the same species is so far only recorded for *Euura bergmanni* and *E. dispar*.

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Appendix I

List of specimens studied, available also as Suppl. material 1 excel table. The column names, separated by blank spaces, are given below. The first two fields ('C_ex' and 'GBIF.Nr') are internal specimen ID numbers in ECatSym database (<https://sdei.de/ecatsym/>). Data for the specimens is in the same order as the column names.

C_ex GBIF.Nr catalogNumber scientificName scientificNameAuthorship lifeStage Sex individualCount country stateProvince locality decimalLatitude decimalLongitude minimumElevationInMeters maximumElevationInMeters eventDateBegin eventDateEnd recordedBy samplingProtocol identifiedBy identificationUncertain typeStatus originalCombination emergenceDateBegin emergenceDateEnd associatedTaxa institutionCode GenBankAccessionCOI GenBankAccessionNaK GenBankAccessionPOL2

179082 83979 DEI-GISHym83979 *Euura abnormis* (Holmgren, 1883) adult male 1 Norway Finnmark Grense Jakobselv 8 km S 69.7, 30.8 250 m 2019-06-24 A. Liston & M. Prous netting M. Prous SDEI [MZ479442](#) [MW939716](#) [MW939831](#)

151358 84272 DEI-GISHym84272 *Euura aegra* (Konow, 1895) adult female 1 Finland Northern Ostrobothnia Juuma 2 km SE 66.261, 29.417 230 m 2018-06-10 SDEI Hym-group netting M. Prous SDEI [MZ479631](#) [MW939742](#) [MW939795](#)

152185 56635 ZMUO.030818 *Euura ampla* (Konow, 1895) adult male 1 Finland Savonia australis Lappeenranta, Kuurmanpohja [6774:3593] 61.06828, 28.73181 2017-06-19 M. Mutanen rearing M. Prous ZMUO [MZ479546](#) [MW939727](#) [MW939812](#)

158733 84060 DEI-GISHym84060 *Euura annulata* (Gimmerthal, 1834) adult male 1 Germany Thuringen Ilfeld: Netzkater: Brandesbachtal 51.6, 10.81 350 m 400 m 2019-05-30 23rd Symphyta Workshop netting M. Prous SDEI [MZ479527](#) [MW939702](#) [MW939844](#)

166267 12212 DEI-GISHym12212 *Euura anomaloptera* (Foerster, 1854) adult female 1 Norway Finnmark Skoltebyen 3 km NW 69.697, 29.31 70 m 2019-06-26 A. Liston & M. Prous netting A. D. Liston SDEI [MZ479536](#) [MW939706](#) [MW939830](#)

158186 83961 <http://id.luomus.fi/GP.110174> *Euura bergmanni* (Dahlbom, 1835) adult male 1 Finland Uusimaa Helsinki 60.17555, 24.93416 1964-01-01 1964-12-31 E. O. Peltonen rearing M. Prous *Salix pentandra* MZH

173497 108142 ZMUO.032578 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Karelia borealis: Kitee 62.0549, 30.2606 2017-05-27 Marko Mutanen ZMUO [MZ479675](#)

173503 108146 ZMUO.032583 *Euura bergmanni* (Dahlbom, 1835) adult male 1 Finland Karelia borealis: Kitee 62.0549, 30.2606 2017-05-27 Marko Mutanen M. Prous ZMUO [MZ479594](#)

173583 110299 ZMUO.034830 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Karelia borealis: Kitee: Hanttavaara 61.9648, 30.2901 2018-06-20 Marko Mutanen ZMUO

173601 110391 ZMUO.034928 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Karelia borealis: Kitee: Hanttavaara 61.9648, 30.2901 2018-06-22 Marko Mutanen ZMUO [MZ479450](#)

173692 110378 ZMUO.034915 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Karelia borealis: Kitee: Kattilavaara 61.9967, 30.3069 2018-06-20 Marko Mutanen ZMUO [MZ479660](#)

173838 108256 ZMUO.032698 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Karelia borealis: Kitee: Otravaara 61.8873, 30.1286 2017-06-07 Marko Mutanen ZMUO
174482 106508 ZMUO.030898 *Euura bergmanni* (Dahlbom, 1835) adult female 1 Finland Karelia borealis: Kitee: Papinniemi 62.0255, 29.9707 2016-07-25 Marko Mutanen M. Prous ZMUO [MZ479548](#)

174499 106684 ZMUO.031088 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Karelia borealis: Kitee: Partasensaari 62.0446, 30.2605 Marko Mutanen ZMUO

174546 106505 ZMUO.030895 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Karelia borealis: Kitee: Partasensaari 62.0459, 30.2597 2016-06-27 Marko Mutanen ZMUO [MZ479417](#)

174547 106504 ZMUO.030894 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Karelia borealis: Kitee: Partasensaari 62.0459, 30.2597 2016-06-27 Marko Mutanen ZMUO [MZ479514](#)

174604 106503 ZMUO.030893 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Karelia borealis: Kitee: Partasensaari 62.0459, 30.2597 2016-06-27 Marko Mutanen ZMUO [MZ479413](#)

174605 106502 ZMUO.030892 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Karelia borealis: Kitee: Partasensaari 62.0459, 30.2597 2016-06-27 Marko Mutanen ZMUO [MZ479595](#)

174606 106501 ZMUO.030891 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Karelia borealis: Kitee: Partasensaari 62.0459, 30.2597 2016-06-27 Marko Mutanen ZMUO [MZ479452](#)

152924 57263 ZMUO.029738 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Kiiminki 65.1098, 25.8496 2016-05-27 ZMUO [MZ479517](#)

175197 109040 ZMUO.033512 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Lapponia inarensis: Utsjoki: Ailigas 69.8773, 27.0651 2017-07-08 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479459](#)

175211 109030 ZMUO.033501 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Lapponia inarensis: Utsjoki: Ailigas 69.8773, 27.0651 2017-07-08 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479439](#)

175382 111139 ZMUO.035691 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Lapponia inarensis: Utsjoki: Boratbovccis 70.0641, 27.7223 2018-07-05 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479674](#)

175568 108954 ZMUO.033423 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Lapponia inarensis: Utsjoki: Nuorgam, Isonkivenvaara 70.0634, 27.8799 2017-07-07 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO

215668 12587 DEI-GISHym12587 *Euura bergmanni* (Dahlbom, 1835) adult female 1 Finland Lapland Leutsuvaara 68.917, 20.933 550 m 700 m 2020-06-24 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI [MZ479507](#)
[MW939689](#) [MW939799](#)

- 215669 12585 DEI-GISHym12585 *Euura bergmanni* (Dahlbom, 1835) adult female 1 Finland Lapland Leutsuvaara 68.917, 20.933 550 m 700 m 2020-06-24 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI [MZ479412](#) [MW939688](#) [MW939798](#)
- 176874 106693 ZMUO.031097 *Euura bergmanni* (Dahlbom, 1835) adult female 1 Finland Ostrobotnia ultima: Tornio: Kalkkimaan 65.9015, 24.4754 M. Prous ZMUO [MZ479602](#)
- 158184 83942 <http://id.luomus.fi/GP.110172> *Euura bergmanni* (Dahlbom, 1835) adult female 1 Finland Hame Paelkaane 61.33333, 24.26666 1959-06-01 J. Kangas rearing M. Prous *Salix phylicifolia* MZH
- 158185 83960 <http://id.luomus.fi/GP.110173> *Euura bergmanni* (Dahlbom, 1835) adult male 1 Finland Hame Paelkaane 61.33333, 24.26666 1983-06-19 J. Kangas rearing M. Prous *Salix phylicifolia* MZH
- 152760 57099 ZMUO.029701 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Partasensaari 62.019, 30.257 2016-07-25 Marko Mutanen ZMUO [MZ479499](#)
- 152762 57101 ZMUO.029704 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Partasensaari 62.019, 30.257 2016-06-27 Marko Mutanen ZMUO [MZ479400](#)
- 152800 57139 ZMUO.029683 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Partasensaari 62.019, 30.257 2016-06-27 Marko Mutanen ZMUO [MZ479550](#)
- 152827 57166 ZMUO.029682 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Partasensaari 62.019, 30.257 2016-06-27 Marko Mutanen ZMUO [MZ479645](#)
- 215667 84689 DEI-GISHym84689 *Euura bergmanni* (Dahlbom, 1835) adult male 1 Finland Lapland Pousu 68.847 21.161 450 m 2020-06-27 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI [MZ479403](#) [MW939690](#) [MW939800](#)
- 176993 107596 ZMUO.032022 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Regio aboensis: Salo: Malmberg 60.2012, 23.6004 2017-05-28 Marko Mutanen, Tomi Mutanen ZMUO [MZ479427](#)
- 177115 107246 ZMUO.031669 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Regio kuusamoensis: Kuusamo 66.061, 29.1527 2017-06-14 Marko Mutanen ZMUO [MZ479636](#)
- 177118 107243 ZMUO.031666 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Regio kuusamoensis: Kuusamo 66.061, 29.1527 2017-06-14 Marko Mutanen ZMUO [MZ479451](#)
- 177688 107033 ZMUO.031454 *Euura bergmanni* (Dahlbom, 1835) adult 1 Finland Regio kuusamoensis: Kuusamo: Pulkajaervi 66.0792, 29.1322 2017-06-12 Marko Mutanen ZMUO
- 215709 84690 DEI-GISHym84690 *Euura bergmanni* (Dahlbom, 1835) adult female 1 Finland Lapland Saarikoski 1 km N 68.814, 21.238 440 m 2020-06-26 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI [MZ479670](#) [MW939707](#) [MW939883](#)
- 50633 3451 DEI-GISHym3451 *Euura bergmanni* (Dahlbom, 1835) adult male 1 Germany Nordrhein-Westfalen Aachen 50.76666, 6.1 M. Prous lectotype *Nematus validicornis* Foerster, 1854 ZSM

- 80311 50479 BC ZSM HYM 03311 *Euura bergmanni* (Dahlbom, 1835) adult female
1 Germany Bayern Auwald 48.873, 11.102 400 m 2008-07-03 J. Hable M. Kraus &
S. Schmidt ZSM [KC975537](#)
- 80312 50480 BC ZSM HYM 03312 *Euura bergmanni* (Dahlbom, 1835) adult male
1 Germany Bayern Auwald 48.873, 11.102 400 m 2008-07-14 J. Hable M. Kraus &
S. Schmidt ZSM [HQ563876](#)
- 217191 84733 DEI-GISHym84733 *Euura bergmanni* (Dahlbom, 1835) adult female
1 Germany Sachsen-Anhalt Dessau 51.85, 12.25 60 m E. Enslin lectotype *Lygaeone-*
matus pallens Enslin, 1916 ZSM
- 217192 84734 DEI-GISHym84734 *Euura bergmanni* (Dahlbom, 1835) adult female
1 Germany Deutschland 51.5, 10.5 T. Hartig lectotype *Nematus pallicarpus* Hartig,
1837 ZSM
- 51651 3339 DEI-GISHym3339 *Euura bergmanni* (Dahlbom, 1835) adult male 1
Germany Bayern Fuerth (Fuerth i. B. [= in Bayern] in coll. Enslin) 48.481, 10.969
lectotype *Pteronidea curtispina* var. *luctuosa* Enslin, 1916 ZSM
- 49895 3456 DEI-GISHym3456 *Euura bergmanni* (Dahlbom, 1835) adult female 1
Germany Germany 51.5, 10.5 lectotype *Nematus virescens* Hartig, 1837 ZSM
- 80266 50434 BC ZSM HYM 03266 *Euura bergmanni* (Dahlbom, 1835) adult female
1 Germany Bayern Ottmaring 49.03499, 11.541 377 m 2006-06-14 J. Hable M.
Kraus & S. Schmidt ZSM
- 50618 3849 DEI-GISHym3849 *Euura bergmanni* (Dahlbom, 1835) adult male 1
Russia Irkutsk 52.33333, 104.25 lectotype *Amauronematus longicornis* Konow, 1897
SDEI
- 87284 31138 DEI-GISHym31138 *Euura bergmanni* (Dahlbom, 1835) adult female
1 Sweden Norrbottens Laen Abisko National Park, E10 68.353, 18.815 390 m 2012-
06-16 A.D. Liston, A. Taeger & S.M. Blank netting M. Prous SDEI
- 69490 20294 DEI-GISHym20294 *Euura bergmanni* (Dahlbom, 1835) adult fe-
male 1 Sweden Gotlands Laen Gotlands kommun, Roleks, border between wood
and open pasture 57.53677, 18.33787 2005-06-06 2005-07-05 SMTP - Swed-
ish Malaise Trap Project Malaise trap A. Taeger SMTP [KC974677](#) [MW939725](#)
[MW939829](#)
- 85614 20606 DEI-GISHym20606 *Euura bergmanni* (Dahlbom, 1835) adult female
1 Sweden Kopparbergs Laen Stenis 1 km N 60.947, 14.474 180 m 2013-06-15 A.D.
Liston, M. Prous & A. Taeger netting A. D. Liston SDEI [MZ479458](#)
- 155495 58933 MZLU2017334 *Euura bergmanni* (Dahlbom, 1835) adult female 1
Sweden Skane Vallby [Wallby], near Lund 55.65, 13.28333 0000-08-14 F. Koch lec-
totype *Nematus curtispina* Thomson, 1871 MZLU
- 81971 52139 BC ZSM HYM 10966 *Euura bergmanni* (Dahlbom, 1835) adult male
1 Switzerland Nidwalden Stans, Grossried 46.96699, 8.35499 443 m 2008-05-30 B.
Peter M. Kraus & S. Schmidt ZSM [KC975190](#)
- 216379 *Euura bergmanni* (Dahlbom, 1835) larva 1 United Kingdom Scotland Fife,
Loch Gelly, South shore, VC85, [NT205923](#) 56.11562, -3.28381 2020-07-26 B. Little
photography A. D. Liston *Salix* spec.

