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Palaearctic willow-catkin sawflies: a revision of the *amentorum* species group of *Euura* (Hymenoptera, Tenthredinidae)

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Abstract

The *Euura amentorum* species group is Holarctic, and in Europe it is most species-rich in the North. Their larvae develop entirely within the female catkins of *Salix* species: some species bore in the central stalk, whereas others live outside this and feed mainly on the developing seeds. Eight Palaearctic species are treated here as valid, and a key to these is provided. Males of five species are known. Two new species are described from northern Europe: *Euura pohjola* **sp. n.** and *E. ursaminor* **sp. n.** First records of *E. itelmena* (Malaise, 1931) from the West Palaearctic are presented. We propose seven new synonymies: *Pontopristia montana* Lindqvist, 1961 (junior secondary homonym in *Euura*) with *Euura freyja* (Liston, Taeger & Blank, 2009); *Pontopristia brevilabris* Malaise, 1921, *Amauronematus fennicus* Lindqvist, 1944, *Pontopristia boreoalpina* Lindqvist, 1961, *Pontopristia punctulata* Lindqvist, 1961, and *Amauronematus pyrenaeus* Lacourt, 1995 with *Euura microphyes* (Förster, 1854); and *Pteronidea holmgreni* Lindqvist, 1968 with *Nematus umbratus* Thomson, 1871. Lectotypes are designated for: *Amauronematus fennicus* Lindqvist, 1944, *Nematus amentorum* Förster, 1854, *Nematus suavis* Ruthe, 1859, *Pontopristia brevilabris* Malaise, 1921, *Pontopristia itelmena* Malaise, 1931, *Pontopristia kamtchatica* Malaise, 1931, *Pontopristia lapponica* Malaise, 1921, *Pontopristia latiserra* Malaise, 1921, *Pontopristia romani* Malaise, 1921, and *Pristiphora amentorum* var. *nigripleuris* Enslin, 1916. Many new host plant associations are recorded.

Key words: Symphyta, Nematinae, Holarctic, *Salix*, key, taxonomy, hosts

Introduction

The generic placement of the *Euura amentorum* group has undergone several changes. The first species, *E. amentorum* and *E. microphyes*, were described by Förster (1854) in *Nematus*, where most Nematinae species were placed at that time. Konow (1890), followed by Enslin (1916), placed *E. amentorum* in *Pristiphora*. The identity of *E. microphyes* remained unclear, until Lindqvist (1961) treated it as a valid species belonging to the same lineage as *E. amentorum*. Malaise (1921) first recognised that the group contains several species, although he did not realise that *E. amentorum* was one of them. He treated them as belonging to a newly described genus *Pontopristia* Malaise, 1921. Conde (1938) and Benson (1958, 1959) regarded these species as belonging to *Amauronematus*. Conde's (1938) paper is noteworthy because it treated all previously described species as conspecific, as synonyms of a very variable *Am. amentorum*. Lindqvist (1961), in the only revision of the European species before the present one, treated them under the name *Pontopristia*. According to nuclear genetic data, the species treated here form a monophyletic lineage within the large sawfly genus *Euura* Newman, 1837. However, treating the *Euura amentorum* group as a genus separate from *Euura* would result in significant phylogenetic incongruence and paraphyly within

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the other lineages. The wide circumscription of *Euura* proposed by Prous *et al.* (2014) and recapitulated with additional genetic evidence by Prous *et al.* (2019), is the only currently practicable solution to this problem. The alternative, of splitting up *Euura*, would lead to a proliferation of genus-group names for putative lineages which are frequently difficult or impossible to characterise morphologically, and whose phylogenetic relationships are still not clear. This would furthermore cause nomenclatural chaos and instability, as already exemplified by the phylogenetically partly incongruent classification of *Euura* sensu lato in 16 different genera and two additional subgenera proposed by Lacourt (2020).

Representatives of the *Euura amentorum* group are known from throughout northern and mountainous regions of the Holarctic, north of about 43°N in Europe, 39°N in North America, and 53°N in the East Palaearctic. Although Förster (1854) mentioned that his specimens of *Euura amentorum* had been reared from *Salix* catkins, and Conde (1938) provided the first description of a larva, few significant biological data for members of this species group have subsequently been published, apart from a brief presentation of observations by Zinovjev & Vikberg (1998). They are unique among the sawflies, in that the larvae complete their whole development within the catkins of *Salix* species. Only one species occurs regularly in the lowlands of central Europe and is rather uncommon there (note the lack of a mention of *Euura* species in a study of insects inhabiting *Salix* catkins in central Europe by Urban & Kopelke (2004)). However, many additional species occur in northern Europe, and one of these also in the higher mountains of more southern parts of Europe. Specimens were for many years scarce in collections (Lindqvist 1961), but in recent decades many have been reared from larvae. This enables us to present a better assessment of their host plant ranges.

Material and methods

Morphological terminology follows Viitasaari (2002). Names of newly recorded host plant species are marked with an asterisk (*). Specimen labels inscribed PR.[followed by three digits]VV refer to the codes of permanent slide preparations of lances and lancets made by V. Vikberg. These codes are used as unique identifiers. Specimen registration numbers given by the Finnish Museum of Natural History are internet addresses which generally link to additional specimen data and images. Latitude and longitude are in decimal degrees, rounded to three decimal places where longer values are given in electronically archived data or on specimen labels.

Abbreviations for collections:

BMNH	The Natural History Museum, London, United Kingdom
MNHM	Museum National d'Histoire Naturelle, Paris, France
MZH	Finnish Museum of Natural History, Helsinki, Finland
MZLU	Lunds universitet, Zoological Museum, Lund, Sweden
NHMW	Naturhistorisches Museum Wien, Vienna, Austria
NHRS	Naturhistoriska riksmuseet, Stockholm, Sweden
NIBIO	Norwegian Institute of Bioeconomy Research, Svanvik, Norway
SDEI	Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany
USNM	National Museum of Natural History, Washington D.C., USA
VVT	private collection Veli Vikberg, Turenki, Finland
ZMHB	Naturkundemuseum, Berlin, Germany
ZMUO	Zoological Museum, University of Oulu, Finland
ZSM	Zoologische Staatssammlung, Munich, Germany

Infested catkins were identified in the field by the presence of white "fluff" (silky hairs that normally aid in seed dispersal), which is expelled from the seed capsules by the larvae during feeding (Fig. 20A–B) and usually accompanied by wilting and subsequent desiccation of the apical part of catkins for stalk-boring species (Fig. 20C). We note that very similar signs of infestation are also produced by catkin-feeding *Egle* flies (Michelsen 2009) or catkin-boring moths (Nyman 2023), but that sawfly larvae can be readily separated from these based on morphology.

For rearing, we detached the catkins containing larvae from the shoots on which they were growing. Infested catkins were placed on the surface of a layer of *Sphagnum* moss covering a layer of sand in containers kept in a climatized room or rearing chambers. Nyman kept the containers at 1°C until around mid March to early April, when the temperature was raised to 7–8°C for a week, and the containers then taken to room temperature. The adults start to emerge within about a week.

Rearings were not always successful, particularly in the case of stalk-boring larvae. Two main problems were encountered: prepupae often began to wander around in the jars and refused to pupate, or if large numbers of catkins were kept together in one container, mould killed many larvae and prepupae. As a solution, when E. O. Peltonen and Vikberg reared *E. latiserra*, they offered prepupae short pieces of cut *Rubus idaeus* stems in which to spin their cocoons. A cavity was made with forceps in one end of the cut stem through which prepupae willingly burrowed deeper into the stem. The stems were then removed and kept individually. This also worked well with other species of the *amentorum* group. Nyman tried a different approach: wandering prepupae were placed individually in 1.5 ml Eppendorf tubes, with a pierced lid, that contained a small piece of tightly rolled tissue paper. This usually led to successful pupation inside the paper roll and emergence of adults. It seems that either of these methods adequately solves both problems and that it is better to keep only a small number of catkins in a container.

Genetic methods

For species delimitation and association of sexes, one mitochondrial and four nuclear gene fragments were used. The mitochondrial fragment is cytochrome c oxidase subunit I (COI) and the nuclear fragments are sodium/potassium-transporting ATPase subunit alpha (NaK), 6-phosphogluconate dehydrogenase (PGD), DNA dependent RNA polymerase II subunit RPB1 (POL2), and triose-phosphate isomerase (TPI). DNA was sequenced using Sanger (see Prous *et al.* 2019) or R10.3 flow cells of Oxford Nanopore Technologies (see Liston *et al.* 2022). Additional primers used in this study, but not mentioned in Prous *et al.* (2019) are listed in Table 1. Some COI sequences (DNA barcodes) were generated in the Centre for Biodiversity Genomics, Guelph, Canada using both Sanger and SEQUEL platforms (deWaard *et al.* 2008, Hebert *et al.* 2018), some of which have already been published (Schmidt *et al.* 2017, Roslin *et al.* 2022). The newly obtained DNA sequences have been submitted to NCBI GenBank (accessions OP886482–OP886657, OP901178–OP901194, OQ075786–OQ075927). Additional sequences were obtained from GenBank or BOLD (http://www.boldsystems.org/). Maximum likelihood trees were built with IQ-TREE 1.6.12 (Nguyen *et al.* 2015) and genetic p-distances (proportion of nucleotide differences) were calculated in R with the package ape (Paradis and Schliep 2019). Short introns of POL2, PGD, and TPI were excluded from the phylogenetic analyses and distance calculations because of uncertainties in sequence alignment. Unless otherwise stated, distance calculations are based on European specimens. COI distances are based on the full or nearly full barcode region (620–658 bp) and nuclear distances based on at least 997 bp of NaK or 1529 bp NaK and POL2. Two maximum likelihood analyses were performed: one based on concatenated nuclear (NaK, PGD, POL2, and TPI) sequences, and one based on COI only. For the unpartitioned nuclear dataset (Fig. 1) the best-fit model chosen according to Bayesian information criterion was TIM2+F+R2, and for the unpartitioned COI dataset (Fig. 2) it was TPM2u+F+R3. More complex mixture models (partitioning the datasets by gene and / or codon position) were not tested because of the small divergence (less than 10%) of the analysed sequences. The low divergence of the sequences was indicated also by the models selected for the unpartitioned datasets which were not the most complex. We used a SH-like approximate likelihood-ratio test (SH-aLRT; Guindon *et al.* 2010) and ultra-fast bootstrap (Hoang *et al.* 2017) implemented in IQ-TREE to assess branch support of the estimated maximum likelihood trees.

Due to apparent heteroplasmy, multiple COI variants were detected in some specimens. The most abundant variant in the Nanopore sequencing results was considered to be the main variant and selected for GenBank submission (GenBank does not allow submission of multiple sequences for the same locus and specimen). The COI distance calculations for each species were done in two ways: minor intraindividual COI variants (i.e. not the most abundant in Nanopore sequencing results) excluded or included.

For simplicity, identical sequences were excluded from the phylogenetic analyses with a few exceptions in case of COI. To demonstrate the diversity of intraindividual variants of COI, all variants of some specimens were included even if the minor COI variants were identical to sequences of other specimens.

TABLE 1. Primers used for PCR and Sanger sequencing, with information provided on primer name, direction (forward, F or reverse, R), primer sequence, and reference. Primer annealing temperature used in PCR was 55 °C. Additional primers used for COI, NaK, and POL2 are listed in Prous *et al.* (2019).

Primer name	F/R	Primer sequence 5′–3′	Reference
PGD326F	F	GAYGGNGGNAAYTCNGARTAYCA	This study
PGD527F	F	GARCCNTGYTGYGANTGGGTIGG	This study
PGD556R	R	CCRTAYTCDATNCCRTTRTGNACCAT	This study
PGD_hym_intRb	R	ATRATRCANCCDCCYCKCCACAT	Malm and Nyman (2015)
TPI35F	F	AARTTYTTYGTNGGNGGNAAYTGGAA	This study
TPI706Rv2	R	GCRTTNACNATYTGNACRAARTCNGGYTT	This study

Results

Diagnosis of the group

Imagos. Body length 2.75–6.00 mm. Ovipositor sheath (valvifers 2 + valvulae 3) in lateral view usually angled upwards at about 45° to longitudinal axis of abdomen (Figs 4D, 5F). In dorsal view, valvulae 3 subparallel-sided (Fig. 5E) or distally widened (Figs 4B, 6D), and apically more or less truncate (Fig. 7F) or tridentate (Fig. 5E). Eye in frontal view long-suboval; inner edge slightly concave (Figs 3I–J, 9D). Ventral margin of clypeus medially from subtruncate (Figs 3I, 11D) to slightly emarginate (Figs 3J, 9D). Antennal hollows (Figs 4A, 8B) deep and densely setose. Frontal area in dorsal view broad and wide, projecting beyond eyes (Figs 4A, 8B). Malar space about as long as diameter of a torulus (Fig. 9D). Antennal flagellum hardly tapered towards the apex in the female (Figs 3D, 11E), but slightly tapered in the males of some species (Figs 3K, 11J); flagellomere 1 clearly shorter than 2 (Fig. 3D, K). Fore wing (Figs 3A, 11I) vein 2r present, and 2r-rs absent; costal vein moderately widened distally. Inner (longer) metatibial spur at most 1.2 × as long as greatest apical width of metatibia (Fig. 11K). Tarsal claws (Fig. 11K) with well-developed inner tooth, slightly shorter than external tooth; the teeth subparallel, and close to each other, separated apically by approximately the basal width of a tooth. Plantar lobes minute; on tarsomeres 2–4 little longer than the longest setae on tarsus (Fig. 11K). All terga of abdomen more or less dull (Fig. 12A–C), with areolate-rugulose surface sculpture (sensu Harris 1979). Lance (Figs 4C, 7C) very much higher than lancet (Figs 14A–C, 16E–F). Lancet usually lacking ctenidial teeth on the annular sutures of the lamnium (Figs 14–16): only *E. dahlbomi* has a few small ctenidial teeth on some basal annular sutures (Fig. 17).

In their small body size and predominantly dark colouration, imagos of the *Euura amentorum* group resemble numerous other *Euura* species belonging to various groups, as well as some *Pristiphora* species. Most female *amentorum* group specimens are distinguishable from these by their strongly upwardly orientated sawsheath. The truncate or tridentate shape of the valvulae 3 in dorsal view also distinguishes them from the majority of other *Euura*, such as the *viduata* group and the gall-makers, in which the valvulae 3 mostly taper towards a more or less acute or narrowly rounded apex. However, in dorsal view the valvulae 3 are strongly reminiscent of some *Pristiphora* species with medially carinate and apically deeply emarginate valvulae, such as *P. pallidiventris* (Fallén), but in most *Pristiphora* the costal vein is apically wider, the angle between veins R and R1 more gently curved, and the inner tooth of tarsal claw shorter. Separation of males of the *amentorum* group from other small *Euura* specimens using morphological characters is highly challenging, and at present probably only possible by examination of their penis valves.

Larvae and prepupae. [Based mainly on *E. amentorum*: see under that species for additional details].

Thorax caudally narrowed (Figs 20D, 21A). Dorsum of metathorax with protruding ridges (Fig. 20D) [but less well developed than on dorsum of abdomen]. Head relatively small (Figs 20D–E, 21F). Antenna flat; all antennomeres incomplete (Fig. 20F). Abdominal segments 2–8 with 5 dorsal annulets (Fig. 21B). Annulets 2 and 3 upwardly protruding (Figs 20D, 21B), forming transverse ridges. Annulets 2–4 with setae (Fig. 21B). Suranal plate without pseudocerci (Fig. 21C).

The fully fed larva undergoes an extra moult to the prepupal stage (see Viitasaari 2002), and these stages can differ conspicuously from each other, particularly in coloration and setation. Under rearing conditions, the prepupae remained in the catkin for some time after the previous moult.

In the majority of characters, larvae of the *amentorum* group most closely resemble those of the species of *Euura* that were formerly placed in *Amauronematus*. The larvae examined and described by Lorenz & Kraus (1957) as *Amauronematus* species are all exophytic leaf-feeders; they were unable to examine a larva belonging to the *amentorum* group. The larvae of the exophytic species differ from the *amentorum* group in: Abdominal segments 2–8 with 6 dorsal annulets; usually 4 annulets with setae; annulets 2 and 3 not raised dorsally above the others. Conde (1938) thought that the protruding ridges on the dorsum of the abdomen (annulets 2 and 3) assist larvae of the *amentorum* group in moving through the dense tangle of fluff within the catkin. Perhaps these ridges do aid locomotion, but they are also present in the stalk-boring larvae, and may therefore be a more general adaptation of the *amentorum* group to their endophytic way of life.

Behavioural traits

Larvae of the *Euura amentorum* group have been found feeding only in female *Salix* catkins. Two types of larval feeding have been recognised (Zinovjev & Vikberg 1998):

1) species whose larvae move around within the pistils, ovaries and bracts, and feed mainly (or possibly exclusively) on the developing seeds. This habit was first described by Conde (1938) for *Euura amentorum*, but is provisionally thought to be similar in *E. dahlbomi*, *E. latiserra*, *E. microphyes*, and *E. ursaminor* **n. sp.** Observations on how *E. itelmena* feeds are inconclusive. At least in *E. amentorum*, several larvae (up to about 20) may inhabit the same catkin. Larvae sometimes temporarily leave the catkin (Fig. 20A), presumably to find a fresh feeding site. It is likely that they sometimes move to a different catkin after exhausting the one in which they first fed, particularly when the catkins of the host are extremely small, as in *Salix herbacea* and *S. polaris*. The prepupae leave the catkin to find an overwintering site. Catkins containing larvae prematurely release the white fluff which was attached to the seeds (Fig. 20A–B), and the catkin and the ejected fluff contains pellets of faeces. Catkins fed on by *Egle* Robineau-Desvoidy species (Diptera, Anthomyiidae) show similar signs (Michelsen 2009), but their larvae do not defecate during their development, and therefore catkins infested only by these do not contain faeces. Frequently, however, larvae of *Egle* occur together with those of the *E. amentorum* group in the same catkin.

2) species whose larvae bore within the central stalk of the catkin (Fig. 21E). This habit was first described by Zinovjev & Vikberg (1998) for *E. freyja* (under the name *Pontopristia analis*), and larvae of *E. pohjola* **n. sp.** are also now known to feed in this way. The larvae of these species are usually solitary (only one per catkin). Affected catkins usually wilt, then desiccate starting at the tip, where some fluff is released (Fig. 20C). At least sometimes, larvae of both *E. freyja* and *E. pohjola* **n. sp.** make a cocoon within the catkin stalk and overwinter therein. Observations on how *E. itelmena* feeds are inconclusive.