- 152815 57154 ZMUO.029670 *Euura bergmanni*_group adult female 1 Finland Haes-toe-Busoe 59.8663, 23.3399 2016-07-16 ZMUO [MZ479544](#)
- 173199 107615 ZMUO.032041 *Euura bergmanni*_group adult 1 Finland Karelia australis: Lappeenranta: Kuurmanpohja 61.0683, 28.7318 2017-05-28 Marko Mutanen ZMUO [MZ479513](#)
- 173287 108235 ZMUO.032677 *Euura bergmanni*_group adult 1 Finland Karelia borealis: Kitee 61.988, 30.0434 2017-06-07 Marko Mutanen ZMUO [MZ479418](#)
- 173693 110379 ZMUO.034916 *Euura bergmanni*_group adult 1 Finland Karelia borealis: Kitee: Kattilavaara 61.9967, 30.3069 2018-06-20 Marko Mutanen ZMUO [MZ479463](#)
- 173824 110344 ZMUO.034879 *Euura bergmanni*_group adult 1 Finland Karelia borealis: Kitee: Otravaara 61.8873, 30.1286 2018-06-19 Marko Mutanen ZMUO [MZ479576](#)
- 173907 110140 ZMUO.034666 *Euura bergmanni*_group adult 1 Finland Karelia borealis: Kitee: Otravaara 61.8873, 30.1286 2018-05-27 Marko Mutanen ZMUO [MZ479585](#)
- 173979 109587 ZMUO.034109 *Euura bergmanni*_group adult 1 Finland Karelia borealis: Kitee: Otravaara 61.8877, 30.1096 2018-05-27 Marko Mutanen ZMUO [MZ479598](#)
- 174100 109566 ZMUO.034088 *Euura bergmanni*_group adult 1 Finland Karelia borealis: Kitee: Otravaara 61.8877, 30.1096 2018-05-27 Marko Mutanen ZMUO [MZ479445](#)
- 174109 107943 ZMUO.032377 *Euura bergmanni*_group adult 1 Finland Karelia borealis: Kitee: Otravaara 61.8877, 30.1096 2017-06-06 Marko Mutanen ZMUO [MZ479609](#)
- 174153 110427 ZMUO.034965 *Euura bergmanni*_group adult 1 Finland Karelia borealis: Kitee: Otravaara 61.8877, 30.1096 2018-06-19 Marko Mutanen ZMUO [MZ479393](#)
- 174278 109795 ZMUO.034318 *Euura bergmanni*_group adult 1 Finland Karelia borealis: Kitee: Pajarinmaeki 62.0776, 30.1912 2018-05-25 Marko Mutanen ZMUO [MZ479481](#)
- 174391 108035 ZMUO.032470 *Euura bergmanni*_group adult 1 Finland Karelia borealis: Kitee: Papinniemi 62.0251, 29.9898 2017-06-07 Marko Mutanen ZMUO [MZ479648](#)
- 174507 106676 ZMUO.031080 *Euura bergmanni*_group adult 1 Finland Karelia borealis: Kitee: Partasensaari 62.0446, 30.2605 Marko Mutanen ZMUO [MZ479388](#)
- 174582 106573 ZMUO.030963 *Euura bergmanni*_group adult 1 Finland Karelia borealis: Kitee: Partasensaari 62.0459, 30.2597 2016-07-20 Marko Mutanen ZMUO [MZ479644](#)
- 174726 110449 ZMUO.034987 *Euura bergmanni*_group adult 1 Finland Karelia borealis: Kitee: Puhos 62.0801, 29.9378 2018-06-20 Marko Mutanen ZMUO [MZ479641](#)
- 174807 106636 ZMUO.031040 *Euura bergmanni*_group adult 1 Finland Karelia borealis: Kitee: Savikko 62.0761, 30.1796 Marko Mutanen ZMUO [MZ479543](#)

174810 106661 ZMUO.031065 *Euura bergmanni*_group adult 1 Finland Karelia borealis: Kitee: Savikko 62.0761, 30.1796 Marko Mutanen ZMUO [MZ479478](#)

174847 110015 ZMUO.034540 *Euura bergmanni*_group adult 1 Finland Karelia borealis: Kitee: Vanhahovi 62.1686, 29.9742 2018-05-15 Marko Mutanen ZMUO [MZ479613](#)

157367 59063 ZMUO.033968 *Euura bergmanni*_group adult male 1 Finland Kitee, Otravaara [6868:3664] 61.887, 30.129 2018-06-19 M. Mutanen M. Prous ZMUO 175110 106898 ZMUO.031311 *Euura bergmanni*_group adult 1 Finland Lapponia enontekiensis: Enontekioe: Kilpisjärvi, Saana 69.0456, 20.8554 Marko Mutanen, Tommi Nyman ZMUO [MZ479637](#)

175142 106574 ZMUO.030964 *Euura bergmanni*_group adult 1 Finland Lapponia enontekiensis: Enontekioe: Saana 69.0456, 20.8554 2016-07-12 Marko Mutanen, Nestori Mutanen ZMUO [MZ479557](#)

175182 111199 ZMUO.035751 *Euura bergmanni*_group adult 1 Finland Lapponia inarensis: Utsjoki: Ailegas 69.8773, 27.0651 2018-07-06 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479582](#)

175300 111006 ZMUO.035558 *Euura bergmanni*_group adult 1 Finland Lapponia inarensis: Utsjoki: Ailikas 69.4083, 25.9941 2018-07-03 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479495](#)

175302 110941 ZMUO.035492 *Euura bergmanni*_group adult 1 Finland Lapponia inarensis: Utsjoki: Ailikas 69.4224, 26.1081 2018-07-03 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479390](#)

175306 110935 ZMUO.035486 *Euura bergmanni*_group adult 1 Finland Lapponia inarensis: Utsjoki: Ailikas 69.4224, 26.1081 2018-07-03 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479556](#)

175307 110936 ZMUO.035487 *Euura bergmanni*_group adult 1 Finland Lapponia inarensis: Utsjoki: Ailikas 69.4224, 26.1081 2018-07-03 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479457](#)

175308 110937 ZMUO.035488 *Euura bergmanni*_group adult 1 Finland Lapponia inarensis: Utsjoki: Ailikas 69.4224, 26.1081 2018-07-03 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479540](#)

175314 110986 ZMUO.035538 *Euura bergmanni*_group adult 1 Finland Lapponia inarensis: Utsjoki: Ailikas 69.4224, 26.1081 2018-07-03 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479596](#)

175315 110942 ZMUO.035493 *Euura bergmanni*_group adult 1 Finland Lapponia inarensis: Utsjoki: Ailikas 69.4224, 26.1081 2018-07-03 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479652](#)

175342 110985 ZMUO.035537 *Euura bergmanni*_group adult 1 Finland Lapponia inarensis: Utsjoki: Ailikas 69.4224, 26.1081 2018-07-03 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479402](#)

175478 108814 ZMUO.033272 *Euura bergmanni*_group adult 1 Finland Lapponia inarensis: Utsjoki: Karigasniemi, Ailgas 69.4173, 25.9937 2017-07-09 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479626](#)

- 175481 108811 ZMUO.033269 *Euura bergmanni_group* adult 1 Finland Lapponia inarensis: Utsjoki: Karigasniemi, Ailigas 69.4173, 25.9937 2017-07-09 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479558](#)
- 175485 108812 ZMUO.033270 *Euura bergmanni_group* adult 1 Finland Lapponia inarensis: Utsjoki: Karigasniemi, Ailigas 69.4173, 25.9937 2017-07-09 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479444](#)
- 175486 108813 ZMUO.033271 *Euura bergmanni_group* adult 1 Finland Lapponia inarensis: Utsjoki: Karigasniemi, Ailigas 69.4173, 25.9937 2017-07-09 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479504](#)
- 175585 108965 ZMUO.033436 *Euura bergmanni_group* adult 1 Finland Lapponia inarensis: Utsjoki: Nuorgam, Isonkivenvaara 70.0634, 27.8799 2017-07-08 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479443](#)
- 175686 111123 ZMUO.035675 *Euura bergmanni_group* adult 1 Finland Lapponia inarensis: Utsjoki: Rovisuvanto 69.4703, 25.8635 2018-07-04 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479435](#)
- 175691 111084 ZMUO.035636 *Euura bergmanni_group* adult 1 Finland Lapponia inarensis: Utsjoki: Rovisuvanto 69.4703, 25.8635 2018-07-04 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479586](#)
- 175692 111085 ZMUO.035637 *Euura bergmanni_group* adult 1 Finland Lapponia inarensis: Utsjoki: Rovisuvanto 69.4703, 25.8635 2018-07-04 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479630](#)
- 175701 111083 ZMUO.035635 *Euura bergmanni_group* adult 1 Finland Lapponia inarensis: Utsjoki: Rovisuvanto 69.4703, 25.8635 2018-07-04 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479570](#)
- 175718 111098 ZMUO.035650 *Euura bergmanni_group* adult 1 Finland Lapponia inarensis: Utsjoki: Rovisuvanto 69.4703, 25.8635 2018-07-04 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479431](#)
- 175722 111095 ZMUO.035647 *Euura bergmanni_group* adult 1 Finland Lapponia inarensis: Utsjoki: Rovisuvanto 69.4703, 25.8635 2018-07-04 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479520](#)
- 175724 111103 ZMUO.035655 *Euura bergmanni_group* adult 1 Finland Lapponia inarensis: Utsjoki: Rovisuvanto 69.4703, 25.8635 2018-07-04 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479618](#)
- 175726 111104 ZMUO.035656 *Euura bergmanni_group* adult 1 Finland Lapponia inarensis: Utsjoki: Rovisuvanto 69.4703, 25.8635 2018-07-04 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479563](#)
- 175735 111633 ZMUO.036281 *Euura bergmanni_group* adult 1 Finland Lapponia inarensis: Utsjoki: Tenojoki 69.9583, 26.6894 ZMUO [MZ479515](#)
- 175802 108722 ZMUO.033175 *Euura bergmanni_group* adult 1 Finland Lapponia sompiensis: Sodankylae: Ylisenvaara 68.2188, 27.2052 2017-07-04 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479573](#)
- 175804 108724 ZMUO.033177 *Euura bergmanni_group* adult 1 Finland Lapponia sompiensis: Sodankylae: Ylisenvaara 68.2188, 27.2052 2017-07-04 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO [MZ479669](#)

- 175948 106789 ZMUO.031195 *Euura bergmanni*_group adult 1 Finland Ostrobotnia ouluensis: Kiiminki 65.11, 25.8836 Marko Mutanen, Sylvia Mutanen ZMUO [MZ479555](#)
- 175949 106790 ZMUO.031196 *Euura bergmanni*_group adult 1 Finland Ostrobotnia ouluensis: Kiiminki 65.11, 25.8836 Marko Mutanen, Sylvia Mutanen ZMUO [MZ479633](#)
- 176049 106801 ZMUO.031208 *Euura bergmanni*_group adult 1 Finland Ostrobotnia ouluensis: Kiiminki 65.1446, 25.831 Marko Mutanen ZMUO [MZ479467](#)
- 176050 106802 ZMUO.031209 *Euura bergmanni*_group adult 1 Finland Ostrobotnia ouluensis: Kiiminki 65.1446, 25.831 Marko Mutanen ZMUO [MZ479434](#)
- 176051 106803 ZMUO.031210 *Euura bergmanni*_group adult 1 Finland Ostrobotnia ouluensis: Kiiminki 65.1446, 25.831 Marko Mutanen ZMUO [MZ479571](#)
- 176545 111424 ZMUO.035980 *Euura bergmanni*_group adult 1 Finland Ostrobotnia ouluensis: Oulu: Kiiminki 65.139, 25.86 2018-06-24 Marko Mutanen ZMUO [MZ479411](#)
- 151655 56560 Prep.143.OR *Euura bergmanni*_group adult female 1 Finland Hame Paelkaene 61.33333, 24.26666 1959-06-17 M. Prous CVV
- 176878 106856 ZMUO.031269 *Euura bergmanni*_group adult 1 Finland Regio aboensis: Kaarina: Jaervelae 60.4604, 22.3787 2017-06-03 ZMUO [MZ479508](#)
- 177842 107174 ZMUO.031596 *Euura bergmanni*_group adult 1 Finland Regio kuusamoensis: Kuusamo: Reposuo 66.09, 29.321 2017-06-14 Marko Mutanen ZMUO [MZ479640](#)
- 178135 111626 ZMUO.036274 *Euura bergmanni*_group adult 1 Finland Tavastia australis: Paelkaene: Uutana 61.3176, 24.2593 2018-06-02 ZMUO [MZ479603](#)
- 83913 54081 BC ZSM HYM 16652 *Euura bergmanni*_group adult female 1 Germany Brandenburg 40 km SE Berlin 52.24, 13.8 34 m 2008-06-10 C. Schmid-Egger M. Kraus & S. Schmidt ZSM
- 83700 53868 BC ZSM HYM 16439 *Euura bergmanni*_group adult female 1 Germany Bayern am oberen Kirchenbach, 1.2 km W Sollngriesbach 49.1776, 11.41339 546 m 2012-05-22 J. Hable M. Kraus & S. Schmidt ZSM
- 158810 12119 DEI-GISHym12119 *Euura bergmanni*_group adult male 1 Germany Thueringen Ilfeld: Netzkater: Brandesbachtal 51.6, 10.81 350 m 400 m 2019-05-31 23rd Symphyta Workshop netting M. Prous SDEI
- 80305 50473 BC ZSM HYM 03305 *Euura bergmanni*_group adult female 1 Germany Bayern Mittelbueg bei Nuernberg 49.48009, 11.217 316 m 1991-06-09 M. Kraus M. Kraus & S. Schmidt ZSM [KC974928](#)
- 215430 84564 DEI-GISHym84564 *Euura bergmanni*_group adult male 1 Germany Brandenburg Muencheberg W, NSG Gumnitz 52.51183, 14.08223 2020-05-21 A. Liston & M. Prous netting M. Prous & A. Liston SDEI
- 83909 54077 BC ZSM HYM 16648 *Euura bergmanni*_group adult female 1 Germany Bayern Waldsaum Kerkhofen/ Oberndorf 49.17359, 11.38669 460 m 2012-05-04 J. Hable M. Kraus & S. Schmidt ZSM
- 80945 51113 BC ZSM HYM 06422 *Euura bergmanni*_group adult female 1 Poland Bialowieza 52.66666, 23.83333 2002-06-15 M. Kraus & S. Schmidt ZSM [KC975946](#)
- 80946 51114 BC ZSM HYM 06423 *Euura bergmanni*_group adult female 1 Poland Bialowieza 52.66666, 23.83333 2003-07-05 M. Kraus & S. Schmidt ZSM [KC973061](#)

- 80947 51115 BC ZSM HYM 06424 *Euura bergmanni*_group adult female 1 Poland Bialowieza 52.66666, 23.83333 2003-07-05 M. Kraus & S. Schmidt ZSM [KC974944](#)
- 87287 31141 DEI-GISHym31141 *Euura bergmanni*_group adult female 1 Sweden Norrbottens Laen Abisko National Park, E10 68.353, 18.815 390 m 2012-06-18 A.D. Liston, A. Taeger & S.M. Blank netting M. Prous SDEI
- 96685 31696 DEI-GISHym31696 *Euura bigallae* (Vikberg & Zinovjev, 2014) larva 1 Sweden Vaesterbotten, Norsjoe 5 km NNW 64.95492, 19.43269 2016-06-20 A.D. Liston photography A. D. Liston *Salix caprea* SDEI [MK624678](#) [MK624766](#) [MK624825](#)
- 94430 80206 DEI-GISHym80206 *Euura bohemani* (Thomson, 1871) adult male 1 Sweden Torne Lappmark Bjoerkilden 68.409, 18.639 500 m 600 m 2016-07-09 A. Liston & M. Prous netting M. Prous SDEI [KY698139](#) [KY698264](#) [MK624829](#)
- 151183 84190 DEI-GISHym84190 *Euura brevivalvis* (Thomson, 1871) adult female 1 Estonia Raplamaa Kastna 1 km N 58.863, 25.052 70 m 2018-05-22 M. Prous netting M. Prous SDEI [MZ479398](#) [MW939677](#) [MW939790](#)
- 68090 11621 DEI-GISHym11621 *Euura brevivalvis* (Thomson, 1871) adult female 1 Finland Lapin Laeaeni Kevo 69.75, 27.01666 2001-06-09 2001-06-11 Kevo Subarctic Research Institute rearing A. D. Liston SDEI [KC976421](#)
- 68093 11624 DEI-GISHym11624 *Euura brevivalvis* (Thomson, 1871) adult male 1 Finland Lapin Laeaeni Kevo 69.75, 27.01666 2001-06-09 2001-06-11 Kevo Subarctic Research Institute rearing A. D. Liston SDEI [KC976363](#)
- 75105 17593 DEI-GISHym17593 *Euura brevivalvis* (Thomson, 1871) adult male 1 Finland Lapin Laeaeni Kevo 69.75, 27.01666 2001-06-09 2001-06-11 Kevo Subarctic Research Institute rearing A. Taeger SDEI
- 75106 17594 DEI-GISHym17594 *Euura brevivalvis* (Thomson, 1871) adult male 1 Finland Lapin Laeaeni Kevo 69.75, 27.01666 2001-06-09 2001-06-11 Kevo Subarctic Research Institute rearing A. Taeger SDEI
- 68809 56573 <http://id.luomus.fi/GL.9217> *Euura brevivalvis* (Thomson, 1871) adult female 1 Finland Lapin Laeaeni Kilpisjäervi 69.05, 20.8 1968-07-09 L. H. Woollatt holotype *Pteronidea woollatti* Lindqvist, 1971 MZH
- 215462 84593 DEI-GISHym84593 *Euura brevivalvis* (Thomson, 1871) adult male 1 Finland Lapland Kilpisjäervi, Jehkas 69.086, 20.8 550 m 950 m 2020-06-28 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI
- 215672 84520 DEI-GISHym84520 *Euura brevivalvis* (Thomson, 1871) adult male 1 Finland Lapland Kilpisjäervi, Jehkas 69.086, 20.8 550 m 950 m 2020-06-28 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI
- 215673 *Euura brevivalvis* (Thomson, 1871) adult 17 Finland Lapland Kilpisjäervi, Jehkas 69.086, 20.8 550 m 950 m 2020-06-28 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI
- 215555 84654 DEI-GISHym84654 *Euura brevivalvis* (Thomson, 1871) adult male 1 Finland Lapland Kilpisjäervi, Malla 69.065, 20.722 500 m 850 m 2020-06-25 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI

215679 *Euura brevivalvis* (Thomson, 1871) adult 9 Finland Lapland Kilpisjäervi, Malla 69.065, 20.722 500 m 850 m 2020-06-25 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI

215674 *Euura brevivalvis* (Thomson, 1871) adult female 1 Finland Lapland Kilpisjäervi, Saana 69.037, 20.844 500 m 900 m 2020-06-29 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI

215493 84633 DEI-GISHym84633 *Euura brevivalvis* (Thomson, 1871) adult male 2 Finland Lapland Leutsuvaara 68.917, 20.933 550 m 700 m 2020-06-27 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI

215675 84494 DEI-GISHym84494 *Euura brevivalvis* (Thomson, 1871) adult male 1 Finland Lapland Leutsuvaara 68.917, 20.933 550 m 700 m 2020-06-27 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI

215676 *Euura brevivalvis* (Thomson, 1871) adult 5 Finland Lapland Leutsuvaara 68.917, 20.933 550 m 700 m 2020-06-27 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI

215677 *Euura brevivalvis* (Thomson, 1871) adult 4 Finland Lapland Leutsuvaara 68.917, 20.933 550 m 700 m 2020-06-24 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI

152532 56871 ZMUC.028381 *Euura brevivalvis* (Thomson, 1871) adult female 1 Finland Muonio 67.8909, 23.7503 2014-07-01 Marko Mutanen M. Prous ? ZMUC
MZ479592

151400 84227 DEI-GISHym84227 *Euura brevivalvis* (Thomson, 1871) adult male 1 Finland Northern Ostrobothnia Oulanka station 5 km E 66.38, 29.426 230 m 2018-06-02 A. Liston & M. Prous netting M. Prous SDEI **MZ479395 MW939741 MW939805**

64908 58962 <http://id.luomus.fi/GL.3465> *Euura brevivalvis* (Thomson, 1871) adult female 1 Finland Pihtipudas 63.38333, 25.56666 1946-06-08 1946-06-09 E. Lindqvist M. Prous holotype Pteronidea absimilis Lindqvist, 1949 MZH

215678 *Euura brevivalvis* (Thomson, 1871) adult female 1 Finland Lapland Pousu 68.847, 21.161 450 m 2020-06-27 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI

151399 84214 DEI-GISHym84214 *Euura brevivalvis* (Thomson, 1871) adult female 1 Finland Northern Ostrobothnia Pudasjäervi 18 km E 65.409, 27.371 130 m 2018-06-01 A. Liston & M. Prous netting M. Prous SDEI **MZ479510 MW939679 MW939792**

151295 56524 PR.586VV *Euura brevivalvis* (Thomson, 1871) adult female 1 Finland Lapin Laeaeni Utsjoki 69.88333 27 1960-06-08 V. Vikberg V. Vikberg CVV

151296 56525 PR.587VV *Euura brevivalvis* (Thomson, 1871) adult female 1 Finland Lapin Laeaeni Utsjoki 69.88333 27 1960-06-07 V. Vikberg V. Vikberg CVV

157334 59032 ZMUC.030869 *Euura brevivalvis* (Thomson, 1871) adult female 1 Finland Lapponia inarensis Utsjoki, Nuorgam, Isonkivenvaara [7776:3533] 70.06338, 27.87993 2017-07-08 M. Mutanen, N. Mutanen, A. Mutanen M. Prous ZMUC
MZ479566 MW939735 MW939832

- 157335 59033 ZMUO.030870 *Euura brevivalvis* (Thomson, 1871) adult male 1 Finland Lapponia inarensis Utsjoki, Nuorgam, Isonkivenvaara [7776:3533] 70.06338, 27.87993 2017-07-08 M. Mutanen, N. Mutanen, A. Mutanen M. Prous ZMUO [MZ479666](#) [MW939736](#) [MW939833](#)
- 152507 56846 ZMUO.028316 *Euura brevivalvis* (Thomson, 1871) adult female 1 Finland Viiankiaapa, Kotavaara 67.5872, 26.8367 2015-06-08 M. Prous ? ZMUO [MZ479401](#)
- 67818 11380 DEI-GISHym11380 *Euura brevivalvis* (Thomson, 1871) adult female 1 France Aulus-les-Bains 42.8, 1.33333 2011-05-05 H. Savina M. Prous SDEI [KC976917](#) [MW939719](#) [MW939819](#)
- 51848 3847 DEI-GISHym3847 *Euura brevivalvis* (Thomson, 1871) adult female 1 Germany Saxony-Anhalt Dornreichenbach 51.36666, 12.86666 1894-05-06 G. Enderlein lectotype *Pteronus kriegeri* Konow, 1903 SDEI
- 216303 *Euura brevivalvis* (Thomson, 1871) adult 2 Norway Finnmark Grense Jakobselv 8 km S 69.7, 30.8 250 m 2019-06-24 A. Liston & M. Prous netting M. Prous SDEI
- 50628 3848 DEI-GISHym3848 *Euura brevivalvis* (Thomson, 1871) adult female 1 Russia Russia bor. lectotype *Amauronematus spurcus* Konow, 1904 SDEI
- 87281 31135 DEI-GISHym31135 *Euura brevivalvis* (Thomson, 1871) adult female 1 Sweden Norrbottens Laen Abisko 9 km E (Stordalen) 68.35, 19.035 400 m 2012-06-17 A.D. Liston, A. Taeger & S.M. Blank netting M. Prous SDEI [MZ479584](#)
- 146782 83696 DEI-GISHym83696 *Euura brevivalvis* (Thomson, 1871) larva 1 Sweden Norrbottens Laen Abisko 9 km E (Stordalen) 68.35, 19.035 400 m 2017-08-05 A. Liston & M. Prous M. Prous *Betula nana* SDEI [MZ479456](#) [MW939674](#)
- 146785 83698 DEI-GISHym83698 *Euura brevivalvis* (Thomson, 1871) larva 1 Sweden Norrbottens Laen Abisko 9 km E (Stordalen) 68.35, 19.035 400 m 2017-08-05 A. Liston & M. Prous M. Prous *Betula nana* SDEI [MZ479469](#) [MW939675](#)
- 96482 21375 DEI-GISHym21375 *Euura brevivalvis* (Thomson, 1871) adult female 1 Sweden Torne Lappmark Abisko: Mt. Njulla 68.362, 18.73 400 m 950 m 2016-06-30 A. Liston & M. Prous netting M. Prous SDEI [MZ479663](#) [MW939750](#) [MW939858](#)
- 96486 21378 DEI-GISHym21378 *Euura brevivalvis* (Thomson, 1871) adult female 1 Sweden Torne Lappmark Abisko: Mt. Njulla 68.362, 18.73 400 m 950 m 2016-06-30 A. Liston & M. Prous netting M. Prous SDEI [MZ479579](#) [MW939751](#) [MW939869](#)
- 155522 88904 DEI-GISHym88904 *Euura brevivalvis* (Thomson, 1871) adult female 1 Sweden Kopparbergs Laen Dalarna alpina C. H. Boheman M. Prous lectotype *Nematus brevivalvis* Thomson, 1871 MZLU
- 87381 *Euura brevivalvis* (Thomson, 1871) adult female 1 Sweden Norrbottens Laen Kaunisvaara 2 km N 67.4, 23.345 170 m 2014-06-07 A. Liston & M. Prous netting A. D. Liston SDEI
- 87283 31137 DEI-GISHym31137 *Euura brevivalvis* (Thomson, 1871) adult female 1 Sweden Norrbottens Laen Kiruna nr. airport 67.84, 20.35 450 m 2012-06-21 A.D. Liston, A. Taeger & S.M. Blank netting M. Prous SDEI [MZ479622](#)
- 87382 *Euura brevivalvis* (Thomson, 1871) adult female 2 Sweden Norrbottens Laen Muodoslompolo 10 km SW 67.894, 23.232 270 m 2014-06-13 A. Liston & M. Prous netting A. D. Liston SDEI

- 87378 *Euura brevivalvis* (Thomson, 1871) adult female 1 Sweden Norrbottens Laen Oeverkalix 22 km W 66.295, 22.356 140 m 2014-06-02 A. Liston & M. Prous netting A. D. Liston SDEI
- 87379 *Euura brevivalvis* (Thomson, 1871) adult female 2 Sweden Norrbottens Laen Oeverkalix 22 km W 66.295, 22.356 140 m 2014-06-04 A. Liston & M. Prous netting A. D. Liston SDEI
- 87380 *Euura brevivalvis* (Thomson, 1871) adult female 4 Sweden Norrbottens Laen Pa-jala 67.204, 23.409 150 m 2014-06-05 A. Liston & M. Prous netting A. D. Liston SDEI 150906 84184 DEI-GISHym84184 *Euura clibrichella* (Cameron, 1878) adult male 1 Sweden Torne Lappmark Bjoerkilden 68.409, 18.639 500 m 850 m 2016-07-01 A. Liston & M. Prous netting M. Prous SDEI [MK624670](#) [MK624760](#) [MK624813](#)
- 63033 *Euura dispar* (Zaddach, 1876) larva 1 Europe Pyrenaeen 42.5 2 2010-07-24 H. Savina photography H. Savina *Betula* spec.
- 152770 57109 ZMUO.029684 *Euura dispar* (Zaddach, 1876) adult male 1 Finland Eurajoki 61.229, 21.532 2016-06-28 M. Prous ZMUO [MZ479429](#)
- 152516 56855 ZMUO.028334 *Euura dispar* (Zaddach, 1876) adult male 1 Finland Kiiminki 65.1098, 25.8496 2015-07-23 Marko Mutanen, Sylvia Mutanen M. Prous ZMUO [MZ479471](#)
- 152517 56856 ZMUO.028336 *Euura dispar* (Zaddach, 1876) adult male 1 Finland Kiiminki 65.1098, 25.8496 2015-07-12 Marko Mutanen, Sylvia Mutanen M. Prous ZMUO [MZ479409](#)
- 166360 84146 DEI-GISHym84146 *Euura dispar* (Zaddach, 1876) adult female 1 Finland Kitee, Papinniemi [6883:3656] 62.025, 29.99 2019-06-12 A.D. Liston netting A. D. Liston SDEI [MZ479509](#) [MW939715](#) [MW939797](#)
- 178870 111659 <http://id.luomus.fi/GL.3514> *Euura dispar* (Zaddach, 1876) adult female 1 Finland Uusimaa Munksnaes 60.19944, 24.87527 1967-08-11 E. Lindqvist E. Lindqvist holotype *Pteronidea pseudodispar* Lindqvist, 1969 MZH
- 152508 56847 ZMUO.028320 *Euura dispar* (Zaddach, 1876) adult male 1 Finland Praest-gardnaeset 60.2276, 19.9446 2015-05-23 Marko Mutanen M. Prous ZMUO [MZ479628](#)
- 158337 83956 DEI-GISHym83956 *Euura dispar* (Zaddach, 1876) adult female 1 Germany Sachsen-Anhalt Blankenburg/Harz: Steinkoepfe 51.739, 10.967 420 m 2019-06-01 23rd Symphyta Workshop netting M. Prous SDEI [MZ479486](#) [MW939700](#) [MW939815](#)
- 158338 83953 DEI-GISHym83953 *Euura dispar* (Zaddach, 1876) adult female 1 Germany Sachsen-Anhalt Blankenburg/Harz: Steinkoepfe 51.739, 10.967 420 m 2019-06-01 23rd Symphyta Workshop netting M. Prous SDEI [MZ479617](#) [MW939699](#) [MW939814](#)
- 158339 *Euura dispar* (Zaddach, 1876) adult female 1 Germany Sachsen-Anhalt Blankenburg/Harz: Steinkoepfe 51.739, 10.967 420 m 2019-06-01 23rd Symphyta Workshop netting M. Prous SDEI
- 148324 88519 DEI-GISHym88519 *Euura dispar* (Zaddach, 1876) adult male 1 Germany Brandenburg Eberswalde, Waldstrasse 19: Garten mit Waldrand 52.8264, 13.84136 2017-05-18 2017-05-25 A. Taeger Malaise trap SDEI [MZ479649](#) [MW939772](#) [MW939863](#)

215418 12579 DEI-GISHym12579 *Euura dispar* (Zaddach, 1876) larva 1 Germany Brandenburg Hoppegarten 52.518, 13.674 2020-06-01 A. Liston & M. Prous netting M. Prous ? *Betula pendula* SDEI

80306 50474 BC ZSM HYM 03306 *Euura dispar* (Zaddach, 1876) adult male 1 Germany Bayern Mittelbueg bei Nuernberg 49.48009, 11.217 316 m 1991-06-14 M. Kraus A. D. Liston ZSM [HQ563875](#)

75108 17596 DEI-GISHym17596 *Euura dispar* (Zaddach, 1876) adult male 1 Germany Brandenburg Noerdlich Golzow, 5.M 52.96667, 13.804 1994-06-01 DEI-Projekt S. M. Blank SDEI

80274 50442 BC ZSM HYM 03274 *Euura dispar* (Zaddach, 1876) adult male 1 Germany Bayern Ottmaring 49.03499, 11.541 377 m 2006-06-14 J. Hable M. Prous ? ZSM [KC972701](#)

80307 50475 BC ZSM HYM 03307 *Euura dispar* (Zaddach, 1876) adult male 1 Germany Bayern Ottmaring 49.03499, 11.541 377 m 2008-05-19 J. Hable M. Kraus & S. Schmidt ZSM

80308 50476 BC ZSM HYM 03308 *Euura dispar* (Zaddach, 1876) adult male 1 Germany Bayern Ottmaring 49.03499, 11.541 377 m 2008-06-14 J. Hable M. Kraus & S. Schmidt ZSM

67743 11328 DEI-GISHym11328 *Euura dispar* (Zaddach, 1876) adult female 1 Germany Mecklenburg-Vorpommern Ranzin, Oldenb. Holz 53.95114, 13.57204 2008-08-16 H.-J. Jacobs netting M. Prous ? SDEI [KC976869](#)

63245 11633 DEI-GISHym11633 *Euura dispar* (Zaddach, 1876) adult male 1 Italy Sicilia Etna Massif North, ca. 10 km SW Linguaglossa, Piano Provenzana 37.8, 15.03 1600 m 2010-05-16 A.D. Liston netting A. D. Liston SDEI [KC972820](#)

76419 19632 DEI-GISHym19632 *Euura dispar* (Zaddach, 1876) adult male 1 Portugal Viana do Castelo Monção 5 km SSE 42.04128, -8.44533 300 m 2012-05-13 Blank, Jacobs, Liston & Taeger netting M. Prous SDEI [KF642642](#)

76420 19631 DEI-GISHym19631 *Euura dispar* (Zaddach, 1876) adult female 1 Portugal Viana do Castelo Monção 5 km SSE 42.04128, -8.44533 300 m 2012-05-13 Blank, Jacobs, Liston & Taeger netting M. Prous SDEI [KF642799](#)

149748 21499 DEI-GISHym21499 *Euura dispar* (Zaddach, 1876) adult male 1 Sweden Torne Lappmark Bjoerkilden 68.409, 18.639 500 m 600 m 2016-07-09 A. Liston & M. Prous netting SDEI [MZ479419 MW939766 MW939876](#)

131807 21388 DEI-GISHym21388 *Euura dispar* (Zaddach, 1876) adult male 1 Sweden Torne Lappmark Bjoerkilden 2 km SE 68.395, 18.705 350 m 2016-07-01 A. Liston & M. Prous netting M. Prous SDEI [MZ479608 MW939757 MW939856](#)

63275 *Euura dispar* (Zaddach, 1876) larva 1 United Kingdom Scotland Dundreggan 57.2, -4.76666 2010-08-14 2010-08-21 G. T. Knight photography A. D. Liston *Betula* spec.