Note that specimens of the *Euura viduata* species group have occasionally been reared from *Salix* catkins (Mutanen, personal observations). It seems likely that their prepupae entered the catkins to overwinter, rather than having developed there as larvae. In a similar way, it is probable that the two specimens of *E. dahlbomi* reared by Vikberg from leaf-folds of a *Euura* species on *Salix glauca* had only used the leaf-folds as a place to spin their cocoons and overwinter.

Vikberg observed oviposition by a female *Euura amentorum* (PR.263VV) captured on *Salix caprea*. In an experiment she laid eggs on *S. caprea* and *S. phylicifolia*. Oviposition was into the ovaries: the end of the abdomen was placed on the upper part of an ovary (the special form of sawsheath is suited for that), the ovipositor was inserted, and an egg laid. This did not take long. One egg was found in the cavity of an ovary after oviposition.

Imagos of many different sawfly taxa, including females of the *Euura amentorum* group (Benson 1959), can be seen feeding from both female and male catkins of *Salix*. When the sawfly's head is repeatedly tucked between the flower parts, and the apex of the abdomen points more or less outwards, it can be assumed that they are consuming nectar from the gland located at the base of each flower (nectar glands are present in both male and female *Salix* catkins). Benson (1959) explicitly stated that females of *E. amentorum* consume both nectar and pollen. When ovipositing into female catkins, the head points away from the catkin and the abdomen is submerged in it. Sawflies also eat pollen from the stamens of male inflorescences. During such activity the head and body remain outside the main body of the catkin. Although numerous pollen grains adhere to many female *amentorum* group imagos netted in the field, which indicates that they regularly feed at male *Salix* catkins, pollen has not been found on the very few available netted males. Indeed, it is not known whether males of the *amentorum* group feed at all.

Association of the sexes

The primary types of all nominal species are female. Males of most species are rare or rarely collected, or are not known at all (Benson 1959, Beneš 1962). Particularly Benson (1959) and Lindqvist (1961) described some male specimens under the names of species previously only known in the female sex. It is often not clear how they reached the conclusion that these males are conspecific with the respective females. Vikberg (1982) has already pointed out that the supposed males of three *Pontopristia* species described by Lindqvist (1961) do not belong to the *Euura amentorum* group. DNA analyses, as used in this study, offer the best prospect of achieving a reliable association of the sexes. Males are known of five of the eight species treated by us as valid.

Character states

Lindqvist (1961) had already concluded that few species of the *Euura amentorum* group can be distinguished from each other using external characters, and that examination of the genitalia is essential for accurate determination. Generally, our studies lead us to agree with his statement.

Body size. Lindqvist (1961) used body length in his characterisation of species of the *Euura amentorum* group. For example, he stated that his *Pontopristia analis* is the largest species, and *P. microphyes* the smallest. Having now been able to examine a greater number of specimens than were available to him, we find that although there are some more or less clear tendencies in this character, the size ranges of many species overlap significantly. Furthermore, conditions during rearing can greatly affect the size of the imagos that are obtained. In 1970 Erkki O. Peltonen and Vikberg reared *Euura latiserra* from larvae collected at the same site: Norway, Helligskogen. Peltonen reared 11 females with body length varying from 4.3–4.9 mm, whereas Vikberg reared 39 females of 3.2–4.2 mm. In Vikberg's opinion, the difference was entirely due to the better rearing techniques employed by Peltonen. The largest specimen of an *E. amentorum* group species examined, at 6 mm body length, is a female of *E. pohjola* (ZMUO.037222). Amongst the smallest specimens are *E. ursaminor* (2.75–3.00 mm), reared from *Salix polaris*, and some individuals of *E. microphyes* reared from *Salix herbacea* and *S. reticulata*. Species found mainly, or so far only, on *Salix lanata* are largest, i.e. *E. freyja*, *E. latiserra* and *E. pohjola.* The catkins of *Salix herbacea* and *S. polaris* are minute, whereas the catkins of *S. lanata* are extremely large. This suggests a rough correlation between the size of the catkins of the host and the average body size of imagos.

Body shape. The overall proportions of the body look normal (Figs 3A, 5A, 7A) in most species of the *amentorum* group, i.e. similar to most other *Euura* species, such as the *E. mucronata* group. *Euura freyja* females are exceptional in that the body is clearly more elongate (Fig. 6A) than in other *amentorum* group species, making the overall shape reminiscent of species in the *E. atra* group. This character is difficult to quantify, but can be assessed by comparing measurements of selected parts of the thorax, e.g. the length / breadth ratio of a lateral mesoscutal lobe, or length of the median mesoscutal lobe compared to length of the mesoscutellum.

Colour. Lindqvist (1961) used colour characters, including colour of the wing venation, to distinguish some species. While in a few cases helpful colour differences do exist, he underestimated the variability in some species, particularly in *Euura freyja*. Furthermore, differences between species in pterostigma and vein colour are often clear only in relatively fresh, well-preserved specimens.

Head shape. The studied specimens of all species except *E. pohjola* have a similarly shaped head: in dorsal view strongly contracted and short behind the eyes (Figs 3G–H, 5B, 7D, 9C). In *E. pohjola*, particularly the female (Fig. 11C), the head at first widens behind the eyes and narrows more gradually posteriorly, and is longer.

Labrum. Malaise (1921) attached great significance to the proportions of the labrum, this being the main character proposed to distinguish his *Pontopristia brevilabris* [*E. microphyes*] from the other species. He wrote [translated from German] "Labrum [of *brevilabris*] short, not longer than the clypeus. (Fig. 47.)". His fig. 47 indeed depicts the labrum, with a truncate ventral edge, as about as long as the clypeus. For comparison, as in his fig. 41, he illustrated the clypeus and labrum of *Pontopristia suavis* var. *fusca* [*E. dahlbomi*], in which the labrum is much longer than the length of the clypeus, but again with a truncate ventral edge. Among all the *Euura amentorum* group specimens which we have studied, only the lectotype of *Pontopristia brevilabris* (Fig. 9D) and the possible paralectotype of *P. brevilabris* (NHRS-HEVA000006331) have the labrum shaped and proportioned as in his fig. 47 (although the labrum of the paralectotype appears somewhat longer). However, on close examination, the lower part of the labrum of the lectotype can be seen to be folded sharply inwards, and this nearly hidden lower part is rounded. Among all the other species represented by more than a few specimens, we also noted a high degree of apparent variability in both the shape and length of the labrum. Frequently, it appears to be asymmetrical (e.g. Fig.

3I). We suspect that some real variability is present, but that this appears much more extreme in dried specimens than is naturally the case, perhaps caused by a combination of distortion, variable degree of overlap by the clypeus, and the position of the mandibles. In short, we do not consider the proportions or shape of the labrum to be useful species characters in this group of *Euura*.

Lancet. We agree with Lindqvist (1961), that the most reliable characters for identification of species in this group are found on the lancet. At the same time, his suggestion that the examination of only the distal parts of the lamnium is sufficient, is misleading. Interspecific differences in the shape and distribution of the saw teeth are often not large (with the exception of *E. dahlbomi*), while the proportions of the whole lancet (or at least the lamnium) may show much clearer differences, e.g. the short, high lancet of *E. microphyes* (Fig. 15C–E) compared with the long, low lancet of *E. ursaminor* (Fig. 15A–B). The number of annulets can be used to separate some species, but seems to be more variable than stated by Lindqvist (1961). Not previously noted, but probably of taxonomic value, is the degree of development of a lobe projecting from the anterior edge of the tangium (Fig. 14A). In view of the value of lancet characters, it is highly regrettable that the lancets of several type specimens are very badly damaged, incomplete, or entirely missing. The lancets of a few specimens (Fig. 15B, E) display some atypical characters. In these cases, the left and right lancet of the same individual differ from one another, in that individual annular sutures are obsolete, partly obsolete, or irregularly formed. Corresponding irregularities may occur in the length of annuli and the form of the saw teeth. Generally, examination of a slide preparation of the lancet is recommended for determination, because the usually small interspecific differences can be easily misinterpreted if the lancet is not visible in a single plane.

Penis valve. The usefulness of penis valve characters for determination varies strongly between the species. The penis valves of *E. amentorum* (Fig. 18A) and *E. pohjola* **n. sp.** (Fig. 18B) are distinctive not only within the *E. amentorum* group, but also compared with other *Euura* species. On the other hand, the penis valves of *E. dahlbomi* (Fig. 18C), *E. freyja* (Fig. 18E–F) and *E. microphyes* (Fig. 18D) are so similar to each other that they are not always clearly distinguishable. They also resemble the penis valves of several other *Euura* species, particularly members of the *flavescens* and *bipartita* groups (Fig. 19).

Tergum 8 of male. We have seen too few male specimens to be able to conclusively judge whether the structure of tergum 8 might be useful for identification. However, in the seven males of *E. pohjola* available for study, the range of variability was extreme (Fig. 12A–C). In this species, the tergal hollows may be hardly developed, or deep and extend anteriorly almost to the base of the tergum, and the posterior part varies from completely sclerotised (black), to extensively unsclerotised (pale). The perceived shape of the procidentia varies accordingly, from subtriangular to rectangular. Furthermore, the procidentia sometimes appears to project strongly beyond the posterior edge of the tergum, and in other specimens barely projects at all. Structure of this tergum also varied considerably between three examined males of *E. amentorum*.

Mesepisternum. Malaise (1921) already noted variability in the sculpture of the mesepisternum. In the description of *Pontopristia suavis* var. *fusca* [*E. dahlbomi*] he wrote "Mesonotum kaum und Mesopleuren nicht punktiert" [Mesonotum scarcely, and mesopleura not punctate] and of *P. brevilabris* [*E. microphyes*] he wrote "Mesopleuren im oberen Teil schwach runzlig punktiert, glänzend" [Upper part of mesopleura weakly wrinkled-punctate, shiny]. Lindqvist (1961: 77–78) thought that only *P. punctulata* [*E. microphyes*] sometimes has more strongly sculptured mesopleura (describing these as "punktiert"), but also acknowledged that this is variable in that species, and that some individuals are nearly impunctate. Among the specimens which we studied, only a few specimens of *E. microphyes*, including the holotype of *P. punctulata*, and a single female of *E. dahlbomi* (Fig. 5D) have strongly sculptured upper parts of the mesepisterna. This character apparently varies within some species, and should therefore not be accorded too much importance.

Valvulae 3 (sawsheath). The ovipositor is usually orientated strongly upward (Figs 4D, 5F), although less so in some specimens of *E. pohjola* **n. sp.** In dorsal view, this results in very different impressions of the shape of the valvulae 3, depending on whether these are examined at a viewing angle nearly perpendicular to the body axis (as generally employed for other sawflies), or at an angle nearly perpendicular to the upper edge of the valvula. We found the latter to be more informative, and this is adopted here as a convention (including the illustrations). The clearest impression of their shape is sometimes gained by viewing from below. The distal width of the valvulae 3 is compared here, as a convention, with the narrowest distal width of the metatibia (the metatibia is strongly laterally compressed).

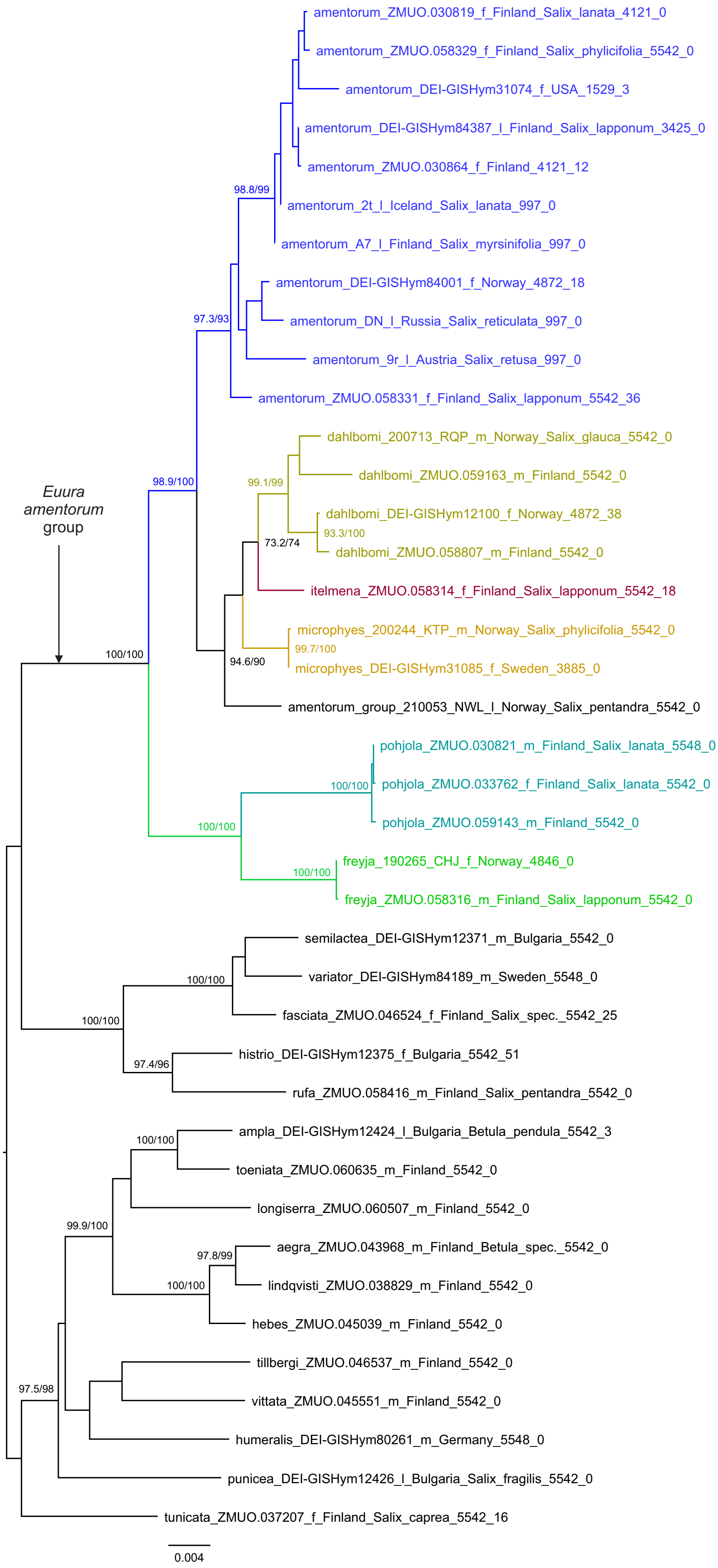

FIGURE 1. Maximum likelihood tree based on combined nuclear (NaK, PGD, POL2, and TPI) sequences. Numbers at the branches are support values (%) in the order SH-aLRT/ultra-fast bootstrap. Support values less than 90% are not shown. The numbers at the end of specimen names refer to the number of nucleotides available and number of heterozygous positions.

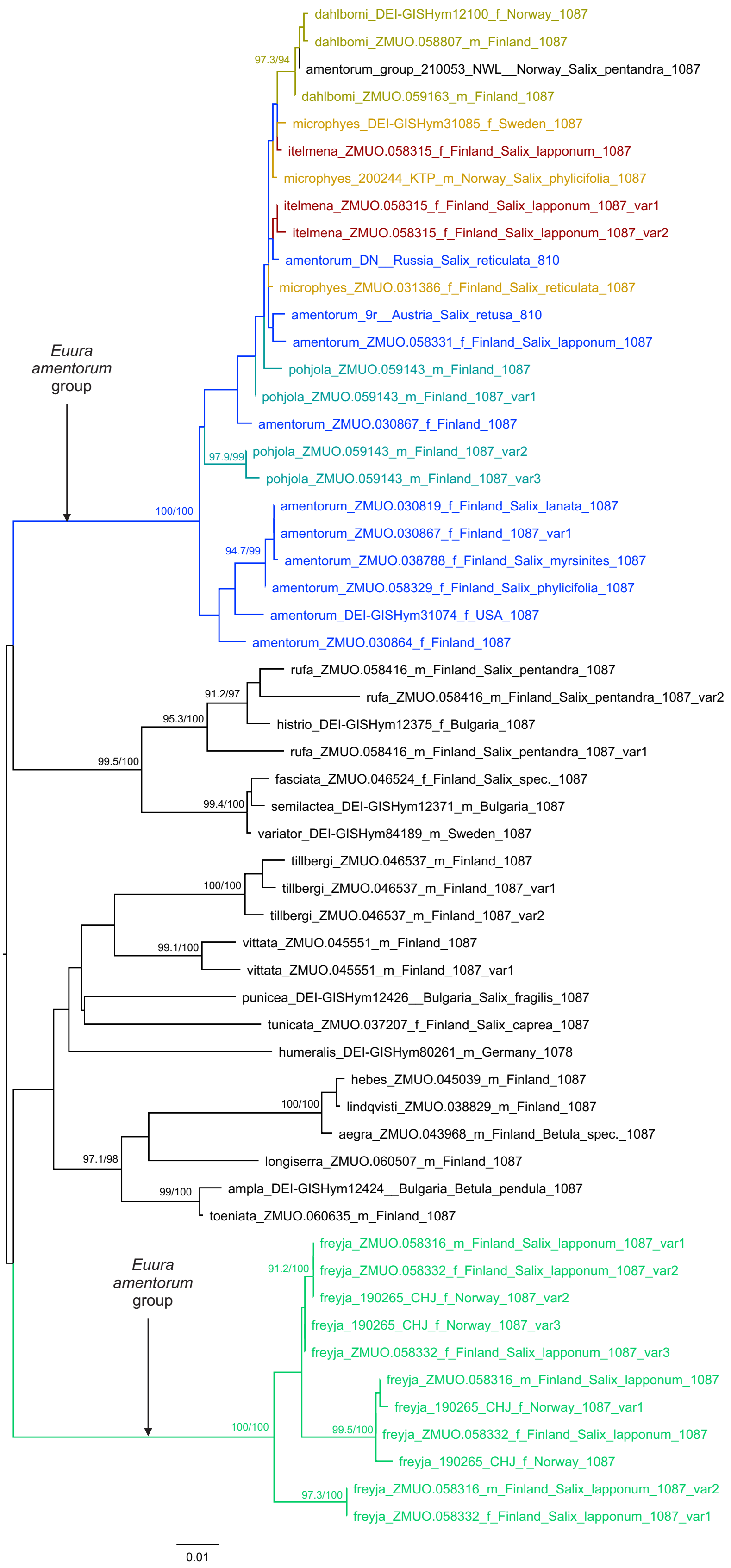

FIGURE 2. Maximum likelihood tree based on at least 810 bp of mitochondrial COI sequences. Numbers at the branches are support values (%) in the order SH-aLRT test/ultrafast bootstrap. Support values less than 90% are not shown. The numbers at the end of specimen names refer to the number of nucleotides available. Where appropriate, additional intraindividual variants are marked with “var”.