151389 84279 DEI-GISHym84279 *Euura excisa* (Thomson, 1863) adult female 1 Finland Northern Ostrobothnia Oulanka station 13 km E 66.361, 29.596 280 m 2018-06-12 A. Liston & M. Prous netting M. Prous SDEI [MZ479612 MW939743 MW939801](#)

- 133677 83588 DEI-GISHym83588 *Euura fahraei* (Thomson, 1863) larva 1 Germany Brandenburg Muencheberg, Dahmsdorf 52.53333, 14.1 2017-05-28 A.D. Liston A. D. Liston *Populus tremula* SDEI **MK624669 MK624759 MK624812**
- 151185 84191 DEI-GISHym84191 *Euura flavescens* (Stephens, 1835) adult male 1 Estonia Raplamaa Kastna 1 km N 58.863, 25.052 70 m 2018-05-22 M. Prous netting SDEI **MZ479498 MW939678 MW939784**
- 151640 56553 <http://id.luomus.fi/GL.3442> *Euura flavescens* (Stephens, 1835) adult male 1 Finland Lapponia inarensis Inari 69 28 1967-06-28 M. Prous ? MZH
- 68826 111737 <http://id.luomus.fi/GL.3544> *Euura frenalis* (Thomson, 1888) adult female 1 Finland Lapin Laeaeni Kilpisjäervi 69.05, 20.8 1935-07-11 lectotype *Nematus (Pteronidea) fastosus* var. *punctiscuta* Hellen, 1948 MZH
- 215698 *Euura frenalis* (Thomson, 1888) adult female 1 Finland Lapland Kilpisjäervi, Malla 69.065, 20.722 500 m 850 m 2020-06-25 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston ? SDEI
- 175171 111195 ZMUO.035747 *Euura frenalis* (Thomson, 1888) adult female 1 Finland Lapponia inarensis: Utsjoki: Ailegas 69.8773, 27.0651 2018-07-06 Marko Mutanen, Ne-stori Mutanen, Anttoni Mutanen M. Prous ZMUO **MZ479436 MW939714 MW939825**
- 152534 56873 ZMUO.028386 *Euura frenalis* (Thomson, 1888) adult male 1 Finland Muonio 67.8909, 23.7503 2014-07-06 Marko Mutanen ZMUO **MZ479634**
- 151404 84232 DEI-GISHym84232 *Euura frenalis* (Thomson, 1888) adult male 1 Finland Northern Ostrobothnia Oulanka station 8 km E 66.367, 29.503 270 m 2018-06-02 A. Liston & M. Prous netting M. Prous SDEI **MZ479473 MW939684 MW939848**
- 151656 56561 Prep.108.OR *Euura frenalis* (Thomson, 1888) adult female 1 Finland Hame Paelkaene 61.33333, 24.26666 1959-06-16 CVV
- 215696 12616 DEI-GISHym12616 *Euura frenalis* (Thomson, 1888) adult male 1 Finland Lapland Pousu 68.847, 21.161 450 m 2020-06-27 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston ? SDEI
- 215697 12604 DEI-GISHym12604 *Euura frenalis* (Thomson, 1888) adult male 1 Finland Lapland Pousu 68.847, 21.161 450 m 2020-06-26 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI
- 151403 84220 DEI-GISHym84220 *Euura frenalis* (Thomson, 1888) adult male 1 Finland Northern Ostrobothnia Taivalkoski 22 km NE 65.722, 28.569 250 m 2018-06-01 A. Liston & M. Prous netting M. Prous SDEI **MZ479535 MW939681 MW939791**
- 151405 84222 DEI-GISHym84222 *Euura frenalis* (Thomson, 1888) adult male 1 Finland Northern Ostrobothnia Taivalkoski 22 km NE 65.722, 28.569 250 m 2018-06-01 A. Liston & M. Prous netting M. Prous SDEI **MZ479538 MW939682 MW939793**
- 151406 84219 DEI-GISHym84219 *Euura frenalis* (Thomson, 1888) adult male 1 Finland Northern Ostrobothnia Taivalkoski 22 km NE 65.722, 28.569 250 m 2018-06-01 A. Liston & M. Prous netting M. Prous SDEI **MZ479480 MW939680 MW939850**
- 158898 12057 DEI-GISHym12057 *Euura frenalis* (Thomson, 1888) adult male 1 Norway Finnmark Batsfjord 33 km SW 70.47, 28.97 280 m 2019-06-27 A. Liston & M. Prous netting M. Prous SDEI **MZ479623 MW939701 MW939840**

- 50638 3851 DEI-GISHym3851 *Euura frenalis* (Thomson, 1888) adult female 1 Russia Kanin, Halbinsel 68 45 B. Poppius lectotype *Pteronus fastosus* Konow, 1904 SDEI 68827 111964 <http://id.luomus.fi/GL.3546> *Euura frenalis* (Thomson, 1888) adult female 1 Russia Murmansкая Oblast Kola-Halbinsel, Ponoj 67.06666, 41.11666 1913-07-14 M. Prous lectotype *Nematus (Pteronidea) fastosus* var. *ponojense* Hellen, 1948 MZH 150441 88724 DEI-GISHym88724 *Euura frenalis* (Thomson, 1888) adult male 1 Sweden Torne Lappmark Abisko: Mt. Njulla 68.362, 18.73 400 m 950 m 2016-06-30 A. Liston & M. Prous netting M. Prous SDEI [MZ479542 MW939769 MW939877](#)
- 87275 31129 DEI-GISHym31129 *Euura frenalis* (Thomson, 1888) adult female 1 Sweden Norrbottens Laen Abisko: Mt. Njulla above treeline 68.362, 18.73 700 m 900 m 2012-06-29 A.D. Liston & A. Taeger netting M. Prous ? SDEI
- 87278 31132 DEI-GISHym31132 *Euura frenalis* (Thomson, 1888) adult female 1 Sweden Norrbottens Laen Abisko: Mt. Njulla above treeline 68.362, 18.723 900 m 2012-07-05 A.D. Liston & A. Taeger netting A. D. Liston SDEI [MZ479394 MW939717 MW939843](#)
- 87279 31133 DEI-GISHym31133 *Euura frenalis* (Thomson, 1888) adult female 1 Sweden Norrbottens Laen Abisko: Mt. Njulla above treeline 68.362, 18.723 900 m 2012-07-05 A.D. Liston & A. Taeger netting A. D. Liston SDEI
- 155524 88902 DEI-GISHym88902 *Euura frenalis* (Thomson, 1888) adult female 1 Sweden Jamtlands Lan Areskutan 63.43333, 13.1 C. G. Thomson F. Koch lectotype *Nematus frenalis* Thomson, 1888 MZLU
- 158214 12026 DEI-GISHym12026 *Euura frenalis* (Thomson, 1888) adult male 1 Sweden Norrbottens Laen Karesuando 27 km SE 68.249, 22.879 310 m 2014-06-13 A. Liston & M. Prous netting M. Prous SDEI [MZ479464 MW939745](#)
- 69847 20422 DEI-GISHym20422 *Euura frenalis* (Thomson, 1888) adult female 1 Sweden Norrbottens Laen Kiruna kommun, Abisko nationalpark, Nuolja Kalfjaell 68.35958, 18.71927 900 m 2006-06-26 2006-07-15 SMTP - Swedish Malaise Trap Project Malaise trap M. Prous SMTP
- 213598 12556 DEI-GISHym12556 *Euura frenalis* (Thomson, 1888) adult female 1 Sweden Torne Lappmark Nikkaluokta 7 km NE 67.89, 19.138 500 m 1050 m 2016-07-08 A. Liston & M. Prous netting M. Prous ? SDEI [MZ479511 MW939748 MW939818](#)
- 131840 21332 DEI-GISHym21332 *Euura frenalis* (Thomson, 1888) adult male 1 Sweden Torne Lappmark: Rensjoen, near Kiruna 68.068, 19.022 2016-06-22 A.D. Liston netting M. Prous SDEI [MZ479405 MW939759](#)
- 158846 83976 DEI-GISHym83976 *Euura freyja* (Liston, Taeger & Blank, 2009) adult female 1 Norway Finnmark Grense Jakobselv 8 km S 69.7, 30.8 250 m 2019-06-24 A. Liston & M. Prous netting A. D. Liston SDEI [MZ479668 MW939746 MW939836](#)
- 146879 80498 DEI-GISHym80498 *Euura glutinosae* Cameron, 1882 adult female 1 Austria Lower Austria Etzen 48.11666, 15.23333 2016-09-06 E. Altenhofer rearing M. Prous 2017-08-06 *Alnus glutinosa* SDEI [MZ479569 MW939673 MW939787](#)
- 67843 11403 DEI-GISHym11403 *Euura glutinosae* Cameron, 1882 adult female 1 France Aulus-les-Bains 42.8, 1.33333 2010-07-01 H. Savina rearing A. D. Liston *Alnus* spec. SDEI [KC974817](#)

- 62541 *Euura glutinosae* Cameron, 1882 larva 1 France Bonac-sur-Lez 42.88333, 0.96666 2008-09-01 2008-09-30 H. Savina A. D. Liston *Alnus glutinosa* FOTO
- 151566 84469 DEI-GISHym84469 *Euura glutinosae* Cameron, 1882 larva 1 Germany Rhineland Palatinate Schoenenberg-Kuebelberg, 1 km S 49.3988, 7.3865 250 m 2018-07-14 M. Prous M. Prous ? *Alnus glutinosa* SDEI
- 158771 84096 DEI-GISHym84096 *Euura glutinosae* Cameron, 1882 adult male 1 Germany Sachsen-Anhalt Stolberg: Grube Luise, Bachtal 51.556, 10.976 350 m 2019-05-28 23rd Symphyta Workshop netting M. Prous SDEI [MZ479415](#) [MW939703](#) [MW939845](#)
- 216953 *Euura glutinosae* Cameron, 1882 adult female 1 Russia Moskowskaja Oblast Sergiev-Posad district, Zolotilovo village 56.275, 37.987 2019-08-24 A. Boldyrev A. Boldyrev 2020-03-20 *Alnus* spec. FOTO
- 216955 *Euura glutinosae* Cameron, 1882 adult female 1 Russia Moskowskaja Oblast Sergiev-Posad district, Zolotilovo village 56.275, 37.987 2019-09-01 A. Boldyrev A. Boldyrev 2020-03-14 *Alnus* spec. FOTO
- 151604 111986 GNM-HYME000000210 *Euura glutinosae* Cameron, 1882 adult female 1 Sweden Skane Skrifvaremoellan vid Tvedoerra laegerplats 55.68333, 13.41666 1880-06-01 1880-06-30 G. Moeller lectotype *Nematus viridissimus* Moeller, 1882 *Alnus* spec. GNM
- 216659 111909 B.M.TYPE HYM1.623 *Euura glutinosae* Cameron, 1882 adult female 1 United Kingdom England Worcestershire [original label], Worcester [original description] 1875-09-21 J. E. Fletcher rearing lectotype *Nematus glutinosae* Cameron, 1882 *Alnus glutinosa* BMNH
- 133501 80261 DEI-GISHym80261 *Euura humeralis* (Serville, 1823) adult male 1 Germany Brandenburg Strausberg 3 km E 52.566, 13.934 80 m 2017-04-09 A. Liston & M. Prous netting M. Prous SDEI [MK624681](#) [MK624769](#) [MK624831](#)
- 166674 12505 DEI-GISHym12505 *Euura hypoxantha* (Foerster, 1854) adult female 1 Austria Lower Austria Rappottenstein 48.51666, 15.06666 2002-08-07 E. Altenhofer rearing A. Taeger 2003-05-13 *Salix purpurea* SDEI
- 166818 *Euura hypoxantha* (Foerster, 1854) adult male 1 Estonia Dorpat 58.36611, 26.73611 1883-06-01 M. Prous SDEI
- 166819 *Euura hypoxantha* (Foerster, 1854) adult male 1 Estonia Dorpat 58.36611, 26.73611 1883-05-08 M. Prous SDEI
- 173750 110182 ZMUO.034708 *Euura hypoxantha* (Foerster, 1854) adult 1 Finland Karella borealis: Kitee: Otravaara 61.8873, 30.1286 2018-05-27 Marko Mutanen ZMUO
- 155486 58924 ZMUO.030833 *Euura hypoxantha* (Foerster, 1854) adult female 1 Finland Lapland Kilpisjäervi, Saana [767:325] 69.04563, 20.85539 2016-08-14 M. Mutanen, T. Nyman rearing M. Prous 2017-01-01 2017-12-31 *Salix myrsinifolia* ZMUO
- 152804 57143 ZMUO.029689 *Euura hypoxantha* (Foerster, 1854) adult 1 Finland Linnanmaa 65.0639, 25.4807 2016-06-20 Marko Mutanen ZMUO
- 176717 106507 ZMUO.030897 *Euura hypoxantha* (Foerster, 1854) adult 1 Finland Ostrobotnia ouluensis: Oulu: Linnanmaa 65.0639, 25.4807 2016-06-21 Marko Mutanen ZMUO