Phylogeny of the *Euura amentorum* group

Within *Euura*, the *amentorum* group (former "*Pontopristia*") belongs to a clade containing most of the former "*Amauronematus*" (see fig. 3 in Prous *et al.* 2014), here referred to as the *E. punicea* group *sensu lato*. Nuclear data strongly supports the *Euura amentorum* group and all the sampled species as monophyletic (Fig. 1). Three strongly supported clades above species level can be identified. The catkin stalk-borers *E. freyja* and *E. pohjola* form a clade that is the sister group to the other *amentorum* group species. *Euura amentorum* is sister to the clade containing the remaining species (unidentified species from *Salix pentandra*, *E. microphyes*, *E. itelmena*, and *E. dahlbomi*). The larval feeding habit of *E. itelmena* is unknown, but this species is notably nested within the clade of external catkin feeders. Based on current data, it is not clear whether stalk-boring is ancestral in the *amentorum* group, or arose within it.

Within *E. amentorum*, there is a strongly supported clade containing specimens from a wide geographic area and associated with a wide spectrum of willows, which may be separate species from the other sequenced specimens (possibly restricted to arctic and montane regions). All the palest specimens appear to belong only to this strongly supported clade, but the colour variability overlaps with the other *E. amentorum* outside this clade. The mitochondrial COI phylogeny (Fig. 2) contradicts the nuclear phylogeny to a remarkable degree. Only *E. freyja* is monophyletic based on COI, but surprisingly it does not cluster with the other species of the group, although the relationships at the base of the *punicea* group are poorly resolved. Like in the *Euura bergmanni* group (Prous *et al.* 2021), there is evidence for widespread mitochondrial heteroplasmy in the *amentorum* group (Fig. 2), with up to four different variants per individual, and with a maximum distance of 3.3% between intraindividual variants (in *E. freyja*). Other *E. punicea* group s.l. species can also have heteroplasmic variants (Fig. 2). All the COI variants seem to be functional, because there are no stop codons and no frame shifting insertions or deletions.

Key to Palaearctic species of the *Euura amentorum* group

1 a One or more of following partly or completely pale: malar space, supraclypeal area, pronotum, mesepisternum (Fig. 3C, F, J) . . . . . . **E. amentorum** pale form ♀♂ [see also couplet 5, dark form ♀]

- aa Malar space, supraclypeal area, pronotum, and mesepisternum entirely black (Fig. 3B, I) **2**

2 a Females **3**

- aa Males **11**

3 a Head in dorsal view behind eyes hardly narrowed, and long (length behind eye 0.65–0.80 × length of an eye) (Fig. 11C, F). [Additional characters: Fore wing pterostigma dark, at least on edges (Fig. 11A). Valvulae 3 in dorsal view scarcely widened distally (Fig. 11G)] . . . . . . ***E. pohjola* n. sp.** ♀

- aa Head in dorsal view behind eyes strongly narrowed, and short (length behind eye 0.3–0.6 × length of an eye) (Figs 3G, 9C). **4**

4 a Body slimmer (Fig. 6A): lateral mesoscutal lobe approximately 2 × as long as greatest width.
b Valvulae 3 in lateral view tapering less strongly; apically subtruncate.
c Fore wing pterostigma usually dark (Fig. 6A–B)
[Valvulae 3 in dorsal view strongly widened distally (Fig. 6D); 1.8–2.0 × as wide as narrowest distal width of metatibia] . . . . . . ***E. freyja*** ♀

- aa Body stouter (Figs 3A, 5A, 7A): lateral mesocutal lobe 1.33–1.70 × as long as greatest width.
bb Valvulae 3 in lateral view tapering strongly; apically rounded (Figs 4D, 13H).
cc Fore wing pterostigma dark or largely pale **5**

5 a In dorsal view valvulae 3 1.8–2.1 × as wide as narrowest distal width of metatibia, strongly widened towards tip (Fig. 4B). [Base of tangium with distinct lobe-like extension (Fig. 14A–B)] . . . . . . ***E. amentorum*** dark form ♀

- aa In dorsal view valvulae 3 0.9–1.7 × as wide as narrowest distal width of metatibia, subparallel-sided or only slightly widened towards tip. [Base of tangium with (Fig. 14D) or without (Fig. 15A–B) lobe-like extension] **6**

6 a Fore wing stigma and costa dark.
b Profile of valvulae 3 in dorsal view barrel-like: widened from the base to about the middle, then gently narrowing to the tip [ca. 1.0–1.1 × as wide as narrowest distal width of metatibia] . . . . . . ***E. itelmena*** ♀

- aa Fore wing stigma and costa mainly pale.
bb In dorsal view valvulae 3 widened from base to a point close to the tip [0.9–1.7 × as wide as narrowest distal width of metatibia]. **7**

7 a Approximately basal half of lamnium of lancet, except first and second annulus, without serrulae, and basal annular sutures with ctenidial teeth (Fig. 17) [16–19 annular sutures] . . . . . . ***E. dahlbomi*** ♀

- aa Each annulus of lamnium with a serrula, and no ctenidial teeth on annular sutures (Figs 14D–E, 15A–E) [15–21 annular sutures] **8**

8 a Lancet high compared to its length, with 15–16 annular sutures (Fig. 15C–E). . . . . . . ***E. microphyes*** ♀

- aa Lancet low compared to its length, with 17–21 annular sutures (Figs 14D–E, 15A–B) **9**
9 a Each serrula of lancet, except on annuli 1 and 2, with pronounced caudal lobe [look particularly at medial annuli of lamnium] (Fig. 15A–B).
b Base of tangium without clearly developed lobe (Fig. 15A–B).
c Body length 2.75–3.00 mm . . . . ***E. ursaminor* n. sp.** ♀
- aa Medial and basal serrulae of lancet flatter, without pronounced lobes (Fig. 14D–E).
bb Base of tangium with prominent, narrow lobe (Fig. 14D).
cc Body length 3.2–5.4 mm . . . . ***E. latiserra*** ♀
10 a Head behind eyes in dorsal view only slightly narrowing, and longer (Fig. 12D).
b Penis valve with large distally projecting lobe below valvispina (Fig. 18B)
[Fore wing costa and stigma greyish (Fig. 11A). Sternum 9 slightly paler than other sterna]. . . . . ***E. pohjola* n. sp.** ♂
- aa Head behind eyes in dorsal view strongly narrowing, and shorter (Fig. 10B).
bb Penis valve with small distally projecting lobe below valvispina, or lobe absent (Fig. 18C–F) **11**
11 a Fore wing stigma pale (Fig. 5G).
b Paravalva below valvispina narrow (Fig. 18C) . . . . ***E. dahlbomi*** ♂
- aa Fore wing stigma dark (Figs 6E–F, 10A).
bb Paravalva below valvispina wide (Fig. 18D–F). **12**
12 a At most abdominal sternum 9 pale.
b Valvispina basally narrower (Fig. 18D) . . . . ***E. microphyes*** ♂
- aa Sternum 9 pale, and also partly 6 and 7.
bb Valvispina basally wider (Fig. 18E–F). . . . . ***E. freyja*** ♂

Species treatments

Euura amentorum **(Förster, 1854)**

Figures 3, 4, 14A–C, 18A, 20B, D–F, 21A–C

Nematus amentorum Förster, 1854: 332–334. Described: syntypes, 5♀. Published type locality: Gegend von Crefeld [Germany, Krefeld area]. Lectotype designated below.
Pristiphora amentorum: Konow, 1905; Enslin 1916.
Amauronematus amentorum: Conde, 1938.
Pontopristia amentorum: Lindqvist, 1953.
Amauronematus (*Pontopristia*) *amentorum*: Liston, 1995.
Euura amentorum: Prous *et al.*, 2014.
Nematus (*Pontopristia*) *amentorum*: Zhelohovcev, 1988.
Nematus suavis Ruthe, 1859: 308. Described: syntypes, 2♀ (NHMW, examined). Published type locality: Island [Iceland]. Lectotype designated below. Synonymy with *amentorum* by Lindqvist (1961).
Amauronematus suavis: Konow, 1901.
Pontopristia suavis: Malaise, 1921.
Nematus laevigatus Zaddach, 1883 [in Brischke 1883]: 194–195. Described: holotype ♀ (probably destroyed). Published type locality: not stated.
Pontania atra Marlatt, 1896: 24 (key), 37. Described: holotype ♀ (USNM, examined). Published type locality: Michigan [probably East Lansing, Michigan [USA]: Zinovjev & Smith 1999]. Secondary homonym in *Euura* of *E. atra* (Jurine, 1807). Synonymy with *amentorum* by Conde (1938).
Pontania maura Rohwer, 1908: 47. Described: syntype(s), ♀ (USNM, not examined). Published type locality: Florissant, Colorado [USA]. Synonymy with *amentorum* by Conde (1938).
Pontania amentivora Rohwer, 1915: 209. Described: syntypes, 4♀ (USNM, not examined). Published type locality: Falls Church, Virginia [USA]. Synonymy with *amentorum* by Conde (1938).
Amauronematus amentivorus: Benson, 1960a.
Pristiphora amentorum var. *nigripleuris* Enslin, 1916: 528 (key), 533. Described: syntypes, ♀ (ZSM, examined). Published type locality: not stated. Lectotype designated below.
Pontopristia kamtchatica Malaise, 1931: 53–54. Described: syntypes, 9♀. Published type locality: Klutchi, Petropawlowsk and Nischne-Kamtchatsk (See Aszabatch [Lake Azhabachye]) [Russia, Kamchatka]. Lectotype designated below. Synonymy with *amentorum* by Benson (1962).
Nematus (*Pontopristia*) *kamtchaticus*: Zhelohovcev, 1988

Diagnosis. Female: Specimens with pale interantennal area, outer orbit, pronotum, and parts of mesepisternum (Fig. 3C, J), are easily distinguished from all the other species, in which these parts are entirely black. Dark *E. amentorum* specimens differ from all other species, except *E. freyja*, in the distally wider valvulae 3, in dorsal view 1.8–2.1 × as wide as narrowest distal width of metatibia (at most 1.6 × as wide in other species). *E. amentorum* differs from *E. freyja* in its largely pale forewing stigma and costa (blackish in *E. freyja*) and stouter body shape.

FIGURE 3. *Euura amentorum*. A–B) ♀ ZMUO.030865. C) ♀ ZMUO.030864. D) ♀ DEI-GISHym4851. E–F) ♂ http://id.luomus.fi/GP.118189. G) ♀ DEI-GISHym13881. H) ♀ lectotype *Pontopristia kamtchatica* NHRS-HEVA000006355. I) ♀ ZMUO.030865. J) ♀ DEI-GISHym4851. K) ♂ DEI-GISHym12665. Scale bars 1 mm.

FIGURE 4. *Euura amentorum*. A) ♂ DEI-GISHym12665. B) ♀ valvulae 3 dorsal lectotype *Pontopristia kamtchatica* NHRS-HEVA000006355. C) ♀ lance PR.506VV. D) ♀ valvula 3 lateral DEI-GISHym13881. E) ♂ tergum 8 DEI-GISHym12665. F) ♂ tergum 8 http://id.luomus.fi/GP.110189.

Male: So far, only pale coloured males are known, which differ from other *amentorum* group males in their pale malar space, interantennal area, pronotum, and part of mesepisternum (Fig. 3F, K). Penis valve (Fig. 18A): The apical extension of pseudoceps is much longer than that of any other known male in the *amentorum* group, and in this respect resembles only a few other *Euura* species: *E. abnormis* (Holmgren), *E. cornuta* (Lindqvist), and *E. longicauda* (Hellén).

Description. Female. Length 3.5–5.5 mm. Black. Pale are at least more or less mandibles, palps, labrum, tibiae, and apices of femora. Cerci pale. Wing veins including fore wing pterostigma and costa pale (Fig. 3A); margins of stigma sometimes darker.

Head. In dorsal view moderately contracted behind eyes, and length posterior of eye about 0.40 × length of eye (Fig. 3G–H). Mostly dull with coriaceous sculpture except for labrum. Upper head densely setose; setae pale, about 0.7 × as long as anterior ocellus diameter. Clypeus subtruncate to slightly emarginate medially, labrum apically rounded (Fig. 3I–J). Antenna (Fig. 3D) 0.95–1.10 × as long as fore wing costa (Fig. 3A).

Thorax. Pronotum, tegula and mesoscutum densely punctate, dull. Mesoscutum sparsely punctate, with shiny interspaces. Vestiture similar to upper head, but shorter, adpressed. Lateral mesoscutal lobe approximately 1.50 × as long as greatest width. Mesoscutellum as broad as long, without longitudinal median furrow; with few, extremely weak punctures; smooth and shiny, to dull with fine sculpture. Mesepisternum smooth, shiny; without a ventral glabrous patch; setae about 1.0 × as long as diameter of anterior ocellus.

Abdomen. Valvulae 3 in lateral view clearly orientated upwards; apically narrow, rounded (Fig. 4D). In dorsal view 1.8–2.1 × as wide as narrowest distal width of metatibia, strongly expanding towards tip (Fig. 4B). Cercus reaches approximately to the tip of valvulae 3. Lancet (Fig. 14A–C): 16–19 [most frequently 17] annular sutures; moderately curved; lamnium with rather flat marginal serrulae; basal annular sutures without ctenidial teeth. Base of tangium with prominent, narrow lobe.

Male [three specimens examined, all from Finland]. Length 3.5–4.5 mm. All are extensively pale-coloured (Fig 3F). Antenna (Fig. 3K) 1.05–1.10 × as long as fore wing costa; slightly tapering towards apex. Abdominal tergum 8 (Fig. 4E–F): posterior edge of procidentia subrectangular to rounded, tergal hollows reach almost to base of tergum. Penis valve (Fig. 18A): Extension of pseudoceps longer than height of paravalva; paravalva upper surface almost flat.

Variability. Colour pattern of females highly variable. The palest European females (e.g. Fig. 3C, H, J) have pale scape, pedicel, underside of base of flagellum, whole face below top of toruli including clypeus and labrum, outer orbit, temple, nearly whole pronotum, whole tegula, central parts and / or underside of mesepisternum, legs except for tarsi and extreme base of coxae, all abdominal sterna, broad lateral parts of terga, cercus, and sawsheath. The darkest specimens (e.g. Fig. 3A–B, G, I) have only the following pale: apices of femora; base, apex and underside of tibiae, cercus. Pale specimens occur apparently throughout the species' European range, but the very dark specimens are only known from subarctic and arctic regions. The extant type series of four female *P. kamtchatica* exhibits colour variability comparable to the European material: the lectotype is the palest and largest (5.5 mm), and NHRS-HEVA000006353 is the darkest and smallest (4.5mm). The size and shape of the lancet serrulae are also somewhat variable in both European specimens and those from Kamtchatka (Fig. 14A–C). Lindqvist (1961) wrote that the lancet of *E. amentorum* has 18 annular sutures, but we found this to be rather variable: 16–19 sutures in 75 examined specimens. So far, only males with extensive pale markings are known. Two of these (http://id.luomus.fi/GP.110189 (Fig. 3E–F), DEI-GISHym12665), have entirely pale hind legs, and are thus even paler than the palest females. Sclerotisation of tergum 8 (Fig. 4E–F) is highly variable, and the apparent outline of the procidentia varies correspondingly.

Genetic data

COI. Specimens are spread among three BINs, BOLD:ACJ5901, BOLD:ACJ5900, and BOLD:ACJ5782, all of which are present in Europe. BINs BOLD:ACJ5900 and BOLD:ACJ5782 seem to contain only *E. amentorum*, but BOLD:ACJ5901 contains all *amentorum* group species, except *E. freyja* (BOLD:ACG1728). Based on 24 specimens, maximum within species distance is 2.74% and the nearest neighbour, diverging by a minimum of 0.15%, is *E. microphyes*. The nearest neighbour, diverging by a minimum of 0%, is *E. itelmena* when considering all of its intraindividual COI variants. If Nearctic specimens are included, the maximum within species distance is 2.89%. The single sequenced male (http://id.luomus.fi/GP.110189) with 563 bp of COI belongs to BOLD:ACJ5900 and is identical to several female specimens collected from *Salix myrsinifolia*, *S. lapponum*, and *S. lanata* (e.g. ZMUO.030819).

Nuclear. Based on 16 specimens, maximum within species distance is 1.94% (0.65% based on haplotypes of individual females). The nearest neighbour, diverging by a minimum of 0.79%, is *E. microphyes*. The maximum within species distance of 1.94% is based only on 568 bp of overlapping NaK sequence, so that the presence of additional species cannot be excluded. If only specimens sequenced for all nuclear genes are included (four specimens, but representing both of the main clusters in Fig. 1), maximum within species distance is 0.64%.

Biology. Host plants: The very wide distribution of *Euura amentorum* already indicates that it must use several *Salix* species as hosts. Apparently reliably recorded hosts are *Salix aurita* (Macek *et al.* 2020), *S. caprea* (Pschorn-Walcher & Altenhofer 2000), *S. glauca* (Humble 2006), *S. lanata** (see records under Finland, below), *S. lapponum** (see records under Finland, below), *S. myrsinites* (Benson 1959), *S. phylicifolia** (see records under Finland, below), *S. repens* (Kasparyan & Kopelke 2010), and *S. starkeana** (see record under Finland, below). A few larvae found in catkins of *S. hastata* and *S. myrtilloides* were probably also *E. amentorum*.

Larva and prepupa: based mainly on a final instar larva (DEI-GISHym84386) and a prepupa (DEI-GISHym84387) of *E. amentorum* from the same catkin, determined using gene sequences, as well as field and rearing notes by Vikberg on larvae of *E. amentorum* on *Salix lapponum*, from Finland, North Karelia, Kontiolahti, Venejoki, marshy area, 12.6.1969.

Final instar larva (Figs 20E, 21A–C): Head nearly entirely black (Fig. 21A), only labrum and clypeus partly paler. Legs largely black; only coxa apically and most of trochanter pale (Fig. 21A). Ground colour of trunk pale green (Fig. 20E). Cuticle extensively spinulate and thus rather matt. Spiracles dark. Dorsal and lateral setae on thorax partly in groups arising from larger dark areas, especially on the prothorax (Fig. 21A). Abdominal segments 3–8 with setae arising individually from small dark flecks (Fig. 21B). Annulet 2 with 6 setae, annulet 3 with 8–12, annulet 4 with 4 (Fig. 21B). Substigmal lobe with 2–3 setae, suprapedal lobe with 2–4 (Fig. 21B). Suranal plate mainly dark (Fig. 21C). Width of head in five specimens 0.90–0.97 mm and body length approximately 9.5–10.5 mm [bodies curved with dorsum convex].

Prepupa (Figs 20E–F): Head largely pale yellow-brown; upper head with numerous small brownish flecks and a diffuse brownish stripe above the stemmatum; stemmatum in a black patch; frons brown; mandibles apically darkened (Fig. 20F). Legs largely pale, with a few small dark markings (Fig. 20F). Ground colour of trunk pale brown (Fig. 20E). Cuticle nearly smooth and thus rather shiny. Setae on head and abdominal segment 10 much as in final instar larva, but particularly on abdominal segments 3–8 greatly reduced in length and often no longer visible. The clearly defined dark markings on the trunk of the final instar larva are replaced by larger but more diffuse darker areas (Fig. 20E). Width of head in two specimens 1.05–1.06 mm; body length slightly shorter than final instar larva.

Distribution. Central and northern Europe, including Iceland; East Palaearctic, Nearctic (including Greenland: Benson 1962). Specimens determined as *E. amentorum* from Svalbard (e.g. Vikberg 1973) should be re-examined.

Type material examined

Nematus amentorum. Lectotype ♀, hereby designated: GBIF-GISHym3193, ZSM. According to the original description, reared from catkins of *Salix* sp. Type locality: Germany, Krefeld area. Paralectotype: 1♀, same data as lectotype, ZSM.

Nematus suavis. Lectotype ♀, hereby designated: DEI-GISHym12675, NHMW. Type locality: Island [Iceland]. Paralectotype: 1♀ (DEI-GISHym12674), same data as lectotype, but with labels “Staudg, Island 1861”, “coactulus det. Ruthe”, “PR.482VV” [code of microscope slide of lancets prepared by Veli Vikberg], NHMW. The date “1861” on one of the labels is disconcerting, because the specimens described by Ruthe were collected in 1856, as mentioned in the original description, and the description was published in 1859. Nevertheless, this specimen seems likely to be the second syntype. The label referring to *Nematus coactulus* Ruthe, 1859, a taxon described from Iceland in the same paper as *N. suavis*, has certainly been attached to the specimen by mistake: the original description of *N. coactulus* disagrees in many characters from the paralectotype of *N. suavis*. The two *N. suavis* types are closely similar, and represent a rather pale form of *Euura amentorum*. As described by Ruthe (1859) in considerable detail, pale are the labrum and clypeus, lateral areas of the lower face, outer orbit (obscurely), posterior edge of pronotum, tegula, hypopygium, valvifer 2, and more or less terga 9 and 10. The lancet tips of the lectotype were found to have been broken off and glued to a card pinned to the specimen. The basal parts of the lancets and lances remain in situ. The lancets and lances of the paralectotype (Fig. 14B) are preserved intact on a permanent slide preparation made by Vikberg.

Pontania atra. Holotype ♀, USNMENT00778430, USNM (http://n2t.net/ark:/65665/34b34f456-67c4-4094-a859-e5c426a24322). Type locality: USA, Michigan, Ingham, Agricultural College. “Ag. Coll. Mich. 4-21 90 62”, “Davis”, “Type ♀”, “Type No. 1916 U.S.N.M”, “Pontania atra ♀ nsp.”.

Pristiphora amentorum var. *nigripleuris*. Lectotype ♀, hereby designated: GBIF-GISHym3363, Erlangen [Germany, Bavaria], leg. Stöckhert, ZSM.

Pontopristia kamtchatica. Lectotype ♀, hereby designated: “NHRS-HEVA000006355”, “R.M.prep. 7023”, “Riksmuseum Stockholm”, “15172”, “4460”, “kamtschatica”, “PR.484VV”, “Pontopristia kamtchatica Malaise Typus”, “KAMTSCHATKA Malaise”, “Typus”, “833”, “LECTOTYPE ♀ Pontopristia kamtchatica Malaise, 1931 des. Liston 2018”, NHRS. Paralectotypes: 3♀; NHRS-HEVA000006353 (PR.481VV), NHRS-HEVA000006354 (PR.483VV), NHRS-HEVA000006356, with other labels similar to lectotype.

Other specimens examined

Finland: 1♂ (http://id.luomus.fi/GP.110193), Helsingin pitäjä, 30.04.1959, leg. O. Ranin (MZH). 1♀ (PR.490VV), Helsingin pitäjä, 30.04.1959, leg. O. Ranin (VVT). 1♀ (PR.489VV), Utsjoki kk, 15.06.1960, leg. V. Vikberg (VVT). 1♂ (http://id.luomus.fi/GP.110189), KemL, Pallastunturi, 13.06.1967, leg. V. Vikberg (MZH).

1♀ (PR.518VV), Leutsuvaara, 68.911°N 20.981°E, ovipositing on female catkin of *S. lapponum*, 16.06.1967, leg. V. Vikberg (VVT). 1♀ (PR.500VV), Joensuu, ex larva *Salix phylicifolia*, 05.1967, leg. V. Vikberg (VVT). 1♀ (PR.263VV), Joensuu, 21.05.1967, captured on *Salix caprea* and used for oviposition experiments, leg. Vikberg (VVT). 1♀ (PR.520VV), Karelia borealis, Pielisjärvi, 63.30°N 30.05°E, 10.06.1968, reared ex "*Salix depressa*" [=*starkeana*], leg. V. Vikberg (VVT). 1♀ (PR.501VV), Lapin Lääni, Pallastunturi, 02.07.1968, ex larva *Salix lapponum*, leg. V. Vikberg (VVT). 1♀ (PR.506VV), Kontiolahti, K99/69VV, *S. phylicifolia*, V. Vikberg (VVT). 1♀ (PR.505VV), Leutsuvaara, 24.06.1973, ovpositing on *Salix lapponum*, leg. V. Vikberg (VVT). 1♂ (DEI-GISHym12665), Helsinki, reared ex *Salix caprea*, em. 16.02.1980, leg. E. O. Peltonen (MZH). 1♀ (DEI-GISHym19626), N Vihti, Metsäpellontie, 60.42°N 24.33°E, 19.05.2012, leg. I. Kakko (SDEI). 6♀ (including ZMUO.030865), Li, Utsjoki, Nuorgam, 7776:3533, larva in *Salix lanata* catkin, 07.07.2017, rearing 56/2017, leg. M. Mutanen, N. Mutanen & A. Mutanen (ZMUO). 2♀ (including ZMUO.030819), Lapponia inarensis, Utsjoki, Nuorgam, Isonkivenvaara [7776:3533], 70.063°N 27.880°E, 07.07.2017, reared from *Salix lanata*, rearing 101/2018, leg. M. Mutanen, N. Mutanen & A. Mutanen (ZMUO). 1♀ (ZMUO.030862), Kuusamo, Putaanoja [7367:3608], 66.380°N 29.426°E, 13.06.2017, M. Mutanen (ZMUO). 1♀ (ZMUO.030863), same data as preceding (ZMUO). 1♀ (ZMUO.030864), Kuusamo, Jäkälämutka [7357:3617], 66.287°N 29.618°E, 10.06.2017, leg. M. Mutanen (ZMUO). 1♀ (ZMUO.030867), Kuusamo, Pulkkajaervi [7333:3596]; 66.079°N 29.132°E, 11.06.2017, leg. M. Mutanen (ZMUO). 28♀, Kuusamo, Tammenjänka, 7367:3611, larva 07.06.2018 in catkin of *Salix lapponum*, rearing 14/2018, leg. A. Liston, M. Mutanen & M. Prous (ZMUO). 2 larvae (DEI-GISHym84386, DEI-GISHym84387), Lapland, Tolva 7 km W, 330–450 m, 66.223°N 28.552°E, 09.06.2018, in catkins *Salix lapponum*, leg. SDEI Hym-group (SDEI). 28♀, Kuusamo, Posio Riisisuo, 7349:3569, larvae 09.06.2018 in catkins of *Salix lapponum*, rearing 17/2018, leg. A. Liston, M. Mutanen & M. Prous (ZMUO). 29♀, Kuusamo, Juhtivaara, 7360:3617, larva 11.06.2018 in catkin of *Salix phylicifolia*, rearing 15/2018, leg. A. Liston, M. Mutanen & M. Prous (ZMUO). 30♀ (including ZMUO.037168, ZMUO.038788), Kuusamo, Korvasvaara region, 7365:3616, larva 12.06.2018 in catkin of *Salix myrsinites*, rearing 18/2018, leg. A. Liston, M. Mutanen & M. Prous (ZMUO). 3♀ (ZMUO.058328–330), Le Enontekio, Annjaloanji 7686:3279 la., 12.07.2020, host *Salix phylicifolia*, rearing 54/2020, leg. A. Liston, M. Mutanen & M. Prous (ZMUO). 16♀ (ZMUO.058296–312), Le Enontekio, Leutsuvaara 7660:3256 la. 27.06.2020, leg. Liston, Mutanen & Prous, host *Salix glauca*, rearing 24/2020 (ZMUO). 1♀ (ZMUO.058313), Le Enontekio, Leutsuvaara 7660:3256 la. 27.06.2020, leg. Liston, Mutanen & Prous, host *Salix lanata*, rearing 25/2020 (ZMUO). 1♀ (ZMUO.058331), Le Enontekiö, Doskalharji (7688:3282), la. 12.07.2020, leg. M. Mutanen, *Salix lapponum*, rearing 55/2020 (ZMUO).

France: 2♀ (DEI-GISHym4851, DEI-GISHym18782), Auvergne, Foret de Peyre-Levade, 1170m, 45.00°N 1.52°E, 19.05.2008, leg. A. Liston (SDEI).

Germany: 1♀, no data, Coll. Konow (SDEI). 1♀, [Erzgebirge], Coll. Lange (SDEI). 1♀, Saxony, [?]Hardt, 18.04.[18]86, Coll. Konow (SDEI). 1♀, Brandenburg, Fürstenberg i. M. [Fürstenberg/Havel], 53.18°N 13.17°E, 19.05.[18]87, leg. F. W. Konow (SDEI). 1♀, Brandenburg, Fürstenberg i. M. [Fürstenberg/Havel], 53.18°N 13.17°E, 05.[18]92, leg. F.W.Konow (SDEI). 1♀, Baden-Württemberg, Federseegebiet, Bad Buchau, 585m, 48.05°N 9.65°E, 05.05.2016, leg. SDEI (SDEI).

Norway: 1♀ (PR.487VV), Helligskogen, ex larva *Salix lapponum*, em. 14.02.1971, E. O. Peltonen (VVT). 2♀ (DEI-GISHym84000, DEI-GISHym84001), Finnmark, Båtsfjord 9 km SW, 70.568°N 29.544°E, 230m, 27.06.2019, leg. A. Liston & M. Prous (SDEI). 1♀ (200397_GSC), Finnmark, Svanvik, NIBIO Svanhovd, 09.07.2019, reared from *Salix lapponum*, leg. T. Nyman (NIBIO). 1♀ (200582_ALX); same data as preceding. 1♀ (200221_YXR), Finnmark, Svanvik, NIBIO Svanhovd, 12.07.2019, reared from *Salix myrsinites*, leg. T. Nyman (NIBIO). 1♀ (200227_NQI), Finnmark, Svanvik, Sametiveien, 10.07.2019, reared from *Salix phylicifolia*, leg. T. Nyman (NIBIO).

Sweden: 1♀, Skåne, Malmö, Limhamns Kalkbrott, 55.57°N 12.93°E, 23.04–10.05.2009 leg. B.W.Svensson & Co, Malaise Trap (MZLU). 1♀, data as previous, except: 29.02–30.03.2012. 1♀, Norrbotten, Kalix, Pålänge, 50 m, 65.82°N 22.98°E, 26.05.2014, leg. A. Liston & M. Prous (SDEI). 1♀, Norrbotten, Överkalix 22 km W, 140 m, 66.30°N 22.36°E, 02.06.2014, leg. A. Liston & M. Prous (SDEI). 1♀, Lule Lappmark, Gällivare Dundred, 67.105°N 20.641°E, 450m, 11.06.2014, leg. A. Liston & M. Prous (SDEI).

Switzerland: 1♀, Bern, Limpach, 47.11°N 7.50°E, 30.04.1987, leg. P. Duelli (SDEI).

USA: 1♀ (DEI-GISHym31074), California, South Lake Tahoe S 15 km, Grass Lake, 2350m, 38.80°N 119.97°W, 01.05.2013, leg. S. M. Blank & C. Kutzscher (SDEI).

Euura dahlbomi (Thomson, 1871)

Figures 5, 17, 18C

Nematus dahlbomi Thomson, 1871: 134–135. Described: syntypes, ♀. Published type locality: Lappland. Lectotype (examined) designation by Lindqvist (1954).
Amauronematus dahlbomi: Konow, 1890.
Nematus dahlbomii: de Dalla Torre, 1894; misspelling.
Pontopristia dahlbomi: Lindqvist, 1961.
Nematus (*Pontopristia*) *dahlbomi*: Zhelohovcev, 1988.
Amauronematus (*Pontopristia*) *dahlbomi*: Liston, 1995.
Euura dahlbomi: Goulet & Bennett, 2021.
Pontopristia lapponica Malaise, 1921: 14. Described: syntypes, 8♀, 2♂. Published type locality [as comment under *P. romani*, p. 14]: Vassijaure, Lappland [Sweden, Vassijaure]. Lectotype designated below. Synonymy with *suavis* var. *fusca* by Conde (1938). Synonymy with *dahlbomi* by Lindqvist (1961).
Pontopristia suavis var. *fusca* Malaise, 1921: 12–13. Described: syntypes, 7♀, 2♂ (?NHRS, not located). Published type locality: Vassijaure, Lapland [Sweden, Vassijaure]. Synonymy with *N. dahlbomi* by Lindqvist (1954).

Diagnosis. Female: The lancet of this species is highly distinctive, with marginal serrulae developed only on the first and second annuli and the apical half of the lamnium, and some ctenidia visible on the basal annular sutures (Fig. 17A–B).

Male: So far, this is the only *amentorum* group male, apart from that of *E. amentorum*, with a pale fore wing costa and stigma (Fig. 5G). The male of *E. amentorum* differs in its very long extension of pseudoceps (Fig. 18A), and paler colouration of head and body (Fig. 3E–F). The penis valve strongly resembles those of *E. freyja* (Fig. 18 E–F) and *E. microphyes* (Fig. 18D), but *E. dahlbomi* has edge of paravalva below the valvispina less strongly downward-deflected.

Description. Female (Fig. 5A). Length 3.5–4.0 mm. Black. Pale are more or less mandibles, palps, labrum, tibiae, apices of femora. Cerci pale. Wing veins including fore wing pterostigma pale.

Head (Fig. 5B). In dorsal view moderately contracted behind eyes, and length posterior of eye about 0.50–0.60 × length of eye. Mostly dull with coriaceous sculpture except for labrum. Upper head densely setose; setae pale, about 0.7 × as long as anterior ocellus diameter. Clypeus slightly emarginate medially. Labrum apically rounded. Antenna 0.94–1.0 × as long as fore wing costa.

Thorax. Pronotum, mesoscutum and tegula densely punctate with small shiny interspaces; vestiture similar to upper head, adpressed. Lateral mesoscutal lobe approximately 1.60 × as long as greatest width. Mesoscutellum as broad as long, without longitudinal median furrow; with few, extremely weak punctures; smooth and shiny. Upper half of mesepisternum usually smooth, shiny (Fig. 5C); with small ventral glabrous patch; setae about 0.5 × as long as diameter of anterior ocellus.

Abdomen. Valvulae 3 in lateral view (Fig. 5F) clearly orientated upwards; tapering to the narrowly rounded tip. In dorsal view (Fig. 5E) subparallel-sided, gently widened before tip, 1.0–1.1 × as wide as narrowest distal width of metatibia. Cercus reaches approximately to the tip of valvulae 3. Lancet (Fig. 17A–B): 16–19 annular sutures; strongly curved (lower edge concave); approximately basal half of lamnium without marginal serrulae, distal half with rather flat serrulae; basal annular sutures with ctenidial teeth; a lobe present at anterior of tangium.

Male [based on 4 specimens]. Length 3.7 mm. As female, except: Antenna 1.2–1.3 × as long as fore wing costa. Abdomen black except for pale cerci, and more or less sternum 9. Tergum 8: tergal hollows narrow, fully sclerotised. Procidentia subrectangular, projecting clearly beyond posterior tergal edge by slightly less than its distal width, becoming a narrow carina (without the sculpture of the adjacent areas) towards anterior. Penis valve (Fig. 18C): Valvispina short, basally narrow; edge of paravalva below the valvispina only slightly downward-deflected; lobe on paravalva below valvispina small or absent.

Variability. Upper half of mesepisternum sometimes with coriaceous sculpture, dull (Fig. 5D).

Genetic data

COI. Specimens belong to BIN BOLD:ACJ5901, which includes all *amentorum* group species, except *E. freyja* (BOLD:ACG1728). Based on 10 specimens, maximum within species distance is 0.94% and the nearest neighbour, diverging by a minimum of 0%, are unidentified larvae collected from *Salix pentandra* (e.g. 210053_NWL).

Nuclear. Based on 4 specimens, maximum within species distance is 0.88% (0.78% based on haplotypes of individual females). The nearest neighbour, diverging by a minimum of 0.46%, is *E. microphyes*.

Biology. Host plants: *Salix glauca** (see records below), *S. lapponum** (see record under Finland, below).

Distribution. Europe: northern Norway, Sweden, Finland, and Russia. East Palaearctic: Russia, Yamal Peninsula. Canada: Yukon Territory, and Manitoba (Goulet & Bennett 2021). As far as we are aware, the records below from Russia and the East Palaearctic are the first for that country and region.

FIGURE 5. *Euura dahlbomi*. A–C) ♀ lectotype DEI-GISHym31948. D) ♀ mesepisternum DEI-GISHym12100. E) ♀ valvulae 3 dorsal DEI-GISHym20977. F) ♀ valvula 3 lateral DEI-GISHym20977. G) ♂ http://id.luomus.fi/GP.110190. Scale bars 1 mm.