- 176718 106506 ZMUO.030896 *Euura hypoxantha* (Foerster, 1854) adult 1 Finland Ostrobotnia ouluensis: Oulu: Linnanmaa 65.0639, 25.4807 Marko Mutanen ZMUO 49889 3301 DEI-GISHym3301 *Euura hypoxantha* (Foerster, 1854) adult male 1 Germany Nordrhein-Westfalen Aachen 50.76666, 6.1 M. Prous syntype *Nematus hypoxanthus* Foerster, 1854 ZSM
- 80289 50457 BC ZSM HYM 03289 *Euura hypoxantha* (Foerster, 1854) adult male 1 Germany Bayern Guenthersbuehl 49.54299, 11.22299 403 m 1992-05-22 M. Kraus & S. Schmidt ZSM [JN283958](#)
- 166479 83946 DEI-GISHym83946 *Euura hypoxantha* (Foerster, 1854) adult male 1 Germany Thueringen Ilfeld: Netzkater: Brandesbachtal 51.6, 10.81 350 m 400 m 2019-05-31 23rd Symphyta Workshop netting M. Prous SDEI [MZ479662](#) [MW939705](#) [MW939842](#)
- 80288 50456 BC ZSM HYM 03288 *Euura hypoxantha* (Foerster, 1854) adult male 1 Germany Bayern Ottmaring 49.03499, 11.541 377 m 2006-08-03 J. Hable M. Kraus & S. Schmidt ZSM
- 166264 12209 DEI-GISHym12209 *Euura hypoxantha* (Foerster, 1854) adult male 1 Norway Finnmark Skoltebyen 3 km NW 69.697, 29.31 70 m 2019-06-26 A. Liston & M. Prous netting M. Prous SDEI
- 213605 12054 DEI-GISHym12054 *Euura hypoxantha* (Foerster, 1854) adult male 1 Norway Finnmark Skoltebyen 3 km NW 69.697, 29.31 70 m 2019-06-26 A. Liston & M. Prous netting M. Prous SDEI
- 216301 *Euura hypoxantha* (Foerster, 1854) adult male 1 Norway Finnmark Skoltebyen 3 km NW 69.697, 29.31 70 m 2019-06-26 A. Liston & M. Prous netting M. Prous SDEI
- 152120 86211 DEI-GISHym86211 *Euura hypoxantha* (Foerster, 1854) adult male 1 Russia Primorskiy Kray Gornotajozhnoe, 1 km E 43.694, 132.168 150 m 2016-05-22 K. Kramp, M. Prous & A. Taeger netting M. Prous SDEI
- 158245 80649 DEI-GISHym80649 *Euura hypoxantha* (Foerster, 1854) adult female 1 Russia Primorsky Krai Steklyanukha 43.349, 132.458 40 m 2019-05-07 M. Prous netting M. Prous ? SDEI
- 152128 86752 DEI-GISHym86752 *Euura hypoxantha* (Foerster, 1854) adult female 1 Russia Primorsky Krai Zolotaya Dolina E 42.943, 133.161 40 m 2016-06-10 K. Kramp, M. Prous & A. Taeger netting SDEI
- 155485 58923 ZMUO.030832 *Euura imperfecta* (Zaddach, 1876) adult male 1 Finland Salo [6701:3286] 60.36797, 23.12948 2017-05-30 M. Mutanen, T. Mutanen rearing M. Prous *Larix* spec. ZMUO [MZ479591](#) [MW939728](#) [MW939806](#)
- 66030 11928 DEI-GISHym11928 *Euura infirma* (Foerster, 1854) adult male 1 Germany Thueringen Brandesbachtal bei Netzkater N Ilfeld, Wiese, mittlere Hanglage 51.6, 10.81 350 m 2010-05-23 A. Taeger A. Taeger SDEI [KC972658](#) [MW939721](#) [MW939821](#)
- 158222 80655 DEI-GISHym80655 *Euura krausi* (Taeger & Blank, 1998) adult female 1 Russia Primorskiy Kray Anisimovka: Gribanovka 1 km N 43.126, 132.797 450 m 2019-05-08 M. Prous netting M. Prous SDEI [MZ479616](#) [MW939711](#) [MW939839](#)
- 175205 108977 ZMUO.033448 *Euura leptocephalus* (Thomson, 1863) adult female 1 Finland Lapponia inarensis: Utsjoki: Ailigas 69.8773, 27.0651 2017-07-08 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen M. Prous ZMUO [MZ479530](#)

- 215726 84503 DEI-GISHym84503 *Euura leptocephalus* (Thomson, 1863) adult female 1 Finland Lapland Leutsuvaara 68.917, 20.933 550 m 700 m 2020-06-27 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI
- 215725 12610 DEI-GISHym12610 *Euura leptocephalus* (Thomson, 1863) adult female 1 Finland Lapland Pousu 68.847, 21.161 450 m 2020-06-27 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI
- 157411 *Euura leptocephalus* (Thomson, 1863) adult female 1 Finland Utsjoki, Outakoski 69.6, 25.96666 1948-06-22 E. Lindqvist M. Prous SDEI
- 213701 12065 DEI-GISHym12065 *Euura leptocephalus* (Thomson, 1863) adult male 1 Norway Finnmark Batsfjord 9 km SW 70.568, 29.554 230 m 2019-06-27 A. Liston & M. Prous netting M. Prous SDEI [MZ479607](#) [MW939697](#) [MW939813](#)
- 131804 21386 DEI-GISHym21386 *Euura leptocephalus* (Thomson, 1863) adult female 1 Sweden Torne Lappmark Abisko: Mt. Njulla 68.362, 18.73 400 m 950 m 2016-06-30 A. Liston & M. Prous netting M. Prous SDEI [MZ479518](#) [MW939758](#) [MW939855](#)
- 150447 88730 DEI-GISHym88730 *Euura leptocephalus* (Thomson, 1863) adult male 1 Sweden Torne Lappmark Abisko: Mt. Njulla 68.362, 18.73 400 m 950 m 2016-06-30 A. Liston & M. Prous netting M. Prous SDEI [MZ479551](#) [MW939770](#) [MW939878](#)
- 69796 59083 NHRS-HEVA000003974 *Euura leptocephalus* (Thomson, 1863) adult female 1 Sweden Lapponia intermedia 66 19 C. H. Boheman M. Prous holotype *Nematus leptocephalus* Thomson, 1863 NHRS
- 178904 12535 DEI-GISHym12535 *Euura leptocephalus* (Thomson, 1863) adult female 1 Sweden Torne Lappmark Nikkaluokta 7 km NE 67.89, 19.138 500 m 1050 m 2016-07-08 A. Liston & M. Prous netting M. Prous SDEI
- 151423 84256 DEI-GISHym84256 *Euura lichtwardti* (Konow, 1903) adult male 1 Finland Northern Ostrobothnia Oulanka station 18 km SE 66.283, 29.653 150 m 2018-06-08 SDEI Hym-group netting M. Prous SDEI [MZ479653](#) [MW939685](#) [MW939802](#)
- 179080 12072 DEI-GISHym12072 *Euura longicauda* (Hellen, 1948) adult male 1 Norway Finnmark Batsfjord 2 km SW 70.624, 29.672 70 m 2019-06-27 A. Liston & M. Prous netting M. Prous SDEI [MZ479524](#) [MW939708](#) [MW939884](#)
- 151424 56546 ZMUO.030814 *Euura longiserra* (Thomson, 1863) adult female 1 Finland Northern Ostrobothnia Oulu, kasvipuutarha [7219:3427] 65.06365, 25.45948 2017-06-08 R. Jarkko M. Prous ZMUO [MZ479505](#) [MW939672](#) [MW939785](#)
- 213610 12074 DEI-GISHym12074 *Euura malaisei* (Hellén, 1970) adult male 1 Norway Finnmark Batsfjord 2 km SW 70.624, 29.672 70 m 2019-06-27 A. Liston & M. Prous netting M. Prous SDEI [MZ479572](#) [MW939698](#) [MW939834](#)
- 157574 12015 DEI-GISHym12015 *Euura miltonota* (Zaddach, 1883) adult female 1 Germany Berlin, Wuhletal 52.51, 13.572 2019-04-19 K. Kramp, A. Liston & M. Prous netting M. Prous SDEI [MZ479593](#) [MW939738](#) [MW939838](#)
- 151385 84264 DEI-GISHym84264 *Euura montana* (Zaddach, 1883) adult male 1 Finland Lapland Tolva 7 km W 66.223, 28.552 330 m 450 m 2018-06-09 SDEI Hym-group netting M. Prous SDEI [MZ479638](#) [MW939687](#) [MW939804](#)

- 89412 31247 DEI-GISHym31247 *Euura myosotidis* (Fabricius, 1804) adult male 1 Estonia Laanemaa Virtsu 2 km E 58.574, 23.543 5 m 2015-06-06 A.D. Liston, M. Prous & A. Taeger netting A. D. Liston SDEI [KY698137](#) [KY698263](#) [MK624827](#)
- 150903 84182 DEI-GISHym84182 *Euura nigricornis* (Serville, 1823) adult female 1 Germany Brandenburg Trebnitz 52.53333, 14.21666 2017-05-21 A.D. Liston netting A. D. Liston SDEI [MK624674](#) [MK624763](#) [MK624816](#)
- 148321 88516 DEI-GISHym88516 *Euura obducta* (Hartig, 1837) adult female 1 Germany Brandenburg Eberswalde, Waldstrasse 19: Garten mit Waldrand 52.8264, 13.84136 2017-05-18 2017-05-25 A. Taeger Malaise trap SDEI [MZ479490](#) [MW939773](#) [MW939862](#)
- 67481 17065 DEI-GISHym17065 *Euura oligospila* (Foerster, 1854) adult female 1 Austria Salzburg Alpendorf Dachstein-West 47.514, 13.451 950 m 2010-07-25 A.D. Liston & A. Taeger A. Taeger SDEI [KC974914](#) [MW939724](#) [MW939824](#)
- 89414 31226 DEI-GISHym31226 *Euura oligospila* (Foerster, 1854) adult female 1 Estonia Ida-Virumaa Ontika, 1.5 km NE 59.443, 27.315 50 m 2015-06-03 A.D. Liston, M. Prous & A. Taeger netting A. D. Liston SDEI [MZ479423](#) [MW939755](#) [MW939786](#)
- 149738 31239 DEI-GISHym31239 *Euura oligospila* (Foerster, 1854) adult male 1 Estonia Parnumaa Riisa 1 km N 58.489, 24.982 25 m 2015-06-05 A.D. Liston, M. Prous & A. Taeger netting M. Prous SDEI [MZ479588](#) [MW939752](#) [MW939870](#)
- 152784 57123 ZMUO.029686 *Euura oligospila* (Foerster, 1854) adult male 1 Finland Enontekioe 69.0577, 20.8143 2016-07-09 Marko Mutanen ZMUO
- 151657 56562 Prep.122.OR *Euura oligospila* (Foerster, 1854) adult female 1 Finland Uusimaa Helsinki 60.17555, 24.93416 1962-06-12 CVV
- 151671 56577 Prep.104.OR *Euura oligospila* (Foerster, 1854) adult female 1 Finland Uusimaa Helsinki, Villinki 60.15861, 25.11361 1961-08-05 CVV
- 152767 57106 ZMUO.029674 *Euura oligospila* (Foerster, 1854) adult female 1 Finland Kiiminki 65.1098, 25.8496 2016-08-05 M. Prous ZMUO [MZ479420](#)
- 155601 58983 ZMUO.030844 *Euura oligospila* (Foerster, 1854) adult female 1 Finland Lapland Kilpisjäervi, Saana [767:325] 69.04563, 20.85539 2016-08-14 M. Mutanen, T. Nyman rearing M. Prous *Salix phylicifolia* ZMUO [MZ479440](#) [MW939731](#) [MW939811](#)
- 175081 106948 ZMUO.031369 *Euura oligospila* (Foerster, 1854) adult female 1 Finland Lapponia enontekiensis: Enontekioe: Kilpisjäervi, Saana 69.0456, 20.8554 2016-08-14 Marko Mutanen, Tommi Nyman M. Prous ? *Salix phylicifolia* ZMUO
- 175384 111137 ZMUO.035689 *Euura oligospila* (Foerster, 1854) adult male 1 Finland Lapponia inarensis: Utsjoki: Boratbovcis 70.0641, 27.7223 2018-07-05 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen M. Prous ? ZMUO
- 175437 111191 ZMUO.035743 *Euura oligospila* (Foerster, 1854) adult male 1 Finland Lapponia inarensis: Utsjoki: Garegassuolu 69.3894, 25.8423 2018-07-06 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO
- 175714 111090 ZMUO.035642 *Euura oligospila* (Foerster, 1854) adult female 1 Finland Lapponia inarensis: Utsjoki: Rovisuvanto 69.4703, 25.8635 2018-07-04 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen M. Prous ? ZMUO

- 175756 111164 ZMUO.035716 *Euura oligospila* (Foerster, 1854) adult female 1 Finland Lapponia inarensis: Utsjoki: Vetsijokisuu 69.9667, 27.3007 2018-07-05 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen M. Prous ? ZMUO
- 175760 111160 ZMUO.035712 *Euura oligospila* (Foerster, 1854) adult female 1 Finland Lapponia inarensis: Utsjoki: Vetsijokisuu 69.9667, 27.3007 2018-07-05 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen ZMUO
- 67828 11390 DEI-GISHym11390 *Euura oligospila* (Foerster, 1854) adult female 1 France Bethmale 42.86666, 1.08333 2010-07-04 H. Savina A. D. Liston SDEI [KC973945](#)
- 68227 17894 DEI-GISHym17894 *Euura oligospila* (Foerster, 1854) adult male 1 France Bethmale 42.86666, 1.08333 2009-09-01 2009-09-30 H. Savina A. D. Liston 2010-05-20 Salix spec. SDEI [KC973597](#)
- 49891 3372 DEI-GISHym3372 *Euura oligospila* (Foerster, 1854) adult female 1 Germany Nordrhein-Westfalen Aachen Umgebung 50.76666, 6.1 lectotype *Nematus oligospilus* Foerster, 1854 ZSM
- 215748 *Euura oligospila* (Foerster, 1854) adult 7 Germany Brandenburg Muencheberg, Seelower Str. 52.50167, 14.15334 2013-05-17 A.D. Liston M. Prous SDEI
- 215749 84695 DEI-GISHym84695 *Euura oligospila* (Foerster, 1854) adult male 1 Germany Brandenburg Muencheberg, Seelower Str. 52.50167, 14.15334 2013-05-17 A.D. Liston M. Prous SDEI
- 217266 84738 DEI-GISHym84738 *Euura oligospila* (Foerster, 1854) adult female 1 Germany Brandenburg Muencheberg, Seelower Str. 52.50167, 14.15334 2013-05-17 A.D. Liston M. Prous SDEI
- 67908 11482 DEI-GISHym11482 *Euura oligospila* (Foerster, 1854) adult female 1 Germany Brandenburg Praedikow 52.63333, 14.01666 2011-05-01 A.D. Liston netting A. D. Liston SDEI [KC972931](#) [MW939720](#) [MW939820](#)
- 152122 86305 DEI-GISHym86305 *Euura oligospila* (Foerster, 1854) adult female 1 Russia Primorsky Krai Arsenyev, Ski-Base Bodrost 44.122, 133.27 200 m 2016-05-26 K. Kramp, M. Prous & A. Taeger netting M. Prous SDEI [MZ479625](#)
- 166478 80721 DEI-GISHym80721 *Euura oligospila* (Foerster, 1854) adult female 1 Russia Primorsky Krai Gornotajozhnoe, 2 km W 43.694, 132.135 80 m 2019-05-14 M. Prous netting M. Prous SDEI [MZ479487](#) [MW939704](#) [MW939841](#)
- 166745 80754 DEI-GISHym80754 *Euura oligospila* (Foerster, 1854) adult female 1 Russia Primorsky Krai Gornotajozhnoe, 2 km W 43.694, 132.135 2019-05-16 M. Prous & S. Tuerk netting M. Prous SDEI
- 67907 11481 DEI-GISHym11481 *Euura oligospila* (Foerster, 1854) adult female 1 Slovakia Liptovsky Hradok ESE 10 km, Svarinska valley, Svarin S 49.00916, 19.853 695 m 730 m 2005-06-19 A.D. Liston netting A. D. Liston SDEI [KC976992](#)
- 149740 21410 DEI-GISHym21410 *Euura oligospila* (Foerster, 1854) adult female 1 Sweden Torne Lappmark Abisko 6 km E 68.348, 18.969 400 m 2016-07-04 A. Liston & M. Prous netting M. Prous SDEI [MZ479611](#) [MW939765](#) [MW939875](#)
- 149739 21395 DEI-GISHym21395 *Euura oligospila* (Foerster, 1854) adult male 1 Sweden Torne Lappmark Abisko 6 km W 68.342, 18.691 650 m 900 m 2016-07-02 A. Liston & M. Prous netting M. Prous SDEI [MZ479476](#) [MW939767](#) [MW939788](#)