Type material examined

Nematus dahlbomi. Lectotype ♀: “DEI-GISHym31948”, “MZLU 2017 308” [green], “Dahlbomi”, “Ths” [Thomson], “Lpl.” [Lapland], “Lectotype ♀ Nematus dahlbomi Thomson, 1871 designated E. Lindqvist 1954, teste A. Liston” [red, handwritten], MZLU.

Pontopristia lapponica. Lectotype ♀, hereby designated: "NHRS-HEVA000003676", "Vassijaure N. Lappland", "ARn" [A. Roman], "Roman", "Pontopristia lapponica **n. sp.** Malaise det 1920", "Paratypus", "Lectotype Pontopr. lapponica Mal. A. Haris 2003", NHRS. Paralectotypes: 2♀ (NHRS-HEVA000003677, NHRS-HEVA000003678), with labels similar to lectotype (NHRS).

Taxonomic note. The drawing of part of the lancet of *P. suavis* var. *fusca* by Malaise (1921, fig. 47), with marginal serrulae only developed on a few apical annulets, clearly indicates that this taxon is conspecific with *E. dahlbomi*. The drawing of the penis valve attributed to *P. dahlbomi* by Lindqvist (1961; fig. 21) seems more likely to be *E. microphyes*, while his fig. 19 in the same work, captioned as *P. microphyes*, might refer to *E. dahlbomi*.

Other specimens examined

Finland: 2♀, Lapland, Leutsuvaara, 68.917°N 20.933°E, [date unclear], reared from leaf-folds of a *Euura oblita* group species on *Salix glauca*, leg. V. Vikberg (VVT). 1♀ (PR.493VV), Kilpisjärvi r. a., 17.06.1966, leg. V. Vikberg (VVT). 1♀ (DEI-GISHym20977), Enontekiö, Mikonjärvi, 08.07.1968, leg. M. Viitasaari (SDEI). 1♀ (PR.516VV), Lapland, Leutsuvaara, 68.917°N 20.933°E, 16.06.1967, leg. V. Vikberg (VVT). 1♀, Lapland, Leutsuvaara, leg. L. H. Woollatt (VVT). 1♂ (http://id.luomus.fi/GP.110190), Leutsuvaara [766:25], 68.957°N 20.880°E, 03.07.1968 (VVT). 1♂ (ZMUO.031375), Enontekiö, Leutsuvaara 766:325, la. 12.08.2016 in *Salix glauca* (catkin), leg. M. Mutanen & T. Nyman (ZMUO). 1♀ (ZMUO.037164), Posio Riisisuo, 7349:3569 [66.22°N 28.54°E), larva 09.06.2018 in catkin of *Salix lapponum*, rearing 17/2018, leg. A. Liston, M. Mutanen & M. Prous (ZMUO). 1♀ (ZMUO.044928), Leutsuvaara 7660:3256, 24.06.2020, leg. M. Mutanen (ZMUO). 2♂ (ZMUO.058807, ZMUO.059163), Lapland, Toskalharji [768:328], 69.160°N 21.581°E, 22.06.2021, leg. Liston, Mutanen, Prous & H. Nyström (ZMUO).

Norway: 1♀ (DEI-GISHym12100), Finnmark, Grense Jakobselv 8 km S, 250m, 69.70°N 30.80°E, 30.06.2019, leg. A. Liston & M. Prous (SDEI). 5♀, 1♂ (200713_RQP), Finnmark, Kongsfjordfjell, 70.74°N 29.10°E, 07.09.2019, reared ex catkins *Salix glauca*, leg. T. Nyman (NIBIO).

Russia: 6♀, 1♂, Western Yamal Peninsula, 70.45°N 67.00°E, reared ex female catkins of *Salix lapponum*, taken 19–21.08.1994 [this very late date suggests that it may really have been *S. glauca*], emerged 03/04.1995, leg. H. Roininen (VVT). 1♀, Kanin Peninsula, leg. B. Poppius (SDEI). 4♀, 1♂ (http://id.luomus.fi/GP.110188), Kolguyev Island, 69.15°N 50.00°E, reared ex female catkins of *Salix glauca,* taken 24–26.08.1994, emerged 03.1995, leg. H. Roininen (VVT).

Sweden: 1♀ (DEI-GISHym20414), Abisko, Mt Njullá, above tree line, 900m, Malaise trap 1007, 26.06–15.07.2006, leg. SMTP (SDEI). 1♀ (DEI-GISHym19653), same locality as preceding, 04.07.2012, leg. A. Liston & A. Taeger (SDEI).

Euura freyja (Liston, Taeger & Blank, 2009)

Figures 6, 16A–B, 18E–F, Fig. 21F–G

Pontopristia analis Lindqvist, 1961: 75–76. Described: holotype ♀ (http://id.luomus.fi/GL.9215; originally private collection O. Ranin, incorporated in private collection V. Vikberg, and now deposited in MZH; examined), paratype ♂. Published type locality: Utsjoki [northern Finland]. Secondary homonym in *Euura* and *Amauronematus* of *Amauronematus analis* Konow, 1897 (= *Euura stenogaster* (Förster, 1854)).
Nematus (*Pontopristia*) *analis*: Zhelohovcev, 1988
Amauronematus (*Pontopristia*) *analis*: Liston, 1995.
Pontopristia montana Lindqvist, 1961: 76–77. Described: holotype ♀ (BMNH, examined), paratypes, ♀♂. Published type locality: Sweden, Abisko. Secondary homonym in *Euura* of *Nematus montanus* Zaddach, 1883 (= *Euura montana* (Zaddach, 1883)). **New synonym.**
Amauronematus (*Pontopristia*) *montana*: Liston, 1995; misspelling.
Euura oreophila Liston & Prous, in Prous *et al.* 2014: 53. Replacement name for *P. montana*.
Amauronematus freyja Liston, Taeger & Blank in Blank *et al.* 2009: 9–10. Replacement name for *P. analis*.
Euura freyja: Sundukov, 2017.

Diagnosis. Female: Readily distinguished from other *E. amentorum* group females by its more slender body (Fig. 6A). Other useful characters are the distally wide valvulae 3 (Fig. 6D: only similarly wide in *E. amentorum*), and the blackish fore wing costa and pterostigma (Fig. 6A–B), at least in fresh specimens, which are only similarly dark in *E. itelmena* and *E. pohjola* **sp. n.**

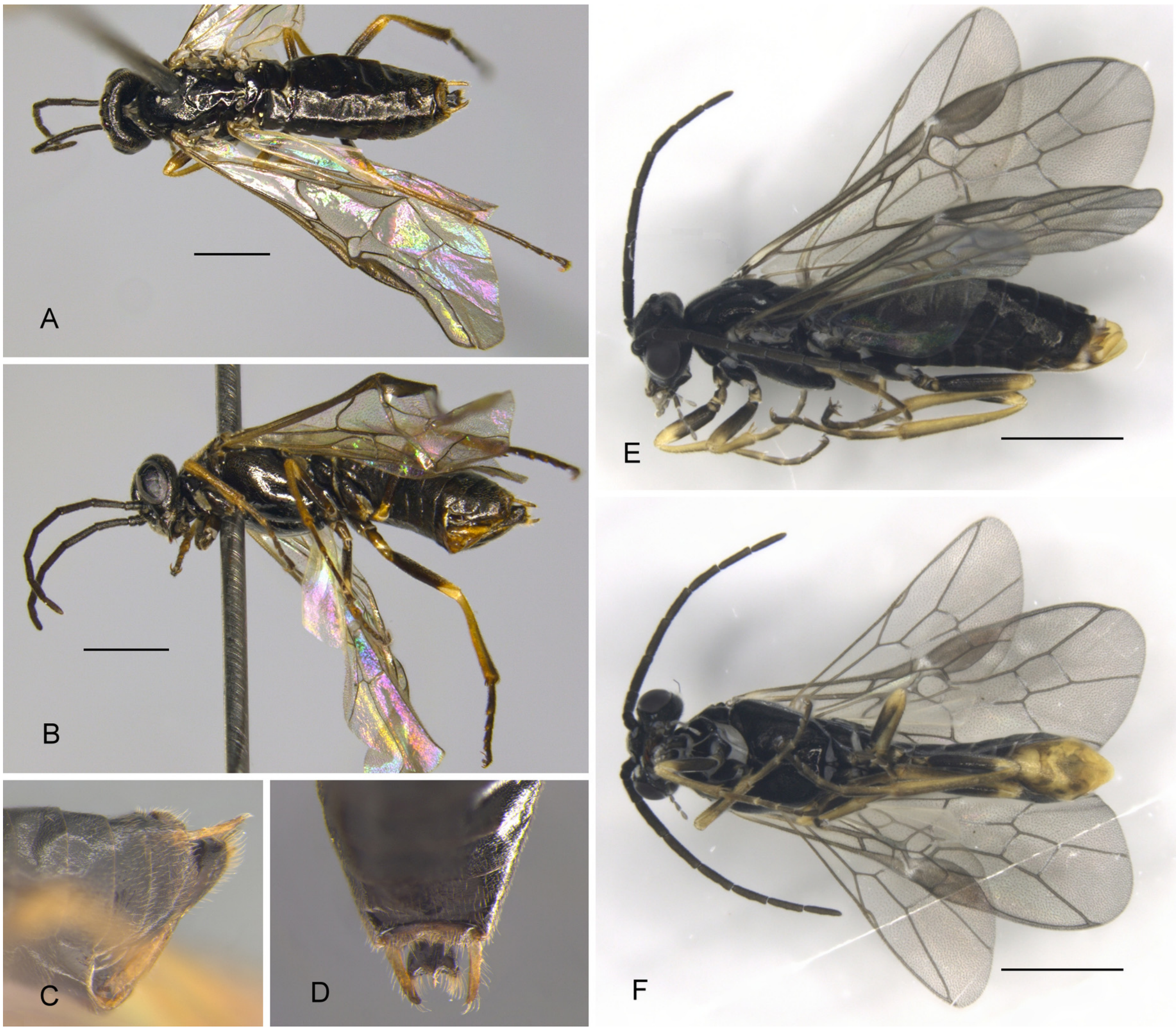

FIGURE 6. *Euura freyja*. A–D) ♀ DEI-GISHym31506. E–F) ♂ 200137_WCD. Scale bars 1 mm.

Male (Figs 6E–F): Resembles *E. microphyes*, including penis valve, but valvispina in *E. freyja* basally broader. If a constant character, the more extensively pale apical abdominal sterna of *E. freyja* (Fig. 6F: parts of 6 and 7 as well as 9) might distinguish it from other species (at most sternum 9 pale).

Description. Female (Fig. 6A–B). Body length 4.0–5.5 mm. Black. More or less pale are: labrum and mandibles; femora, tibiae, bases of tarsomeres 1; terga 9, 10, cerci, medial projection of hypopygium. Wing veins dark; fore wing pterostigma usually uniformly dark.

Head. In dorsal view narrowed behind eyes, and length posterior of eye about 0.40 × length of eye. Mostly dull with coriaceous sculpture except for labrum and the nearly smooth and moderately shiny temples and upper inner orbits. Upper head sparsely setose; setae pale, about 0.3 × as long as anterior ocellus diameter. Clypeus slightly emarginate medially. Labrum apically rounded. Antenna 0.95–1.00 × as long as fore wing costa.

Thorax. Pronotum, mesoscutum and tegula densely punctate with small shiny interspaces; vestiture similar to upper head, adpressed. Lateral mesoscutal lobe approximately 2.0 × as long as greatest width. Mesoscutellum as broad as long, without longitudinal median furrow; anterior densely punctate, posterior nearly impunctate. Mesepisternum unsculptured, shiny, with nearly uniform covering of setae, about 0.5 × as long as diameter of anterior ocellus.

Abdomen. Valvulae 3 in lateral view (Fig. 6C) clearly orientated upwards; with subtruncate apex. In dorsal view (Fig. 6D) strongly widened distally; 1.8–2.0 × as wide as narrowest distal width of metatibia. Cercus clearly reaches back farther than tip of valvulae 3 (Fig. 6C–D). Lancet (Fig. 16A–B): 19–20 annular sutures; moderately strongly curved (lower edge concave); lamnium approximately 2 × as long as radix; distal marginal serrulae clearly lobed; proximal serrulae quite flat; basal annular sutures without ctenidial teeth. Tangium with a large, broad basal lobe.

Male [based on 200137_WCD and ZMUO.058316] (Fig. 6E–F). Body length 3.9–4.3 mm. As female, except: Antenna 1.10–1.35 × as long as fore wing costa. Pale are: Abdominal sternum 9, more or less sterna 6 and 7, and cerci (Fig. 6E–F). Penis valve (Fig. 18E–F): Valvispina short and basally broad.

Variability. [Female] Interior of fore wing pterostigma sometimes paler than margins. Tergum 9 from extensively pale (brown-red) to nearly completely dark. Tergum 10 more or less pale (whitish). Tegula usually completely black, but in one specimen narrowly pale on exterior margins. [Male] A lobe below the valvispina may be well-developed (Fig. 18E) or barely visible (Fig. 18F).

Genetic data

COI. Specimens belong to BIN BOLD:ACG1728. Based on 9 specimens, maximum within species distance is 0.61% and the nearest neighbour, diverging by a minimum of 5.47%, is *E. variator*. When including also minor intraindividual COI variants, maximum within species distance is 3.34% and the nearest neighbour, diverging by a minimum of 5.3%, is *E. ampla*.

Nuclear. Based on 8 specimens, maximum within species distance is 0.06% (0.06% based on haplotypes of individual females). The nearest neighbour, diverging by a minimum of 1.3%, is *E. pohjola*.

Biology. Host plants: *Salix lanata* (Zinovjev & Vikberg 1998), *S. lapponum** (see records under Finland and Norway, below) and *S. phylicifolia** (see records under Finland and Norway, below), and according to COI barcoding of larvae recently sampled during an ongoing project in Finnmark, northern Norway, also *S. hastata**, *S. myrsinifolia**, and *S. myrsinites**.

The larva of *E. freyja* bores in the central stalk of the female catkin, a trait shared by *E. pohjola* **n. sp.** At least sometimes, *E. freyja* makes its cocoon within the stalk. Vikberg examined some larvae from *Salix lanata*: Norway, Helligskogen, 28.06.1970; head width 1.06 mm, body length 8.5 mm. Finland, Saana, Kalkkipahta, 30.06.1970 (2 larvae); head width 1.06 mm / body length 11 mm, head width 1.22 mm / body length 11 mm. During the latter excursion the larvae were noted as: body length 9–10 mm; head brownish yellow with brown spots; body yellowish, pale brown flecks on thoracic segments; anal tergum brown with darker brown spots. This agrees quite well with an image of a sequenced larva (DEI-GISHym12602) from *Salix lapponum*, numerous larvae preserved in MZH, and several larvae from northern Norway (Fig. 21F). Compared to *E. amentorum*, the larva of *E. freyja* seems to lack most of the markings on the abdomen except on segment 1 and the suranal plate, the head is paler, and all the body markings are pale brown rather than dark brown to black. The prepupa apparently (the specimens are tentatively identified as *E. freyja* because they occurred with reliably identified larvae at the same place and time on the same host species) has a much more extensively dark body (Fig. 21G).

Distribution. Northern Fennoscandia. According to Sundukov (2017) also East Palaearctic: Russia, Irkutskaya oblast.

Type material examined

Pontopristia analis. Holotype ♀: "Fennia, Li. Utsjoki kk, 8/6 1960, leg. O. Ranin", "Holotypus", "Pontopristia analis Lqv. Lindqvist det. 1960", "Photographed 2019 Pekka Malinen", "http://id.luomus.fi/GL.9215" (MZH).

Pontopristia montana. Holotype ♀: "N. Sweden: T. Lpm. Abisko. 17–22.vi.1954 / J. E. & R. B. Benson. B.M.1954-509.", "Holotypus", "Pontopristia montana Lqv. Lindqvist det. 1960", "Dissection on slide. Series No 20.xii.61/3.", "B.M. Type 1.795" (BMNH). Paratypes: 1♀, "Lp. b", "1905", "ARn", "latiserra" [Malaise' handwriting], "Pontopristia montana Lqv. Lindqvist det. 1960", "NHRS-HEVA000003681" (NHRS). 1♂, "Fennia, Li. Utsjoki kk, 10/6 1960, leg. O. Ranin", "Paratypus", "Pontopristia montana Lqv. Lindqvist det. 1960", "http://id.luomus.fi/GL.3418" [this specimen belongs to the *Euura flavescens* group, e.g. *E. reticulata* (Holmgren) or *E. lienterica* (Holmgren), as does also the penis valve illustrated by Lindqvist (1961; fig. 23) as that of *Pontopristia montana*: see Fig. 19A, C–D].

The holotype of *Pontopristia montana* is a rather small (4.6 mm long), dark-bodied specimen (although now apparently somewhat faded, especially the wing venation). The abdomen has only the hypopygium and the valvifers 2 pale. Three main characters correspond with those of *Euura freyja*, but not with any other *amentorum* group species: the elongate body shape, in lateral view apically truncate valvula 3, and the lancet morphology (based on Lindqvist's description and drawings: we were not able to examine the slide preparation of the genitalia). Accordingly, we treat *Pontopristia montana* and its replacement name *Euura oreophila* as synonyms of *E. freyja*. The lancet of the badly damaged (wings, abdomen and most of rear legs missing) female paratype (NHRS-HEVA000003681) of *P. montana* in the NHRS, determined as *P. latiserra* by Malaise according to a label, indicates that it is *E. amentorum.*

Taxonomic note. Lindqvist (1961) characterised what he supposed to be the male of *E. freyja* (under the name *P. analis*), based on a single specimen, but its penis valve (Lindqvist 1961; fig. 22) is very different from that of *E. freyja*, and belongs to the *Euura bipartita* group, e.g. *E. leucopyga* (Lindqvist) (Fig. 19B).

Other specimens examined

No locality data: 1♀ (NHRS-HEVA000006329), with small printed label "92", det . A. Haris as *Pontopristia analis* (NHRS).

Finland: Numerous reared females, preserved larvae, and catkins with feeding traces, InL, Utsjoki, Pulmankijärvi 776:53, 05.07.1976, ex *Salix lanata*, leg. J. K. Kangas (MZH). Numerous reared females, preserved larvae, and catkins with feeding traces, InL, Pulmanki 7761:539, 08.07.1976, ex *Salix lanata*, leg. E. O. Peltonen (MZH). Finland: 1♀ (DEI-GISHym12666), Lapin Lääni, Leppälä 20 km S, 69.52°N 27.22°E, 10.06.2001, leg. A. Taeger & C. Kutzscher (SDEI). 1 larva (05132/2a), Pulmankijärvi, 69.928°N 28.031°E, 01.07.2005, boring in catkin axis of *Salix lapponum*, leg. T. Nyman, det. M. Prous using DNA sequence data (NIBIO). 1 larva (09075/8r), Joensuu, 04.06.2009, boring in catkin axis of *Salix phylicifolia*, leg. T. Nyman, determined using DNA sequence data (NIBIO). 2♀, Lapland, Leutsuvaara, 550–700 m, 68.917°N 20.933°E, 24.06.2020, leg. M. Mutanen, M. Prous, A. Liston (SDEI). 1♀, same data as preceding, but 27.06.2020 (SDEI). 1♂ (ZMUO.058316), Lapland, Saarikoski [7646:3268], 68.803°N 21.258°E, 24.06.2020, reared ex *S. lapponum*, rearing no. 26/2020, leg. Liston, Mutanen & Prous (ZMUO). 1 larva (DEI-GISHym12602), Lapland, Saarikoski 1 km N, 440 m, 68.814°N 21.238°E, 26.06.2020, *Salix lapponum*, leg. M. Mutanen, M. Prous, A. Liston, det. M. Prous by sequencing (SDEI). 1♀ (ZMUO.029497), Kiiminki, 65.110°N 25.850°E, 08.05.2016, leg. M. Mutanen, det. M. Viitasaari (ZMUO). 1♀ (ZMUO.058332), Enontekiö, Doskalharji (7688:3282), larva, 14.07.2020, *Salix lapponum* rearing 57/2020, leg. M. Mutanen (ZMUO).

Norway: 1♀ (190265_CHJ), Finnmark, 69.458°N 30.001°E, 04.06.2019, leg. T. Nyman (NIBIO). 1♀ (DEI-GISHym83976), Finnmark, Grense Jakobselv 8 km S, 250m, 69.70°N 30.80°E, 24.06.2019, leg. A. Liston & M. Prous (SDEI). 1♀ (200052_OLQ), Finnmark, Melkefoss, 69.406°N 29.790°E, 11.07.2019, reared from *Salix lapponum*, leg. T. Nyman (NIBIO). 1♂ (200137_WCD), Finnmark, Svanvik, NIBIO Svanhovd, 08.07.2019, reared from *Salix lapponum*, leg. T. Nyman (NIBIO). 1♀ (200396_ZBM), Finnmark, Svanvik, NIBIO Svanhovd, 09.07.2019, reared from *Salix lapponum*, leg. T. Nyman (NIBIO). 2♀ (200414_TAI, 200416_OVX), Finnmark, Svanvik, NIBIO Svanhovd, 09.07.2019, reared from *Salix lapponum*, leg. T. Nyman (NIBIO). 3♀ (200578_FTM, 200579_FFY, 200580_LHM), Finnmark, Svanvik, NIBIO Svanhovd, 09.07.2019, reared from *Salix lapponum*, leg. T. Nyman (NIBIO). 2♀ (200688_ILA, 200692_NWH), 1♂ (200693_BSP), Finnmark, Svanvik, NIBIO Svanhovd, 09.07.2019, reared from *Salix lapponum*, leg. T. Nyman (NIBIO). 1♀ (200134_WQY), Finnmark, Svanvik, NIBIO Svanhovd, 09.07.2019, reared from *Salix phylicifolia*, leg. T. Nyman (NIBIO).

Sweden: Torne Lappmark; 1♀ (DEI-GISHym31506), Kiruna, nr. airport, 450 m, 67.84°N 20.35°E, 21.06.2012, leg. A. Liston, A. Taeger & S.M. Blank (SDEI). 1♀, Abisko National Park, E10[road], 390m, 68.35°N 18.82°E, 19.06.2012, leg. A. Liston (SDEI). 1♀ (DEI-GISHym31215), Stordalen (Abisko 9 km E), 400m, 68.35°N 19.04°E, 18.06.2012, leg. O. Lønnve (OLCO). 1♀ (DEI-GISHym19652), as preceding, but 01.07.2012, leg. A. Liston & A. Taeger (SDEI). 1♀ (DEI-GISHym19651), Björkliden, 500 m, 68.41°N 18.67°E, 18.06.2012, leg. A. Taeger & S.M. Blank (SDEI). Norrbotten: 1♀, Tornehamn, 68.417°N 18.600°E, 18.06.2012, leg. O. Lønnve (OLCO).

Euura itelmena **(Malaise, 1931)**

Figures 7, 16E–F, 21D

Pontopristia itelmena Malaise, 1931: 54. Described: syntypes, 2♀. Published type locality: Klutchi [Russia, Kamchatka]. Lectotype designated below.
Amauronematus itelmena: Benson 1962; record from Canada.
Euura itelmena: Sundukov 2017.

Diagnosis. Female. Profile of valvulae 3 in dorsal view barrel-like (Fig. 7F): widened towards about the middle, then gently narrowing to the tip. In other species, the valvulae 3 widen to a point near their tip, or are subparallel. The dark fore wing costa and stigma distinguish *E. itelmena* from other *amentorum* group species, apart from *E. freyja* and *E. pohjola* **n. sp.**

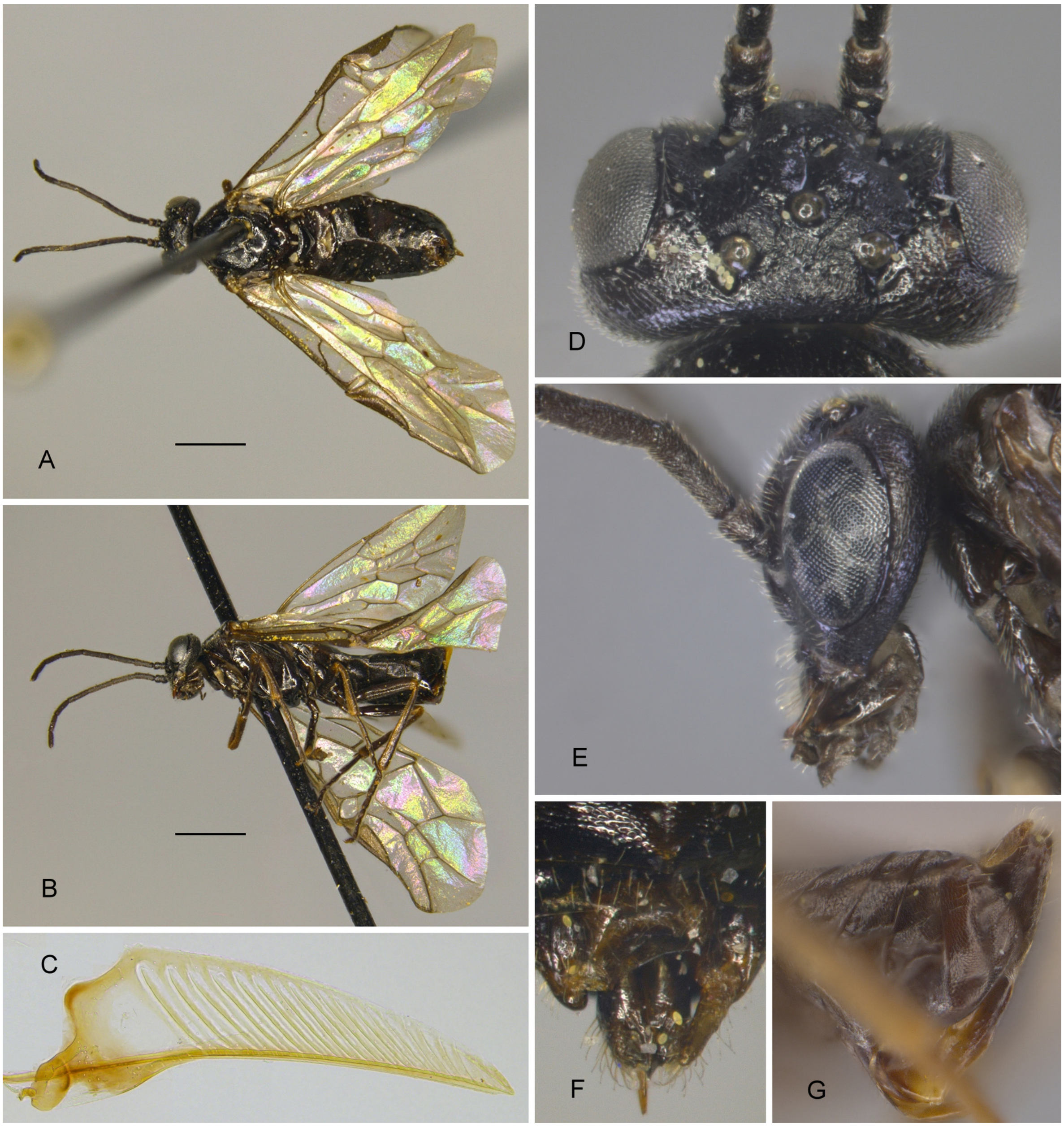

FIGURE 7. *Euura itelmena*. A–B, D, F) ♀ lectotype NHRS-HEVA000006352. C) ♀ lance PR.508VV. E) ♀ PR.507VV. G) ♀ PR.519VV. Scale bars 1 mm.

Description. Female (Fig. 7A–B). Body length 3.0–4.0 mm (lectotype 4.00 mm, European specimens 3.00–3.80 mm). Black. Pale are only more or less mandibles, fore and mid tibia, base and underside of rear tibia, extreme apices of femora, fore and mid tarsi. Cerci infuscate. Wing veins including fore wing costa and pterostigma dark [apparently faded in lectotype].

Head. In dorsal view moderately contracted behind eyes, and length posterior of eye about 0.3–0.5 × length of eye (Fig. 7D–E). Mostly dull with coriaceous sculpture except for labrum. Upper head densely setose; setae pale, about 0.5 × as long as anterior ocellus diameter. Clypeus truncate to slightly emarginate medially. Labrum apically rounded. Antenna 0.94–1.10 × as long as fore wing costa.

Thorax. Pronotum, mesoscutum and tegula densely punctate with small shiny interspaces; vestiture similar to upper head, adpressed. Lateral mesoscutal lobe approximately 1.5 × as long as greatest width. Mesoscutellum as broad as long, without longitudinal median furrow; finely sculptured and dull, but with only a few weak pits. Mesepisternum unsculptured, shiny, with nearly uniform covering of setae, about 0.6 × as long as diameter of anterior ocellus.

Abdomen. Valvulae 3 (Fig. 7G) in lateral view clearly orientated upwards; tapering to the narrowly rounded tip. In dorsal view with a barrel-like profile: widened towards about the middle, then gently narrowing to the tip; 0.9–1.1 × as wide as narrowest distal width of metatibia. Cercus reaches approximately to the tip of valvula 3. Lance: Fig. 7C. Lancet (Fig. 16E–F): 20–21 annular sutures, nearly straight, apex obtuse. Base of tangium with a small to minute lobe.

Male. Unknown.

Variability. The forewing stigma and costa of the lectotype and two of the older specimens (those from the 1960's) are markedly paler than the more recent specimens, but this seems more likely to be the result of fading than to represent natural variability. Prepared on slides, the apex of the lancet of the European specimens is distinctly obtuse. Although we only examined it *in situ*, the lancet of the lectotype appears to be apically acute, but perhaps this is a result of an off-plane viewing angle. Otherwise, the overall form of the lancet (rather straight, approximately 20 annular sutures) of the lectotype and what can be seen of its saw serrulae resemble the European specimens.

Genetic data

COI. Specimens belong to BIN BOLD:ACJ5901, which includes all *amentorum* group species, except *E. freyja* (BOLD:ACG1728). All 4 specimens are identical and the nearest neighbour, diverging by a minimum of 0.3%, is *E. microphyes*. When including also minor intraindividual COI variants, maximum within species distance is 0.61% and the nearest neighbour, diverging by a minimum of 0%, is *E. amentorum*.

Nuclear. Based on 4 specimens, maximum within species distance is 0% (0.37% based on haplotypes of individual females). The nearest neighbour, diverging by a minimum of 0.64%, is *E. dahlbomi*.

Interestingly, all four sequenced specimens from three different localities (two different places in Kilpisjärvi, Finland and Finnmark, Norway) have exactly the same haplotypes for all nuclear genes, and possibly also for mitochondrial COI. Of the three COI variants that were detected, two were present in all four specimens, and the third was present in two of them. This may indicate a parthenogenetic population at least in Fennoscandia, but could also result from low genetic diversity.

Biology. Host plants: *Salix lapponum** (see records under Finland and Norway, below), *S. lanata** (see record under Norway, below). Benson (1962) wrote that he collected a single specimen from *Salix alexensis* [sic!] [*alaxensis*], in Manitoba, Canada. This willow species, which occurs in North America and eastern Russia (Skvortsov 1999), has subsequently been mentioned as a possible host plant of *E. itelmena* (Sundukov 2017). Skvortsov (1999) placed *S. lapponum* and *S. alaxensis* as close relatives within the same species-poor section of *Salix*.

It is not clear whether the larva of *E. itelmena* bores in the central stalk of the catkin, or lives outside it. Vikberg opened some catkins in the same batch from which *E. itelmena* imagos were reared, and found some larvae inhabiting the stalks, which were thought to belong to *E. itelmena*. However, in a similar situation, Mutanen collected numerous catkins of *Salix lapponum* containing stalk-boring larvae. Although one of these larvae was sequenced and thus identified as *E. freyja*, three females of *E. itelmena* were reared from these catkins, but no imagos of *E. freyja*. Further observations on the feeding type of *E. itelmena* are needed.

Distribution. Europe: Finland and Norway. Russia: Kamtchatka. Canada: Northwest Territories, Manitoba (Goulet & Bennett 2021).

Type material examined

Pontopristia itelmena. Lectotype ♀, hereby designated: "NHRS-HEVA000006352", "itelmena", "Amauronem. amentorum Först O. Conde det. 1938", "Pontopristia itelmena Typus Malaise", "Typus", "351", "KAMTSCHATKA Malaise", "LECTOTYPE ♀ Pontopristia itelmena Malaise, 1931 des A. Liston 2018", NHRS. The paralectotype has not been located.

Other specimens examined

Finland: 1♀ (PR.517VV), Finland, Kilpisjärvi, 69.05°N 20.80°E, 21.06.1964, ovipositing in female catkin of *Salix lapponum*, leg. V. Vikberg (MZH). 1♀ (http://id.luomus.fi/GP.110178), Forssa, 60.817°N 23.633°E, 29.04.1965, leg. E. Nylund (VVT). 1♀ (DEI-GISHym111767 / PR.495VV), Kilpisjärvi, 69.05°N 20.80°E, 01.07.1968–31.07.1968, reared ex central stalk of female catkin of *Salix lapponum*, leg. V. Vikberg (VVT). 1♀ (PR.519VV), Lapin Lääni, Pallastunturi, 15.06.1971, leg. V. Vikberg (MZH). 1♀ (ZMUO.058333), Lapland, Doskalharji [7688:3282], 69.189°N 21.511°E, 14.07.2020, reared from catkin *Salix lapponum*, leg. M. Mutanen

(ZMUO). 2♀ (ZMUO.058314, 058315), Lapland, Saarikoski [7646:3268], 68.803°N 21.258°E, 24.06.2020, reared from *Salix lapponum*, leg. Liston, Mutanen & Prous (ZMUO / SDEI).

Norway: 1♀ (PR.508VV), Troms, Helligskogen, 69.20°N 20.72°E, 19.06.1973, ovipositing on *S. lapponum*, leg. V. Vikberg (VVT). 1♀ (210010_NBH), Finnmark, Austertana, 70.444°N 28.491°E, 01.06.2021, ovipositing in a female catkin of *Salix lanata* (Fig. 21D), leg. T. Nyman (NIBIO). 1♀ (190478_AFJ), Finnmark, Varanger Peninsula, Båtsfjord 9 km SW, 70.569°N 29.553°E, 27.06.2019, netted from female catkin of *Salix lanata*, leg. T. Nyman (NIBIO).

Euura latiserra **(Malaise, 1921)**

Figures 8, 14D–E

Pontopristia latiserra Malaise, 1921: 14. Described: syntypes, 5♀. Published type locality [as comment under *P. romani*, p. 14]: Vassijaure, Lappland [Sweden, Torne Lappmark, Vassijaure]. Lectotype designated below.
Nematus (*Pontopristia*) *latiserra*: Zhelohovcev, 1988.
Amauronematus (*Pontopristia*) *latiserra*: Liston, 1995.
Euura latiserra: Sundukov 2017.

Diagnosis. Female [male unknown]. Similar to dark specimens of *E. amentorum*, but differs in its distally narrower and less strongly widened valvulae 3; 1.0–1.5 × as wide as narrowest distal width of metatibia in *E. latiserra* versus 1.8–2.1 × as wide in *E. amentorum*. Average body size and the number of annular sutures of the lancet is greater than in *E. amentorum*.

Description. Female (Fig. 8A). Body length 3.2–5.4 mm. Black. Pale are only more or less mandibles, palps, labrum, tibiae, apices of femora. Cerci pale. Wing veins including fore wing pterostigma pale.

Head. In dorsal view moderately contracted behind eyes, and length posterior of eye about 0.50 × length of eye (Fig. 8B). Mostly dull with coriaceous sculpture except for labrum. Upper head densely setose; setae pale, about 0.8 × as long as anterior ocellus diameter. Clypeus slightly emarginate medially. Labrum apically rounded. Antenna 0.77–0.80 × as long as fore wing costa.

Thorax. Pronotum, mesoscutum and tegula densely punctate with small shiny interspaces; vestiture similar to upper head, adpressed. Lateral mesoscutal lobe approximately 1.33 × as long as greatest width. Mesoscutellum as broad as long, without longitudinal median furrow; finely sculptured and dull. Upper half of mesepisternum slightly sculptured (Fig. 8C), with small ventral glabrous patch; setae about 0.5 × as long as diameter of anterior ocellus.