- 152057 83843 DEI-GISHym83843 *Euura oligospila* (Foerster, 1854) larva 1 Sweden Torne Lappmark Abisko National Park, Abisko Oestra 68.35088, 18.83086 400 m 2018-08-29 A.D. Liston netting M. Prous SDEI [MZ479565 MW939734 MW939817](#)
- 155494 88899 DEI-GISHym88899 *Euura oligospila* (Foerster, 1854) adult female 1 Sweden Skane Igelosa 55.763, 13.274 1835-08-16 rearing M. Prous MZLU
- 217184 111959 MZLU2017330 *Euura oligospila* (Foerster, 1854) adult male 1 Sweden Malmoehus Laen Lund 55.7, 13.18333 lectotype *Nematus microcercus* Thomson, 1871 MZLU
- 96476 21367 DEI-GISHym21367 *Euura oligospila* (Foerster, 1854) adult female 1 Sweden Torne Lappmark: Abisko: lowest 3 km of Abisko River 68.356, 18.769 350 m 2016-06-28 A.D. Liston netting A. D. Liston SDEI [MZ479441 MW939753](#)
- 216660 111910 B.M.TYPE HYM.1.625 *Euura oligospila* (Foerster, 1854) adult female 1 United Kingdom England Worcestershire [original label], Worcester [original description] 1877-10-01 1877-10-31 R. B. Benson *Nematus salicivorus* Cameron, 1882 *Salix viminalis*
- 50662 3863 DEI-GISHym3863 *Euura pallens* (Konow, 1903) adult female 1 Russia Irkutsk 52.33333, 104.25 lectotype *Pteronus pallens* Konow, 1903 SDEI
- 50663 3864 DEI-GISHym3864 *Euura pallens* (Konow, 1903) adult female 1 Russia Irkutsk 52.33333, 104.25 paralectotype *Pteronus pallens* Konow, 1903 SDEI
- 94847 84966 DEI-GISHym84966 *Euura papillosa* (Retzius, 1783) adult male 1 Japan Nagano Yamanouchi, Road 471/502 36.744, 138.524 1600 m 2016-07-17 A. Taeger netting M. Prous SDEI [MZ479449 MW939780 MW939857](#)
- 93919 80108 DEI-GISHym80108 *Euura parvilabris* (Thomson, 1863) adult male 1 Sweden Torne Lappmark Bjoerkilden 68.409, 18.639 500 m 850 m 2016-07-01 A. Liston & M. Prous netting M. Prous SDEI [MZ479465 MW939779 MW939853](#)
- 89415 31242 DEI-GISHym31242 *Euura poecilonota* (Zaddach, 1876) adult female 1 Estonia Viljandimaa Sandra 58.453, 25.037 25 m 2015-06-05 A.D. Liston, M. Prous & A. Taeger netting M. Prous SDEI
- 90029 31243 DEI-GISHym31243 *Euura poecilonota* (Zaddach, 1876) adult female 1 Estonia Viljandimaa Sandra 58.453, 25.037 25 m 2015-06-05 A.D. Liston, M. Prous & A. Taeger netting M. Prous SDEI
- 90031 *Euura poecilonota* (Zaddach, 1876) adult female 1 Estonia Viljandimaa Sandra 58.453, 25.037 25 m 2015-06-05 A.D. Liston, M. Prous & A. Taeger netting M. Prous SDEI
- 173133 106442 ZMUO.029739.1 *Euura poecilonota* (Zaddach, 1876) adult 1 Finland Karelia australis: Kotka: Salminlahti 60.5495, 27.0082 2016-05-29 M. Prous ZMUO
- 75131 17620 DEI-GISHym17620 *Euura poecilonota* (Zaddach, 1876) adult female 1 Finland Lapin Laeaeni Kevo 69.75, 27.01666 2001-06-03 2001-06-07 Kevo Subarctic Research Institute rearing A. Taeger *Betula pubescens* SDEI
- 178869 12527 DEI-GISHym12527 *Euura poecilonota* (Zaddach, 1876) adult male 1 Finland Lapin Laeaeni Kevo Subarctic Research Institute 69.75, 27.01659 240 m 2001-06-09 2001-06-11 Kevo Subarctic Research Institute M. Prous ? 2001-06-16 *Betula pubescens* SDEI

- 151401 84462 DEI-GISHym84462 *Euura poecilonota* (Zaddach, 1876) adult female 1 Finland Northern Ostrobothnia Oulanka station 18 km SE 66.283, 29.653 150 m 2018-06-13 A. Liston & M. Prous netting M. Prous SDEI
- 215755 *Euura poecilonota* (Zaddach, 1876) adult female 1 Finland Lapland Pousu 68.847, 21.161 450 m 2020-06-27 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI
- 75154 17640 DEI-GISHym17640 *Euura poecilonota* (Zaddach, 1876) adult female 1 Germany Bayern Dirnberg bei Boebrach Muehle 49.05, 13.05 S. M. Blank M. Prous SDEI
- 80279 50447 BC ZSM HYM 03279 *Euura poecilonota* (Zaddach, 1876) adult female 1 Germany Bayern Guenthersbuehl 49.54299, 11.22299 403 m 1992-05-22 M. Kraus & S. Schmidt ZSM [KC974682](#)
- 80280 50448 BC ZSM HYM 03280 *Euura poecilonota* (Zaddach, 1876) adult female 1 Germany Bayern Guenthersbuehl 49.54299, 11.22299 403 m 1992-06-06 M. Kraus & S. Schmidt ZSM [KC974794](#)
- 1166 17621 DEI-GISHym17621 *Euura poecilonota* (Zaddach, 1876) adult female 1 Germany Brandenburg Noerdlich Britz, 6.M 52.91667, 13.804 1993-05-11 1993-05-13 DEI-Projekt Malaise trap A. Taeger SDEI
- 152113 86351 DEI-GISHym86351 *Euura poecilonota* (Zaddach, 1876) adult female 1 Russia Primorsky Krai Arsenyev, Ski-Base Bodrost 44.122, 133.27 200 m 2016-05-30 K. Kramp, M. Prous & A. Taeger netting M. Prous ? SDEI
- 152119 86176 DEI-GISHym86176 *Euura poecilonota* (Zaddach, 1876) adult female 1 Russia Primorskiy Kray Gornotajozhnoe, 1 km E 43.694, 132.168 150 m 2016-05-22 K. Kramp, M. Prous & A. Taeger netting M. Prous ? SDEI [MZ479489](#) [MW939710](#) [MW939794](#)
- 152114 86727 DEI-GISHym86727 *Euura poecilonota* (Zaddach, 1876) adult female 1 Russia Primorsky Krai Nakhodka 10 km ESE: Beregovoj 42.788, 133.03 30 m 2016-06-07 K. Kramp, M. Prous & A. Taeger netting M. Prous ? SDEI
- 152115 86753 DEI-GISHym86753 *Euura poecilonota* (Zaddach, 1876) adult female 1 Russia Primorsky Krai Nikolaevka 5 km NNE 43.137, 133.249 140 m 2016-06-11 K. Kramp, M. Prous & A. Taeger netting M. Prous ? SDEI
- 149750 21400 DEI-GISHym21400 *Euura poecilonota* (Zaddach, 1876) adult female 1 Sweden Norrbottens Laen Abisko 9 km E (Stordalen) 68.35, 19.035 400 m 2016-07-04 A. Liston & M. Prous netting M. Prous SDEI [MZ479537](#) [MW939754](#) [MW939859](#)
- 87286 31140 DEI-GISHym31140 *Euura poecilonota* (Zaddach, 1876) adult female 1 Sweden Norrbottens Laen Abisko National Park, E10 68.353, 18.815 390 m 2012-06-19 A.D. Liston netting M. Prous SDEI
- 87291 31145 DEI-GISHym31145 *Euura poecilonota* (Zaddach, 1876) adult female 1 Sweden Norrbottens Laen Abisko National Park, E10 68.353, 18.815 390 m 2012-06-23 A.D. Liston & A. Taeger netting M. Prous SDEI
- 210680 *Euura poecilonota* (Zaddach, 1876) adult female 1 Sweden Torne Lappmark Bjoerkilden 68.409, 18.639 500 m 850 m 2016-07-01 A. Liston & M. Prous netting M. Prous SDEI

210678 *Euura poecilonota* (Zaddach, 1876) adult female 1 Sweden Torne Lappmark: Abisko, Mt Njulla 68.365, 18.72 600 m 900 m 2016-06-23 A.D. Liston netting M. Prous SDEI

210679 *Euura poecilonota* (Zaddach, 1876) adult female 1 Sweden Torne Lappmark: Bjoerkilden 2 km SE 68.395, 18.705 500 m 800 m 2016-06-27 A.D. Liston netting M. Prous SDEI

155571 58973 ZMUC.030839 *Euura pumilio* (Konow, 1903) adult male 1 Finland Karelia borealis Otravaara [61.8877, 30.1096] 61.8877, 30.1096 2017-05-26 M. Mutanen M. Prous ZMUC [MZ479389](#) [MW939691](#) [MW939809](#)

151402 84261 DEI-GISHym84261 *Euura punctifrons* (Malaise, 1921) adult male 1 Finland Northern Ostrobothnia Oulanka station 8 km E 66.367, 29.503 270 m 2018-06-08 SDEI Hym-group netting M. Prous SDEI [MZ479531](#) [MW939686](#) [MW939803](#)

89193 31253 DEI-GISHym31253 *Euura punicea* (Christ, 1791) adult female 1 Estonia Laanemaa Karuse 1 km S 58.608, 23.695 25 m 2015-06-06 A.D. Liston, M. Prous & A. Taeger netting A. D. Liston SDEI [MZ479516](#) [MW939683](#) [MW939789](#)

63749 *Euura respondens* (Foerster, 1854) adult female 1 Argentina Argentinien (Staat) 2003-11-15 S. M. Blank & C. Kutzscher S. M. Blank SDEI

68083 11613 DEI-GISHym11613 *Euura respondens* (Foerster, 1854) adult female 1 Argentina Rio Negro El Condor near Viedma -40.8, -63 2001-12-05 2001-12-14 C. Kutzscher netting S. M. Blank SDEI [KC972662](#)

53155 *Euura respondens* (Foerster, 1854) adult female 1 Argentina Jujuy Tilcara N 1 km -23.5605, -65.39166 2003-10-29 S. M. Blank S. M. Blank *Salix babylonica* SDEI

68070 11597 DEI-GISHym11597 *Euura respondens* (Foerster, 1854) adult female 1 Argentina Jujuy Tilcara N 1 km -23.5605, -65.39166 2003-10-29 S. M. Blank S. M. Blank *Salix babylonica* SDEI [KC973924](#)

157315 19889 DEI-GISHym19889 *Euura respondens* (Foerster, 1854) adult female 1 Argentina Jujuy Tilcara N 1 km -23.5605, -65.39166 2530 m 2003-10-29 S. M. Blank & C. Kutzscher A. D. Liston SDEI

68077 11605 DEI-GISHym11605 *Euura respondens* (Foerster, 1854) adult female 1 Australia Australian Capital Territory (ACT) Campbell -35.28809, 149.15415 2005-01-11 J. LaSalle S. M. Blank SDEI [KC974368](#)

68097 11629 DEI-GISHym11629 *Euura respondens* (Foerster, 1854) adult female 1 Australia Australian Capital Territory (ACT) Campbell -35.28809, 149.15415 2005-01-11 J. LaSalle S. M. Blank SDEI [KC975344](#)

79967 50135 BC ZSM HYM 01521 *Euura respondens* (Foerster, 1854) adult female 1 Australia Australian Capital Territory (ACT) Campbell -35.28809, 149.15415 2005-01-11 J. LaSalle A. Taeger ZSM [KC975243](#)

49893 3404 DEI-GISHym3404 *Euura respondens* (Foerster, 1854) adult male 1 Austria Austria 47.33333, 13.33333 syntype *Nematus respondens* Foerster, 1854 ZSM

150436 84169 DEI-GISHym84169 *Euura respondens* (Foerster, 1854) adult female 1 Bulgaria Varna Goren Chiflik 43.014, 27.626 30 m 2018-04-13 A. Liston & M. Prous netting M. Prous SDEI [MZ479654](#) [MW939775](#) [MW939866](#)