Abdomen. Valvulae 3 in lateral view (Fig. 8E) clearly orientated upwards; tapering to the narrowly rounded tip. In dorsal view (Fig. 8D) subparallel-sided: widened slightly distally, then gently narrowing before the tip; 1.0–1.5 × as wide as narrowest distal width of metatibia. Cercus reaches past the tip of valvulae 3. Lancet (Fig. 14D–E): 17–19 annular sutures; lamnium long and low; moderately strongly curved (lower edge concave); serrulae distally somewhat lobed, basally more flat; basal annular sutures without ctenidial teeth; base of tangium with prominent, narrow lobe.

Male. Unknown.

Biology. Host plants: *Salix lanata** (see records below).

Vikberg & E. O. Peltonen made the following observations: The larvae live among the ovaries, on which they mostly feed, but some feeding on the catkin stalks also occurred. Larva: head black, body with dark flecks, anal tergum black. Prepupa: head pale brown, body extensively grey. Three prepared larvae have the following measurements: head width 0.95, 0.96 and 0.98 mm, and body length (maximal extension) respectively 12.2, 12.6 and 12.7 mm.

Distribution. Northern Norway and Sweden. According to Sundukov (2017) widespread in the East Palaearctic from western Siberia to the Russian Far East.

Type material examined

Pontopristia latiserra. Lectotype ♀, hereby designated: “NHRS-HEVA000003679”, “T.Lp.” [Torne Lappmark], “30/6”, “latiserra Mal.”, “Type”, “P.pr. latiserra Mal.”, “Pontopristia latiserra Mal. Lindqvist det. 1960”, “Holotypus”, “Lectotype Pontopristia latiserra Malaise, 1921 designated A. Liston 2020”. Paralectotypes: 2♀ (NHRS-HEVA000006332, NHRS-HEVA000006333), with labels similar to lectotype (NHRS).

One paralectotype (NHRS-HEVA000003681) is at the same time a paratype of *Pontopristia montana* (see under *E. freyja*), and a second (NHRS-HEVA000003675) is a paratype of *Pontopristia boreoalpina* (see under *E. microphyes*).

Other specimens examined

Norway: 1♀ (PR.507VV), Troms, Helligskogen, 69.20°N 20.72°E, 06.07.1968, leg. V. Vikberg (VVT). 3♀, Helligskogen, regio alpina, reared ex female catkins of *Salix lanata*, taken 28.06.1970, em. 03.1971, leg. V. Vikberg (VVT / SDEI). 1♀ (PR.486VV), Troms, Helligskogen, 69.20°N 20.72°E, reared ex *Salix lanata* catkin, emerged 25.01.1971, leg. E. O. Peltonen (VVT). 1♀, same data as preceding except emerged 24.01.1971 (VVT). 2♀, same data as preceding except emerged 26.01.1971 (VVT). 1♀, same data as preceding except emerged 12.02.1971 (VVT).

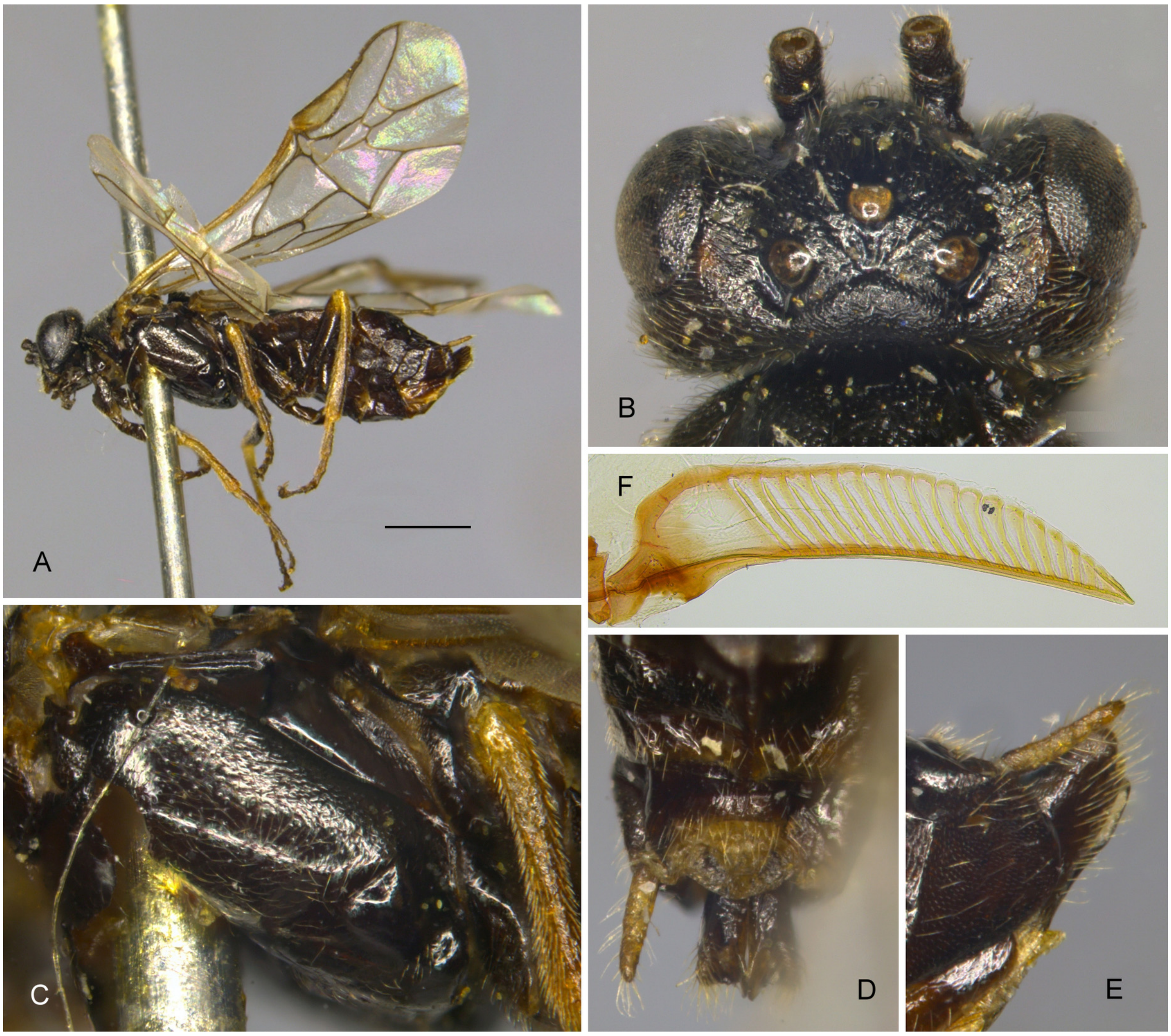

FIGURE 8. *Euura latiserra*. A–E) ♀ lectotype NHRS-HEVA000003679. F) ♀ lance DEI-GISHym12678. Scale bar 1 mm.

Euura microphyes (Förster, 1854)

Figures 9, 10, 15C–E, 18D

Nematus microphyes Förster, 1854: 344–345. Described: holotype ♀ (ZSM, examined). Published type locality: near Aachen [Germany].

Amauronematus microphyes: Benson, 1962.

Amauronematus (*Pontopristia*) *microphyes*: Liston, 1995.

Euura microphyes: Sundukov, 2017.

Pontopristia romani Malaise, 1921: 14. Described: syntypes, 2♀. Published type locality: Vassijaure, Lappland [Sweden, Vassijaure]. Lectotype designated below. Synonymy with *Pontopristia microphyes* by Lindqvist (1961).

Pontopristia brevilabris Malaise, 1921: 14. Described: syntypes, ♀ (NHRS, examined). Published type locality [as comment under *P. romani*, p. 14]: Vassijaure, Lappland [Sweden, Vassijaure]. Lectotype designated below. **New synonym.**

Nematus (*Pontopristia*) *brevilabris*: Zhelohovcev, 1988

Amauronematus (*Pontopristia*) *brevilabris*: Liston, 1995.

Amauronematus fennicus Lindqvist, 1944: 33–34. Described: syntypes, ♀ (FMNH; 1 specimen examined). Published type locality: Fredriksberg bei Helsingfors [Finland, Helsinki-Pasila]. **New synonym.**

Pontopristia fennicus Lindqvist, 1949: 68. Misspelling.

Pontopristia nana Lindqvist, 1949: 68–69. Described: holotype ♀ (FMNH, examined), paratype ♀. Published type locality: Fredriksberg bei Helsingfors [Finland, Helsinki-Pasila]. Synonymy with *Pontopristia microphyes* by Lindqvist (1961).

Amauronematus latiserra: Benson 1960b, misidentification; from Switzerland.

Pontopristia boreoalpina Lindqvist, 1961: 77. Described: holotype ♀ (BMNH, not examined), paratypes, ♀. Published type locality: Schweiz, Valais, Verpecle [sic!] [Switzerland, Valais, Ferpècle]. **New synonym.**

Pontopristia punctulata Lindqvist, 1961: 77–78. Described: holotype ♀ (NHRS, examined), paratypes ♀♂. Published type locality: Swedish Lapland. Secondary homonym in *Euura* of *Nematus punctulatus* Thomson, 1863 (= *Euura vaga* (Fabricius, 1781)). **New synonym.**

Nematus (*Pontopristia*) *punctulatus*: Zhelohovcev, 1988

Amauronematus (*Pontopristia*) *punctulata*: Liston, 1995; misspelling.

Euura suecica Blank & Taeger, in Prous *et al.* 2014: 54. Replacement name for *Pontopristia punctulata*.

Nematus (*Pontopristia*) *boreoalpinus*: Zhelohovcev 1988.

Amauronematus boreoalpina: Taeger *et al.* (2006), misspelling.

Amauronematus pyrenaeus Lacourt, 1995: 66–67. Described: holotype ♀ (MNHM, not examined), 2♀ paratypes (Collection T. Noblecourt, 1 examined). Published type locality: Port d'Envalira (Andorre) [Andorra]. **New synonym.**

Pontopristia pyrenaena: Lacourt, 1999: 10, misspelling.

Pontopristia pyrenaica: Lacourt, 1999: 295, misspelling.

Amauronematus (*Pontopristia*) *boreoalpina*: Liston (1995: 147), misspelling.

Amauronematus (*Pontopristia*) *boreoalpinus*: Taeger *et al.* (2006: 408).

Euura boreoalpina: Prous *et al.* (2014: 53).

Diagnosis. Female: The very narrow valvulae 3 (apical width 0.9–1.0 × narrowest distal width of metatibia) helps to distinguish *E. microphyes* from other species of the *amentorum* group. Also characteristic is the comparatively short and high lamnium of the lancet, with only 15–16 annular sutures.

Male: The penis valve is very similar to that of *E. freyja*, except for the narrower base of the valvispina in *E. microphyes*. If the extensively pale colour of abdominal sterna 6, 7 and 9 in *E. freyja* proves to be a stable character, this might distinguish it (only sternum 9 pale in *E. microphyes*).

Description. Female (Fig. 9A–B). Body length 3.3–5.0 mm. Black. Pale are more or less mandibles, palps, labrum, tibiae, apices of femora, cerci. Wing veins including fore wing pterostigma pale.

Head (Fig. 9C). In dorsal view moderately to strongly contracted behind eyes, and length posterior of eye about 0.4–0.5 × length of eye. Mostly dull with coriaceous sculpture except for labrum. Upper head densely setose; setae pale, about as long as anterior ocellus diameter. Clypeus slightly emarginate medially (Fig. 9D). Antenna 0.94–1.03 × as long as fore wing costa.

Thorax. Pronotum, mesoscutum and tegula densely punctate with small shiny interspaces; vestiture similar to upper head, adpressed. Lateral mesoscutal lobe approximately 1.50 × as long as greatest width. Mesoscutellum as broad as long, without longitudinal median furrow; with few, extremely weak punctures; smooth and shiny. Mesepisternum smooth, shiny; with posterior-ventral glabrous patch; setae about 0.7 × as long as diameter of anterior ocellus.

Abdomen. Valvulae 3 in lateral view (Fig. 9F) clearly orientated upwards; tapering to the narrowly rounded tip. In dorsal view (Fig. 9E) subparallel-sided, widened slightly just before apex; apical width 0.9–1.0 × narrowest distal width of metatibia. Cercus reaches to tip of valvula 3, or just past it. Lancet (Fig. 15C–E): 15–16 annular sutures; lamnium short and high; moderately strongly curved (lower edge concave); serrulae short and strongly protruding on all but most basal 2 annuli; basal annular sutures without ctenidial serrulae. Base of tangium with a moderately developed lobe.

Male (Fig. 10A). Body length 3.4–4.2 mm. As female, except: In dorsal view length of head posterior of eye 0.3 × length of eye (Fig. 10B). Antenna approximately as long as costa of fore wing, slightly tapered towards apex. Tergum 8 hollows deep and reaching almost to base of tergum. Procidentia nearly rectangular; projects beyond posterior margin of tergum (Fig. 10C). Abdominal sternum 9 paler than other sterna. Forewing costa and stigma dark. Penis valve (Fig. 18D): lobe on paravalva below valvispina small or absent; valvispina short and basally narrow.

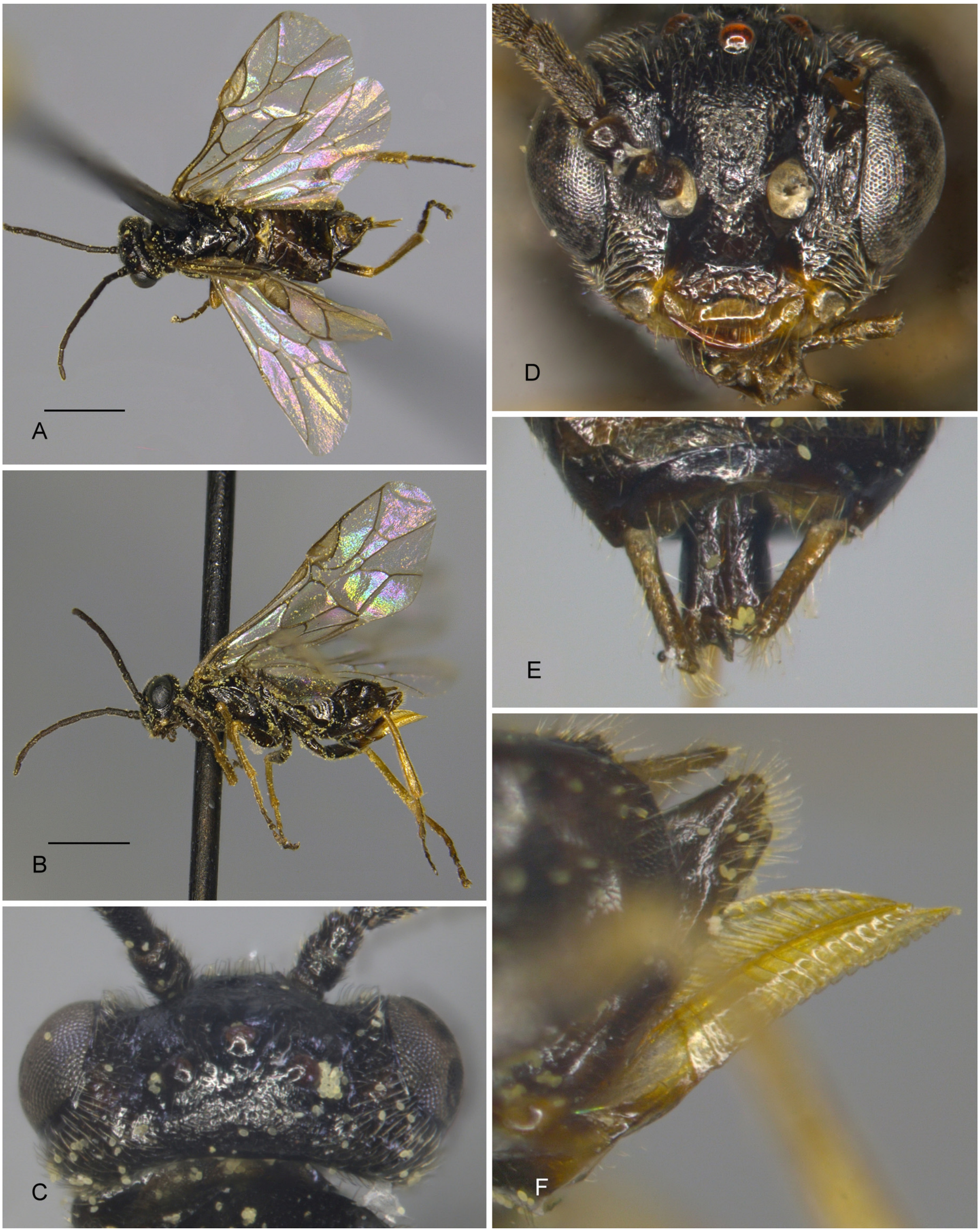

FIGURE 9. *Euura microphyes*. A–C, F) ♀ paratype *Amauronematus pyrenaeus* DEI-GISHym12667. D) ♀ lectotype *Pontopristia brevilabris* NHRS-HEVA000003674. E) ♀ http://id.luomus.fi/GP.3414. Scale bars 1 mm.

Variability. The upper part of the mesepisternum is usually without noticeable sculpture, and shiny, but may sometimes be roughly sculptured and more or less matt, as in, for example the holotype female of *Pontopristia punctulata* and one male specimen (http://id.luomus.fi/GL.3416). The lobe at the base of the tangium varies from rather prominent (Fig. 15C) to weakly developed (Fig. 15E). The clypeus of females varies from completely black to largely pale.

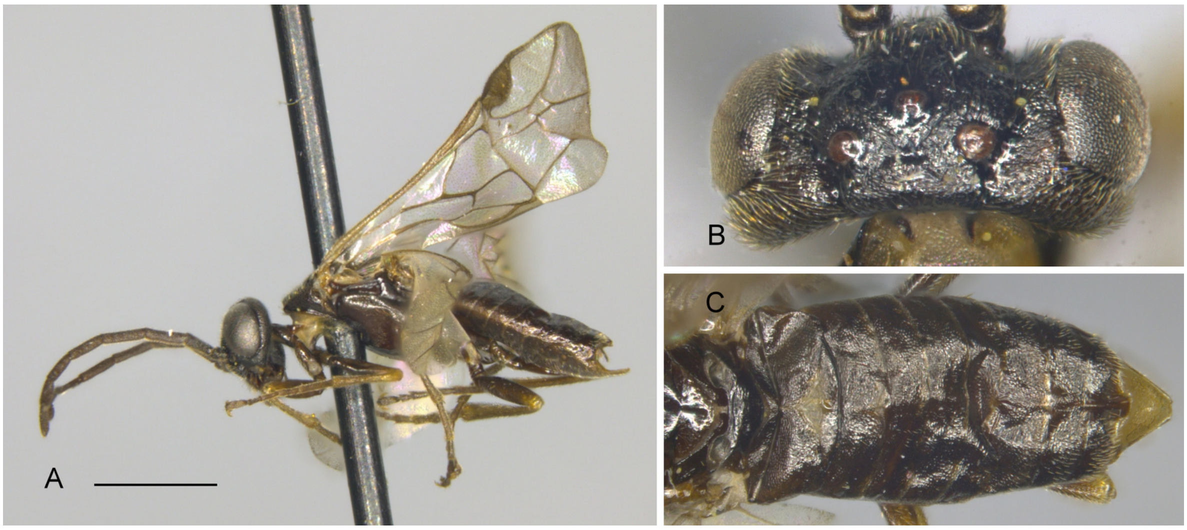

FIGURE 10. *Euura microphyes*. A–C) ♂ http://id.luomus.fi/GP.3416. Scale bar 1 mm.