- 216266 84701 DEI-GISHym84701 *Euura respondens* (Foerster, 1854) adult female 1 Czech Republic Kralovehradecky kraj Bedrichovka 50.3, 16.43333 2009-06-09 J. Macek rearing M. Prous *Salix fragilis* SDEI [MZ479629](#)
- 216268 *Euura respondens* (Foerster, 1854) adult male 1 Czech Republic Bil, Karpaty CHKO Machova res. (potok) 49.25, 17.55 2007-05-18 J. Macek M. Prous SDEI
- 216265 84700 DEI-GISHym84700 *Euura respondens* (Foerster, 1854) adult male 1 Czech Republic Stredocesky Kraj Lazec 49.68333, 13.95 2008-08-17 J. Macek M. Prous SDEI
- 215699 84697 DEI-GISHym84697 *Euura respondens* (Foerster, 1854) adult male 1 Finland Hame Janakkala 60.9, 24.58333 1987-01-01 1987-08-26 J. Kangas rearing M. Prous 1987-08-26 *Salix fragilis* SDEI
- 166483 59331 tO2 *Euura respondens* (Foerster, 1854) adult female 1 Finland Joensuu 2008-08-24 T. Nyman rearing M. Prous 2008-08-30 *Salix fragilis* NIBIO [KF936599](#) [KF935897](#)
- 173521 108268 ZMUO.032710 *Euura respondens* (Foerster, 1854) adult female 1 Finland Karelia borealis: Kitee 62.1109, 30.1708 2017-07-25 Marko Mutanen M. Prous ZMUO [MZ479494](#)
- 173524 108270 ZMUO.032712 *Euura respondens* (Foerster, 1854) adult male 1 Finland Karelia borealis: Kitee 62.1109, 30.1708 2017-07-25 Marko Mutanen M. Prous ZMUO [MZ479614](#) [MW939713](#)
- 173525 108269 ZMUO.032711 *Euura respondens* (Foerster, 1854) adult female 1 Finland Karelia borealis: Kitee 62.1109, 30.1708 2017-07-25 Marko Mutanen M. Prous ZMUO [MZ479384](#)
- 216175 *Euura respondens* (Foerster, 1854) adult male 1 Germany Brandenburg Fuerstenwalde 0000-06-12 rearing M. Prous ZMHB
- 152076 12514 DEI-GISHym12514 *Euura respondens* (Foerster, 1854) adult male 1 Germany Mecklenburg-Vorpommern Neubrandenburg 53.56666, 13.26666 30 m 1895-04-30 M. Prous SDEI
- 133779 80370 DEI-GISHym80370 *Euura respondens* (Foerster, 1854) adult female 1 Greece Elis Kryovrys 37.9191, 21.8041 1000 m 2017-04-26 SDEI Hym-group netting M. Prous SDEI [MZ479547](#) [MW939733](#) [MW939816](#)
- 216267 *Euura respondens* (Foerster, 1854) adult female 1 Slovakia Moravsky Sv. Mikulas 2008-06-12 J. Macek M. Prous ? 2008-07-03 *Salix alba* SDEI
- 155523 88903 DEI-GISHym88903 *Euura respondens* (Foerster, 1854) adult female 1 Sweden Malmoehus Laen Lund 55.7, 13.18333 F. Koch lectotype *Nematus nitens* Thomson, 1888 MZLU
- 216174 *Euura respondens* (Foerster, 1854) adult female 1 Uzbekistan Bakhmal 39.71666, 68.01666 1600 m 1979-05-21 1979-05-23 W. H. Muche M. Prous ZMHB 52078 2826 <http://coll.mfn-berlin.de/u/dbcac9> *Euura respondens* (Foerster, 1854) adult male 1 Uzbekistan Fergana Oblast Fergana 40.38333, 71.76666 1973-05-21 1973-05-23 W. H. Muche holotype *Nematus declaratus* Muche, 1974 ZMHB
- 215629 84686 DEI-GISHym84686 *Euura respondens* (Foerster, 1854) adult female 1 Uzbekistan Fergana 10 km S 40.28, 71.8 1975-05-20 W. H. Muche M. Prous SDEI

- 216172 84694 DEI-GISHym84694 *Euura respondens* (Foerster, 1854) adult male 1 Uzbekistan Fergana 10 km S 40.28, 71.8 1975-05-20 W. H. Muche M. Prous SDEI
- 216173 *Euura respondens* (Foerster, 1854) adult 7 Uzbekistan Fergana 10 km S 40.28, 71.8 1975-05-20 W. H. Muche M. Prous ZMHB
- 216176 111833 <http://coll.mfn-berlin.de/u/111027> *Euura respondens* (Foerster, 1854) adult female 1 Uzbekistan Fergana 10 km S 40.28, 71.8 1975-05-20 W. H. Muche M. Prous ZMHB
- 150058 30223 DEI-GISHym30223 *Euura respondens* (Foerster, 1854) adult male 1 Uzbekistan Taschkent 41.33333, 69.3 Balassoglo M. Prous lectotype *Pteronotus balas-saglo* Jakowlew, 1891 ZIN
- 151299 56528 PR.588VV *Euura reticulata* (Holmgren, 1883) adult female 1 Finland Lapin Laeaeni Pallastunturi 68.1 24 1966-06-15 V. Vikberg V. Vikberg CVV
- 148466 88661 DEI-GISHym88661 *Euura ribesii* (Scopoli, 1763) adult male 1 Germany Brandenburg Eberswalde, Waldstrasse 19: Garten mit Waldrand 52.8264, 13.84136 2017-07-15 2017-07-28 A. Taeger Malaise trap SDEI [MK624714](#) [MK624796](#) [MK624861](#)
- 151354 84243 DEI-GISHym84243 *Euura schlueteri* (Enslin, 1915) adult male 1 Finland Northern Ostrobothnia Oulanka station 18 km SE 66.283, 29.653 150 m 2018-06-02 A. Liston & M. Prous netting M. Prous SDEI [MZ479619](#) [MW939740](#) [MW939847](#)
- 93331 80058 DEI-GISHym80058 *Euura scutellata* (Hartig, 1837) adult male 1 Germany Brandenburg Muencheberg, SDEI 52.515, 14.115 2016-05-05 M. Prous netting M. Prous SDEI [KY698138](#) [KY698265](#) [MK624828](#)
- 148341 88536 DEI-GISHym88536 *Euura spiraeae* (Zaddach, 1883) adult female 1 Germany Brandenburg Eberswalde, Waldstrasse 19: Garten mit Waldrand 52.8264, 13.84136 2017-05-25 2017-06-05 A. Taeger Malaise trap SDEI [MK624715](#) [MK624797](#) [MK624862](#)
- 146883 83744 DEI-GISHym83744 *Euura sylvestris* (Cameron, 1884) larva 1 Austria Nordtirol Hochgurgl, 500 m N, side of Timmelsjoch road 46.90496, 11.05144 2017-08-17 C. Michell & A. Liston M. Prous *Salix hegetschweileri* SDEI [MZ479661](#) [MW939676](#)
- 158316 59158 <http://id.luomus.fi/GL.3493> *Euura sylvestris* (Cameron, 1884) adult female 1 Finland Uusimaa Espoo 60.21666, 24.66666 1964-06-02 J. Perkioemaeki E. Lindqvist holotype *Pteronidea disparoides* Lindqvist, 1969 MZH
- 151659 56564 Prep.310.OR *Euura sylvestris* (Cameron, 1884) adult female 1 Finland Uusimaa Helsinki 60.17555, 24.93416 1963-01-01 1963-12-31 CVV
- 173821 110342 ZMUO.034877 *Euura sylvestris* (Cameron, 1884) adult female 1 Finland Karelia borealis: Kitee: Otravaara 61.8873, 30.1286 2018-06-19 Marko Mutanen M. Prous ZMUO [MZ479599](#)
- 151667 56572 <http://id.luomus.fi/GL.9216> *Euura sylvestris* (Cameron, 1884) adult male 1 Finland Lapin Laeaeni Kilpisjaervi 69.05, 20.8 1968-07-09 L. H. Woollatt M. Prous paratype *Pteronidea woollatti* Lindqvist, 1971 MZH
- 155573 58975 ZMUO.030841 *Euura sylvestris* (Cameron, 1884) adult female 1 Finland Lapland Kilpisjaervi, Saana [767:325] 69.04563, 20.85539 2016-08-14 M. Mutanen, T. Nyman rearing M. Prous *Salix myrsinifolia* ZMUO [MZ479545](#) [MW939726](#) [MW939810](#)

- 166247 59290 GP.97871 *Euura sylvestris* (Cameron, 1884) adult female 1 Finland Kumpula, Botanical garden 60.2016, 24.9607 2016-08-15 2016-08-21 J. Paukkunen Malaise trap M. Prous MZH
- 151292 56521 PR.574VV *Euura sylvestris* (Cameron, 1884) adult female 1 Finland Northern Ostrobothnia Kuusamo [736:60] 66.359, 29.342 1979-07-01 V. Vikberg V. Vikberg CVV
- 175156 111639 ZMUO.036289 *Euura sylvestris* (Cameron, 1884) adult female 1 Finland Lapponia inarensis: Karigasniemi: Suttesjohka 69.3932, 26.1166 2017-07-14 M. Prous ZMUO [MZ479492](#)
- 175360 111044 ZMUO.035596 *Euura sylvestris* (Cameron, 1884) adult female 1 Finland Lapponia inarensis: Utsjoki: Akukoski 69.5874, 25.96 2018-07-04 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen M. Prous ZMUO [MZ479650](#)
- 175703 111102 ZMUO.035654 *Euura sylvestris* (Cameron, 1884) adult male 1 Finland Lapponia inarensis: Utsjoki: Rovisuvanto 69.4703, 25.8635 2018-07-04 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen M. Prous ZMUO [MZ479414](#)
- 175708 111111 ZMUO.035663 *Euura sylvestris* (Cameron, 1884) adult male 1 Finland Lapponia inarensis: Utsjoki: Rovisuvanto 69.4703, 25.8635 2018-07-04 Marko Mutanen, Nestori Mutanen, Anttoni Mutanen M. Prous ZMUO [MZ479655](#)
- 152174 56629 <http://id.luomus.fi/GL.3443> *Euura sylvestris* (Cameron, 1884) adult female 1 Finland Ostrobotnia australis Mustasaari 63.16666, 21.66666 1963-07-24 J. Perkioemaeki E. Lindqvist holotype *Pteronidea angustiserra* Lindqvist, 1969 MZH
- 64947 111965 <http://id.luomus.fi/GL.3512> *Euura sylvestris* (Cameron, 1884) adult female 1 Finland Nurmes 63.55, 29.11666 1939-06-18 A. Saarinen M. Prous ? holotype *Pteronidea straminea* Lindqvist, 1958 MZH
- 176710 111252 ZMUO.035806 *Euura sylvestris* (Cameron, 1884) adult male 1 Finland Ostrobotnia ouluensis: Oulu: Limingantulli 65.0009, 25.4631 2018-06-26 Marko Mutanen M. Prous ZMUO [MZ479472](#)
- 176711 111253 ZMUO.035807 *Euura sylvestris* (Cameron, 1884) adult male 1 Finland Ostrobotnia ouluensis: Oulu: Limingantulli 65.0009, 25.4631 2018-06-26 Marko Mutanen M. Prous ZMUO [MZ479610](#)
- 176712 111254 ZMUO.035808 *Euura sylvestris* (Cameron, 1884) adult male 1 Finland Ostrobotnia ouluensis: Oulu: Limingantulli 65.0009, 25.4631 2018-06-26 Marko Mutanen M. Prous ZMUO [MZ479438](#)
- 217164 111940 ZMUO.041885 *Euura sylvestris* (Cameron, 1884) adult female 1 Finland Ostrobotnia ouluensis: Oulu: Linnanmaa, kasvipuutarha 65.0636, 25.4595 2020-07-08 M. Mutanen rearing M. Prous *Salix pentandra* ZMUO [MZ479606](#) [MW939696](#) [MW939828](#)
- 157558 59131 ZMUO.033783 *Euura sylvestris* (Cameron, 1884) adult female 1 Finland Toppila [65.045N 25.418E] 65.045, 25.418 2017-09-03 M. Mutanen rearing M. Prous *Salix pentandra* ZMUO [MZ479590](#) [MW939693](#)
- 217165 111941 ZMUO.041872 *Euura sylvestris* (Cameron, 1884) adult female 1 Finland Ostrobotnia ouluensis Ulkokrunni [7255:3398] 65.379, 24.817 2019-07-25 M. Mutanen rearing M. Prous *Populus tremula* ZMUO [MZ479488](#) [MW939694](#) [MW939826](#)

217166 111942 ZMUO.041873 *Euura sylvestris* (Cameron, 1884) adult female 1 Finland Ostrobotnia ouluensis Ulkokurunni [7255:3398] 65.379, 24.817 2019-07-25 M. Mutanen rearing M. Prous *Populus tremula* ZMUO [MZ479600 MW939695 MW939827](#)

158211 59151 ZMUO.033416 *Euura sylvestris* (Cameron, 1884) adult male 1 Finland Lapponia inarensis Utsjoki, Nuorgam, Isonkivenvaara [7776:3533] 70.06338, 27.87993 2017-07-07 M. Mutanen, N. Mutanen, A. Mutanen M. Prous ZMUO [MZ479501 MW939692 MW939882](#)

136171 20993 DEI-GISHym20993 *Euura sylvestris* (Cameron, 1884) adult female 1 Lithuania Panevezys Pajiesmeniai 2 km S 56.094, 24.479 35 m 2015-06-08 A.D. Liston & A. Taeger netting M. Prous SDEI [MZ479396](#)

157617 12018 DEI-GISHym12018 *Euura sylvestris* (Cameron, 1884) adult female 1 Sweden Torne Lappmark Abisko 68.349, 18.839 370 m 2016-07-04 A. Liston & M. Prous netting M. Prous SDEI [MZ479578 MW939718 MW939846](#)

96411 21407 DEI-GISHym21407 *Euura sylvestris* (Cameron, 1884) adult female 1 Sweden Torne Lappmark Abisko 6 km E 68.348, 18.969 400 m 2016-07-04 A. Liston & M. Prous netting M. Prous SDEI [MZ479553 MW939761 MW939879](#)

149746 21405 DEI-GISHym21405 *Euura sylvestris* (Cameron, 1884) adult female 1 Sweden Torne Lappmark Abisko 6 km E 68.348, 18.969 400 m 2016-07-04 A. Liston & M. Prous netting M. Prous SDEI [MZ479475 MW939763 MW939872](#)

96483 21376 DEI-GISHym21376 *Euura sylvestris* (Cameron, 1884) adult female 1 Sweden Torne Lappmark Abisko: Mt. Njulla 68.362, 18.73 400 m 950 m 2016-06-30 A. Liston & M. Prous netting M. Prous SDEI [MZ479462 MW939756 MW939868](#)

157483 12008 DEI-GISHym12008 *Euura sylvestris* (Cameron, 1884) adult female 1 Sweden Torne Lappmark Nikkaluokta 7 km NE 67.89, 19.138 500 m 1050 m 2016-07-08 A. Liston & M. Prous netting M. Prous SDEI [MZ479506 MW939739](#)

133762 83594 DEI-GISHym83594 *Euura sylvestris* (Cameron, 1884) adult male 1 Sweden Gotland Roma 57.5, 18.447 2017-06-08 A.D. Liston netting M. Prous SDEI [MZ479560 MW939671 MW939783](#)

96487 21351 DEI-GISHym21351 *Euura sylvestris* (Cameron, 1884) adult female 1 Sweden Torne Lappmark: Abisko Oe 1-5 km SW 68.346, 18.781 350 m 2016-06-25 A.D. Liston netting M. Prous SDEI [MZ479523 MW939762 MW939873](#)

131796 21339 DEI-GISHym21339 *Euura sylvestris* (Cameron, 1884) adult female 1 Sweden Torne Lappmark: Kiruna, near airport 67.84, 20.35 450 m 2016-06-22 A.D. Liston netting M. Prous SDEI [MZ479397 MW939760 MW939871](#)

148499 88694 DEI-GISHym88694 *Euura tibialis* (Newman, 1837) adult female 1 Germany Brandenburg Eberswalde, Waldstrasse 19: Garten mit Waldrand 52.8264, 13.84136 2017-08-27 2017-09-29 A. Taeger Malaise trap SDEI [MZ479646 MW939771 MW939860](#)

78329 15293 DEI-GISHym15293 *Euura vaga* (Fabricius, 1781) adult male 1 Canada Quebec Gatineau Park 1.8 km N Eardley, Juniperus virginiana stand 45.56667, -76.09139 60 m 80 m 2012-05-31 2012-06-07 CNC Hymenoptera Team Malaise trap A. D. Liston SDEI [KF642840 MW939723 MW939823](#)

- 150911 84189 DEI-GISHym84189 *Euura variator* (Ruthe, 1859) adult male 1 Sweden Torne Lappmark Bjoerkilden 68.409, 18.639 500 m 850 m 2016-07-01 A. Liston & M. Prous netting SDEI **MK624671 MK624761 MK624814**
- 148289 88484 DEI-GISHym88484 *Euura vicina* (Serville, 1823) adult male 1 Germany Brandenburg Eberswalde, Waldstrasse 19: Garten mit Waldrand 52.8264, 13.84136 2017-05-18 2017-05-25 A. Taeger Malaise trap SDEI **MZ479639 MW939774 MW939861**
- 157550 12011 DEI-GISHym12011 *Euura viduata* (Zetterstedt, 1838) adult male 1 Germany Brandenburg Muencheberg, Gr. Schlagenthinsee 52.51979, 14.10212 2019-04-04 A. Liston & M. Prous M. Prous SDEI **MZ479502 MW939737 MW939837**
- 158696 12064 DEI-GISHym12064 *Euura villosa* (Thomson, 1863) adult female 1 Norway Finnmark Batsfjord 9 km SW 70.568, 29.554 230 m 2019-06-27 A. Liston & M. Prous netting M. Prous SDEI **MZ479453 MW939744 MW939835**
- 64984 59355 <http://id.luomus.fi/GL.3506> *Euura viridis* (Stephens, 1835) adult female 1 Finland Ahlainen, Rankku 61.61666, 21.56666 1958-07-06 V. Lauro holotype *Pteronidea lauroi* Lindqvist, 1960 MZH
- 215759 84547 DEI-GISHym84547 *Euura viridis* (Stephens, 1835) adult male 1 Finland Lapland Kilpisjaervi, Saana 69.037, 20.844 500 m 900 m 2020-06-29 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI
- 155487 58925 ZMUO.030834 *Euura viridis* (Stephens, 1835) adult male 1 Finland Lapland Kilpisjaervi, Saana [767:325] 69.04563, 20.85539 2016-01-01 2016-12-31 M. Mutanen, T. Nyman rearing M. Prous 2017-01-01 2017-12-31 *Betula pubescens* ZMUO **MZ479647 MW939729 MW939807**
- 155488 58926 ZMUO.030835 *Euura viridis* (Stephens, 1835) adult female 1 Finland Lapland Kilpisjaervi, Saana [767:325] 69.04563, 20.85539 2016-01-01 2016-12-31 M. Mutanen, T. Nyman rearing M. Prous 2017-01-01 2017-12-31 *Betula pubescens* ZMUO **MZ479549 MW939730 MW939808**
- 46497 56552 <http://id.luomus.fi/GL.3441> *Euura viridis* (Stephens, 1835) adult female 1 Finland Kuusamo 65.96666, 29.18333 J. Sahlberg M. Prous holotype *Pteronidea abscondita* Lindqvist, 1949 MZH
- 215760 12603 DEI-GISHym12603 *Euura viridis* (Stephens, 1835) adult male 1 Finland Lapland Lammasoaini 68.778, 21.338 600 m 2020-06-26 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI
- 152418 56757 ZMUO.016327 *Euura viridis* (Stephens, 1835) adult female 1 Finland Muonio 67.8909, 23.7503 2014-07-06 Marko Mutanen M. Prous ? ZMUO **MZ479621**
- 152420 56759 ZMUO.016329 *Euura viridis* (Stephens, 1835) adult female 1 Finland Muonio 67.8909, 23.7503 2014-07-05 Marko Mutanen M. Prous ? ZMUO **MZ479466**
- 152528 56867 ZMUO.028371 *Euura viridis* (Stephens, 1835) adult female 1 Finland Muonio 67.8909, 23.7503 2014-07-01 Marko Mutanen M. Prous ? ZMUO **MZ479521**
- 152510 56849 ZMUO.028326 *Euura viridis* (Stephens, 1835) adult female 1 Finland Poeyrisaervi 68.6743, 23.8834 2015-07-18 Marko Mutanen M. Prous ? ZMUO **MZ479387**

152511 56850 ZMUC.028327 *Euura viridis* (Stephens, 1835) adult female 1 Finland Poeyrisjaervi 68.6743, 23.8834 2015-07-17 Marko Mutanen M. Prous ? ZMUC [MZ479632](#)

152512 56851 ZMUC.028328 *Euura viridis* (Stephens, 1835) adult male 1 Finland Poeyrisjaervi 68.6743, 23.8834 2015-07-18 Marko Mutanen M. Prous ? ZMUC [MZ479635](#)

215666 111829 <http://id.luomus.fi/GL.3461> *Euura viridis* (Stephens, 1835) adult female 1 Finland Utsjoki, Outakoski 69.6, 25.96666 1948-06-24 E. Lindqvist E. Lindqvist holotype *Pteronidea breviseta* Lindqvist, 1949 MZH

51190 3386 DEI-GISHym3386 *Euura viridis* (Stephens, 1835) adult female 1 Germany Nordrhein-Westfalen Aachen Umgebung 50.76666, 6.1 lectotype *Nematus poly-spilus* Foerster, 1854 ZSM

49892 3388 DEI-GISHym3388 *Euura viridis* (Stephens, 1835) adult female 1 Germany Germany 51.5, 10.5 lectotype *Nematus prasinus* Hartig, 1837 ZSM

158841 12150 DEI-GISHym12150 *Euura viridis* (Stephens, 1835) adult male 1 Germany Thueringen Ilfeld: Netzkater: Brandesbachtal 51.6, 10.81 350 m 400 m 2019-05-28 23rd Symphyta Workshop netting M. Prous ? SDEI

80275 50443 BC ZSM HYM 03275 *Euura viridis* (Stephens, 1835) adult male 1 Germany Bayern Ottmaring 49.03499, 11.541 377 m 2006-06-14 J. Hable M. Prous ZSM

149747 21406 DEI-GISHym21406 *Euura viridis* (Stephens, 1835) adult female 1 Sweden Torne Lappmark Abisko 6 km E 68.348, 18.969 400 m 2016-07-04 A. Liston & M. Prous netting M. Prous SDEI [MZ479580](#) [MW939764](#) [MW939874](#)

87277 31131 DEI-GISHym31131 *Euura viridis* (Stephens, 1835) adult female 1 Sweden Norrbottens Laen Abisko National Park 68.342, 18.755 410 m 2012-06-27 A.D. Liston & A. Taeger netting M. Prous SDEI

87288 31142 DEI-GISHym31142 *Euura viridis* (Stephens, 1835) adult female 1 Sweden Norrbottens Laen Abisko National Park, E10 68.353, 18.815 390 m 2012-06-25 A.D. Liston & A. Taeger netting M. Prous ? SDEI

96499 21364 DEI-GISHym21364 *Euura viridis* (Stephens, 1835) adult female 1 Sweden Torne Lappmark: Bjoerkilden 2 km SE 68.395, 18.705 500 m 800 m 2016-06-27 A.D. Liston netting M. Prous SDEI [MZ479564](#) [MW939778](#) [MW939867](#)

216658 111908 B.M.TYP HYM1.697 *Euura viridis* (Stephens, 1835) adult female 1 United Kingdom England London, in the vicinity of Stephens, J. F. holotype *Nematus viridis* Stephens, 1835 BMNH

150434 84172 DEI-GISHym84172 *Euura vittata* (Serville, 1823) adult male 1 Bulgaria Sliven Ichera 3 km SW 42.749, 26.421 730 m 2018-04-14 A. Liston & M. Prous netting M. Prous SDEI [MZ479528](#) [MW939768](#) [MW939880](#)

131794 21330 DEI-GISHym21330 *Euura weiffenbachiella* Liston & Vikberg, 2017 larva 1 Sweden Skane Sandhammen [N55.387 E14.191] 55.387, 14.191 2016-06-14 A.D. Liston photography A. D. Liston *Salix repens* SDEI [MK624680](#) [MK624768](#) [MK624830](#)

149240 83827 DEI-GISHym83827 *Megadineura grandis* (Andre, 1882) adult male 1 Japan Nagano Suzaka 10 km SSW 36.538, 138.295 1350 m 2017-05-30 A. Taeger netting M. Prous SDEI [MZ479658](#) [MW939781](#) [MW939854](#)

- 88820 80015 DEI-GISHym80015 *Mesoneura opaca* (Fabricius, 1775) adult female 1 Morocco Meknes-Tafilat Region Ifrane 7 km NW 33.552, -5.175 1590 m 2015-04-20 A. Liston & M. Prous netting M. Prous SDEI **KY698134 KY698258 MK624823**
- 95621 86259 DEI-GISHym86259 *Nematus* adult male 1 Russia Primorsky Krai Arsenyev, Ski-Base Bodrost 44.122, 133.27 200 m 2016-05-25 K. Kramp, M. Prous & A. Taeger netting M. Prous SDEI **KY698141 KY698261 MK624832**
- 155310 58866 **TUZ109010** *Nematus alniastri* (Scharfenberg, 1805) adult female 1 Estonia Saaremaa Abruka [58.159N 22.501E] 58.159, 22.501 2017-07-25 V. Soon A. D. Liston TUZ **MK624747 MK624805 MK624870**
- 133692 80332 DEI-GISHym80332 *Nematus lucidus* (Panzer, 1801) adult male 1 Greece Achaia Achaiko Chorio S 38.1371, 22.061 1150 m 2017-04-25 SDEI Hym-group netting M. Prous SDEI **MK624685 MK624770 MK624835**
- 89023 31229 DEI-GISHym31229 *Nematus princeps* Zaddach, 1876 adult male 1 Estonia Ida-Virumaa Vasavere 1.5 km E 59.296, 27.543 50 m 2015-06-04 H. Vardal netting M. Prous NHRS **KX602591 KY698262 MK624833**
- 215573 84672 DEI-GISHym84672 *Nematus tulunensis* Vikberg, 1972 larva 1 Finland Northern Ostrobothnia Oulu, kasvipuutarha [7219:3427] 65.06365, 25.45948 2020-06-30 M. Mutanen, M. Prous, A. Liston M. Prous & A. Liston *Lonicera tatarica* SDEI **MZ479567 MW939709 MW939885**
- 87921 31044 DEI-GISHym31044 *Nematus umbratus* Thomson, 1871 adult female 1 Sweden Norrbottens Laen Pajala 67.204, 23.409 150 m 2014-06-05 A. Liston & M. Prous netting A. D. Liston SDEI **MK624710 MK624792 MK624857**
- 216201 84540 DEI-GISHym84540 *Pristiphora astragali* Vikberg, 1978 adult female 1 Finland Lapland Kilpisjäervi, Jehkas 69.086, 20.8 550 m 950 m 2020-06-28 M. Mutanen, M. Prous, A. Liston netting M. Prous & A. Liston SDEI **MZ479477 MW939777 MW939849**
- 94230 80158 DEI-GISHym80158 *Pristiphora cincta* Newman, 1837 adult male 1 Sweden Torne Lappmark Abisko 6 km W 68.342, 18.691 650 m 900 m 2016-07-02 A. Liston & M. Prous netting M. Prous SDEI **KY698066 KY698224 MW939782**
- 133670 80321 DEI-GISHym80321 *Pristiphora cretica* W. Schedl, 1981 adult male 1 Greece Achaia Achaiko Chorio S 38.1371, 22.061 1150 m 2017-04-25 SDEI Hym-group netting M. Prous SDEI **MT385400 MT385404 MT385408**
- 133490 80258 DEI-GISHym80258 *Pristiphora dedeara* Liston & Prous, 2017 adult male 1 Germany Brandenburg Ruhlsdorf bei Strausberg 52.5707, 13.9978 70 m 2017-04-09 A. Liston & M. Prous netting paratype *Pristiphora dedeara* Liston & Prous, 2017 SDEI **MF426918 MF426921 MK624822**
- 150357 88800 DEI-GISHym88800 *Pristiphora fausta* (Hartig, 1837) adult male 1 Bulgaria Varna Staro Oryahovo 2 km SW 42.976, 27.787 120 m 2018-04-08 A. Liston & M. Prous netting M. Prous SDEI **MZ479651 MW939749 MW939865**
- 89815 20989 DEI-GISHym20989 *Pristiphora geniculata* (Hartig, 1840) adult male 1 Estonia Ida-Virumaa Vasavere 1.5 km E [59.29578, 27.54339] 59.29578, 27.54339 50 m 2015-05-19 2015-06-04 M. Heidemaa Malaise trap M. Prous SDEI **KX602585 KY698209 MK624820**

- 157320 12005 DEI-GISHym12005 *Pristiphora gerula* (Konow, 1904) adult male 1 Estonia Tartumaa Tueki [58.4115N 26.5292E] 58.4115, 26.5292 2007-05-26 M. Heidemaa Malaise trap M. Prous CMH [MZ479587](#) [MW939732](#) [MW939881](#)
- 151440 31859 DEI-GISHym31859 *Pristiphora helvetica* (Benson, 1960) adult male 1 Austria Tirol Hochgurgl, Timmelsjochstr. Kehre 3 46.9, 11.05 1900 m 2018-05-26 A.D. Liston netting A. D. Liston SDEI [MK624677](#) [MK624765](#) [MK624818](#)
- 150394 88837 DEI-GISHym88837 *Pristiphora insularis* Rohwer, 1910 adult male 1 Bulgaria Burgas Indzhe Voivoda 3 km NE 42.235, 27.451 250 m 2018-04-12 A. Liston & M. Prous netting M. Prous SDEI [MZ479672](#) [MW939776](#) [MW939864](#)
- 166755 80652 DEI-GISHym80652 *Pristiphora leucopodia* (Hartig, 1837) adult male 1 Russia Primorskiy Kray Anisimovka: Gribanovka 1 km N 43.126, 132.797 450 m 2019-05-08 M. Prous netting M. Prous SDEI [MZ479421](#) [MW939712](#) [MW939796](#)
- 93923 80112 DEI-GISHym80112 *Pristiphora malaisei* (Lindqvist, 1952) adult male 1 Sweden Torne Lappmark Bjoerklidens 68.409, 18.639 500 m 850 m 2016-07-01 A. Liston & M. Prous netting M. Prous SDEI [KY698127](#) [KY698256](#) [MW939852](#)
- 87919 31040 DEI-GISHym31040 *Pristiphora mollis* (Hartig, 1837) adult male 1 Sweden Norrbottens Laen Aengestraesk 3 km N 66.035, 22.16 40 m 2014-05-28 A. Liston & M. Prous netting M. Prous SDEI [KX602587](#) [KY698230](#) [MK624821](#)
- 89566 31311 DEI-GISHym31311 *Pristiphora opaca* Lindqvist, 1955 adult male 1 Sweden Pajala 4 km E (Norrbotten) 67.212, 23.497 170 m 2014-06-10 A. Taeger netting M. Prous SDEI [KX602552](#) [KY698174](#) [MK624808](#)
- 157996 80813 DEI-GISHym80813 *Pristiphora punctifrons* (Thomson, 1871) adult male 1 Russia Primorsky Krai Anisimovka 10 km NW 43.195, 132.665 150 m 2019-05-09 M. Prous & S. Tuerk netting M. Prous SDEI [MZ479605](#) [MW939722](#) [MW939822](#)

Supplementary material I

Studied specimens

Authors: Marko Prous, Andrew Liston, Marko Mutanen

Data type: Excel table

Explanation note: Occurrence data of the studied specimens.

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Link: <https://doi.org/10.3897/jhr.84.68637.suppl1>

Supplementary material 2

Sequence alignments

Authors: Marko Prous, Andrew Liston, Marko Mutanen

Data type: ZIP archive

Explanation note: Alignments used for phylogenetic analyses.

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