Genetic data

COI. Specimens belong to BIN BOLD:ACJ5901, which includes all *amentorum* group species, except *E. freyja* (BOLD:ACG1728). Based on 5 specimens, maximum within species distance is 0.32% and the nearest neighbour, diverging by a minimum of 0.15%, is *E. amentorum*.

Nuclear. Based on 3 specimens, maximum within species distance is 0.03% (0% based on haplotypes of individual females). The nearest neighbour, diverging by a minimum of 0.46%, is *E. dahlbomi*.

Biology. Host plants: *Salix hastata** (see record from Finland, below), *S. herbacea** (see record from Norway, below), *S. phylicifolia** (see record from Norway, below), *S. reticulata* (see records from Finland, below). According to Chernov *et al.* (1975, p. 23, fig. 2.4, as *Pontopristia borealpina* [sic!]), *Salix arctica* is also a host. Imagos were collected from catkins of *Salix retusa* by Beneš (1962). Other *Salix* species must also be hosts, as indicated by the type locality of *Nematus microphyes* (Germany, Aachen area), where none of the previously mentioned *Salix* species occurs.

Distribution. Northern Europe (Norway, Sweden, and Finland [records below], and Russia [Sundukov 2017]), mountains of central Europe (Alps of Switzerland and France: Lindqvist 1961, Lacourt 1985); High Tatras (Beneš 1962); Pyrenees (Lacourt 1995), and very rare in the central European lowlands: where the only recorded specimen is the holotype of *N. microphyes*, from north-west Germany. According to Chernov *et al.* (1975) and Popov (2011) also found in the East Palaearctic (Russia): respectively Taimyr Peninsula, and Yakutia. According to Benson (1962) also in North America (Canada, Ontario).

Type material examined

Nematus microphyes. Holotype ♀: “GBIF-GISHym3353”, “Nematus microphyes Frst. A. Förster det.”, “Pontopristia microphyes Först. Lindqvist det. 1960”, “Type”, “Sammlung A. Förster”, “Amauronem. amentorum Först. O. Conde det. 19”, ZSM.

Pontopristia romani. Lectotype ♀, hereby designated: “NHRS-HEVA000003680”, “Lp b” [Lapponia borealis], “20/7 08”, “Typus” [white, printed], “Typus” [red, printed]. “P.pr. romani Mal.”, “Amauronem. amentorum ♀ Forst. O. Conde det. 1939”, “romani Mal”, “Pontopristia microphyes Först. Lindqvist det. 1960”, “LECTOTYPE Pontopr. romani MAL. A. Haris 2003”, “Pontopristia microphyes Först. Det: A. Haris 2003”, NHRS.

Pontopristia brevilabris. Lectotype ♀, hereby designated: NHRS-HEVA000003674 “Lp. b.” [Lapponia borealis], “ARn” [A. Roman], “Type”, “Holotypus” [red, printed], “Ppr. brevilabris Mal.”, “brevilabris Mal.”, “Pontopristia brevilabris Mal. Lindqvist det. 1960”, “LECTOTYPE ♀ Pontopristia brevilabris Malaise, 1921 des. Liston 2018” [red, handwritten], “NHRS-HEVA000003674”. Most of the ovipositor is missing from the specimen, and has not been located. Status as former syntype unclear: 1♀ (NHRS-HEVA000006331), “Lp. b.”, “ARn”, “Pontopristia brevilabris Mal. Det: A. Haris 2003”; one nearly intact lancet and part of the other are gummed to a card pinned with the specimen. No other specimens labelled by Malaise as *brevilabris* are now in the NHRS. However, the specimen with code NHRS-HEVA000006331 may have been a syntype. The apparent shape of its labrum is very similar to the lectotype of *P. brevilabris*: see remarks on the shape of the labrum under "Character states". Its lancet is indistinguishable from studied specimens of *Euura microphyes*. Note that the holotype of *Nematus microphyes* also appears to have a short, apically truncate labrum. Because we have found no other characters which distinguish them, *P. brevilabris* is treated as a new synonym of *E. microphyes*.

Amauronematus fennicus. Lectotype ♀, hereby designated: "http://id.luomus.fi/GL.3417". This is the same specimen as the holotype of *Pontopristia nana* [below], making these taxa objective synonyms. The female mentioned as the other syntype of *A. fennicus* by Lindqvist (1944) is the paratype of *P. nana*. Until now, *Amauronematus fennicus* has been overlooked as an available name, although the brief description of the lancet and comparison with two other nominal species (Lindqvist 1944: 34) represents a valid description. Lindqvist (1949) stated that he held the name *fennicus* to be "disadvantageous", because he considered the nominal taxon *Nematus fennicus* André (currently placed as a synonym of *Platycampus luridiventris* (Fallén)) to be a member of "the closely related genus *Pontania*" [translated from German].

Pontopristia nana. Holotype ♀: "http://id.luomus.fi/GL.3417", "Photographed 2014 Pekka Malinen", "Mus. Zool. H:fors Spec. typ. No 5676 Pontopristia nana Lindqv.", "Pontopristia nana Lqv Lindqvist det. 1949", "Holotypus", "F:berg 14.5.43 Lindqvist", FMNH.

Pontopristia boreoalpina. Paratype ♀: "Lp. b" [Lapponia borealis], "ARn" [A. Roman], "latiserra", "Pontopristia boreoalpina Lqv. Lindqvist det. 1960", "NHRS-HEVA000003675" (NHRS). 1♀, labels as preceding but "NHRS-HEVA000006336" and lacking "latiserra" (NHRS).

Pontopristia punctulata. Holotype ♀: "NHRS-HEVA000003682", "Holotypus", "Lp. b." [Lapponia borealis], "ARn" [A. Roman], "Pontopristia punctulata Lqv. Lindqvist det. 1960" (NHRS). Paratypes: 1♀, "Lp.b", "ARn", "Pontopristia punctulata Lqv. Lindqvist det. 1960", "NHRS-HEVA000006338" (NHRS). 1♂, "Lp.b", "1903", "ARn", "Pontopristia punctulata Lqv. Lindqvist det. 1960", "NHRS-HEVA000006337" (NHRS). 1♂, "Fennia Li. Utsjoki kk 12/6.1960", "Paratypus", "Pontopristia punctulata Lqv. Lindqvist det. 1960", "coll. Eitel Lindqvist", "http://id.luomus.fi/GL.3422", "Photographed 2014 Pekka Malinen". The males do not belong to the *amentorum* group (Vikberg 1982). Based on its penis valve, NHRS-HEVA000006337 belongs to *E. flavescens* group. The lancet of the *P. punctulata* holotype closely resembles the lancet of *microphyes* in the shape of the serrulae and annular sutures, and proportions of the lamnium (length / basal height = 4.26). Externally, apart from the more or less sculptured and dull upper parts of the mesepisternum (see under Character states), it does not significantly differ from other specimens of *E. microphyes*. Accordingly, we synonymise these nominal taxa.

Amauronematus pyrenaeus. Paratype ♀ (DEI-GISHym12667): Andorra, Port d'Envalira, 2450m, 18.07.1993, leg. M. Gaillard (SDEI). The original description by Lacourt (1995) of *Amauronematus pyrenaeus* does not mention any characters which distinguish it from other species in the *E. amentorum* group. We identified a paratype of *A. pyrenaeus* as *E. microphyes* based on the narrow valvulae 3 in dorsal view, and the closely similar morphology of the lancets. Because no characters have been found to distinguish *A. pyrenaeus* from *E. microphyes*, we are treating these names as synonyms.

Taxonomic note. The male (Finland: http://id.luomus.fi/GL.3416) briefly described under *Pontopristia microphyes* by Lindqvist (1961) is apparently correctly associated, but the penis valve illustrated in that paper as *P. microphyes* belongs to *E. dahlbomi*. The male associated with *P. brevilabris* by Lindqvist (1961; fig. 20) might not belong to the *Euura amentorum* group (Vikberg 1982).

Other specimens examined

Finland: 1♂ (http://id.luomus.fi/GL.3416), Helsinki, Pasila, 05.05.1949, leg. Karvonen, "Allotype" [Lindqvist 1961] (FMNH). 1♀ (PR.492VV), Helsinki, 20.05.1964, leg. O. Ranin (VVT). 1♀ (PR.512VV), Lapin Lääni, Saana, 69.05°N 20.85°E, 15.07.1969, reared ex catkin *Salix hastata*, leg. V. Vikberg (VVT). 1♀ (PR.511VV / DEI 111777), Lapin Lääni, Saana, 69.050°N 20.850°E, 27.07.1971, ex larva *Salix reticulata*, leg. V. Vikberg (VVT). 1♀ (ZMUO.031386), Le, Enontekiö, Kilpisjärvi, Malla, 69.046°N 20.855°E, la. 11.08.2016 in catkin of *Salix reticulata*, leg. M. Mutanen & T. Nyman (ZMUO). 2♀ (DEI-GISHym84735, DEI-GISHym84736), Le, Enontekiö, Saana 767:325, la. 13.08.2016 in catkin of *Salix reticulata*, leg. M. Mutanen & T. Nyman (ZMUO).

Norway: 1♀ (PR.498VV), Dovre, Snöheim, 62.29°N 9.35°E, 01–31.08.1968, reared ex *Salix herbacea*, leg. V. Vikberg (VVT). 1♂ (200244_KTP), Finnmark, NIBIO Svanhovd, 30 m, 69.454°N 30.040°E, 09.07.2019 (larva), *Salix phylicifolia*, leg. T. Nyman (NIBIO).

Sweden: 1♀, Skåne, Malmö, Limhamns Kalkbrott, 55.57°N 12.93°E, 29.02–30.03.2012, leg. B.W.Svensson & Co, Malaise Trap (MZLU). 1♀ (DEI-GISHym31085), Norbottens Län, Kalix, Storöhamn, 65.731°N 23.084°E, 01.06.2014, leg. A. Liston & M. Prous (SDEI).

Euura pohjola new species

Figures 11, 12, 16C–D, 18B

Diagnosis. The shape of the head behind the eyes distinguishes both sexes of *E. pohjola* **n. sp.** from other members of the *amentorum* group: in *E. pohjola* it is longer than, and in dorsal view not as strongly contracted as in the other species. In its dark stigma and costa *E. pohjola* resembles *E. freyja* (more slender body and valvulae 3 apically strongly expanded) and *E. itelmena* (lancet lower compared to its length).

Description. Female (Figs 11A–B). Body length 5.5–6.0 mm [holotype 5.5 mm]. Black. More or less pale are: labrum and mandibles; extreme apices of femora, undersides of tibiae, bases of tarsomeres 1; tergum 10, cerci, medial projection of hypopygium. Wing veins dark; fore wing pterostigma dark around edges, with paler central area.

Head. In dorsal view scarcely narrowed behind eyes, and length posterior of eye about 0.65–0.80 × length of eye (Fig. 11C). Face dull, with coriaceous sculpture on all parts except labrum (Fig. 11D). Densely setose; setae pale, about as long as anterior ocellus. Clypeus slightly emarginate medially. Labrum apically rounded. Antenna (Fig. 11J) approximately 0.75 × as long as fore wing costa.

Thorax. Pronotum, mesoscutum and tegula densely punctate with small shiny interspaces; densely setose; setae much shorter than on head, about 0.3–0.5 × as long as anterior ocellus, adpressed. Lateral mesoscutal lobe approximately 1.4 × as long as greatest width. Mesoscutellum as broad as long, with weak longitudinal median furrow; punctures slightly less dense than on mesoscutum. Mesepisternum unsculptured, shiny, with nearly uniform covering of setae, about 0.3 × as long as diameter of anterior ocellus.

Abdomen. Valvulae 3 in lateral view basally rather broad, apically truncate (Fig. 11H). In dorsal view nearly parallel-sided (Fig. 11G); distally approximately 1.5 × as wide as narrowest apical width of metatibia. Cercus reaches back approximately to tip of valvula 3. Lancet (Fig. 16C–D): 19 annular sutures; slightly curved; serrulae of lamnium rather flat; basal annular sutures without ctenidial teeth. Base of tangium with a moderately large lobe.

Male (Fig. 11I). Body length 4.0–5.5 mm. As female, except: Abdomen black apart from pale cerci, and sternum 9 (slightly paler than other sterna). Head behind eyes in dorsal view narrower, and length posterior of eye about 0.45–0.70 × length of eye (Fig. 12D). Antenna 0.8–1.0 × as long as fore wing costa. Penis valve: Fig. 18B.

Variability. Female: The ovipositor is not always strongly upwardly orientated. Male: Tergal hollows and procidentia of tergum 8 highly variable (Fig. 12A–C). Tergal hollows vary from scarcely developed, to deep and long, and from almost completely sclerotised (black) to extensively unsclerotised (pale). Procidentia subtriangular to rectangular, and scarcely projecting beyond edge of tergum to clearly projecting.

Etymology. The species name, a noun, is that of the northern land of Pohjola, which figures prominently in the Finnish national mythological epic, the Kalevala.

Genetic data

COI. Specimens belong to BIN BOLD:ACJ5901, which includes all *amentorum* group species, except *E. freyja* (BOLD:ACG1728) and to BOLD:AEW4853 (only ZMUO.033762). Based on 4 specimens, maximum within species distance is 1.67% and the nearest neighbour, diverging by a minimum of 0.3%, is *E. microphyes*. When including also minor intraindividual COI variants, maximum within species distance is 2.13% and the nearest neighbour, diverging by a minimum of 0.15%, is also *E. microphyes*.

Nuclear. Based on 4 specimens, maximum within species distance is 0.07% (0% based on haplotypes of individual females). The nearest neighbour, diverging by a minimum of 1.3%, is *E. freyja*.

Biology. Host plant: *Salix lanata*. Similarly to *E. freyja*, the larva of this species bores in the central stalk of the catkin. Overwintering probably takes place within the catkin stalk: field collection of two specimens in cocoons in stalks by Mutanen.

Distribution. Northern Finland, Norway, and Russia (Novaya Zemlya).

FIGURE 11. *Euura pohjola* **n. sp.** A–C, E–G) ♀ holotype ZMUO.030866. D, H) ♀ paratype ZMUO.033762. I) ♂ paratype ZMUO.037228. J) ♂ paratype ZMUO.040903. K) ♂ paratype ZMUO.037229, metatarsus. Scale bars 1 mm.

FIGURE 12. *Euura pohjola* **n. sp.** A, D) ♂ paratype ZMUO.040902. B) ♂ paratype ZMUO.037229. C) ♂ paratype DEI-GISHym13882. E) ♂ paratype ZMUO.030821.

Material examined

Holotype ♀ (ZMUO.030866): Utsjoki, Isonkivenvaara, 7776:3533 [Finland: Lapponia inarensis, Nuorgam, 70.063°N 27.880°E], 07.07.2017, reared ex *Salix lanata*, rearing no. 56/2017, leg. M. Mutanen, N. Mutanen, A. Mutanen (ZMUO).

Paratypes. Finland: 1♀ (ZMUO.033762), same data as holotype (SDEI). 1♂ (ZMUO.030821): same locality as holotype, 07.07.2017, reared ex *Salix lanata*, rearing no. 55/2017, leg. M. Mutanen, N. Mutanen, A. Mutanen (ZMUO). 1♀ (ZMUO.037222), 1♂ (ZMUO.037224): same locality as holotype, 05.07.2018, in catkin of *Salix lanata*, rearing 101/2018, leg. M. Mutanen, N. Mutanen, A. Mutanen (SDEI). 3♂ (ZMUO.037228, ZMUO.037229, ZMUO.037230), Utsjoki, Pulmankijärvi 7761:3539, larva 05.07.2018 in catkin of *Salix lanata*, rearing 102/2018, leg. M. Mutanen, N. Mutanen, A. Mutanen (ZMUO). 2♂ (ZMUO.040902, ZMUO.040903): same locality as holotype, larva 15.08.2019 in catkin of *Salix lanata*, rearing 436/2019, leg. M. Mutanen (respectively SDEI, ZMUO). 1♂ (ZMUO.059143), Lapland, Toskalharji [768:328], 69.160°N 21.581°E, 22.06.2021, leg. Liston, Mutanen, Prous & H. Nyström (ZMUO).

Norway: 3♀ (200190_FHQ, 200191_VPK, 200192_DAK), Finnmark, Varangerfjorden, Skallelv (70.190°N 30.334°E), 16.07.2019, reared from *Salix lanata* catkins, leg. T. Nyman (NIBIO). 1♀ (200753_EZV), Finnmark, Varanger Peninsula, Syltefjordveien, 08.09.2019, reared from *Salix lanata* catkins, leg. T. Nyman (NIBIO). 1♀ (190478_AFJ), Finnmark, Varanger Peninsula, Båtsfjord 9 km SW, 70.569°N 29.553°E, 27.06.2019, netted from female catkin of *Salix lanata*, leg. T. Nyman (NIBIO).

Other material

The penis valve of *E. pohjola* is distinctive (Fig. 18B), and easily distinguishable from that of other known *Euura* species, although it is rather similar to that of *Nematus umbratus* Thomson, 1871. Lindqvist (1967, fig. 14) figured, as "*Nematus* sp." what is apparently a penis valve of *E. pohjola*, belonging to one of the three male specimens in the syntype series of *Nematus udus* Holmgren, 1883 (Type locality: Russia, Novaya Zemlya). This specimen was subsequently identified by Lindqvist (1968) as a male of *Pteronidea holmgreni* Lindqvist, 1968. According to Lindqvist (1967), the other two syntype specimens of *N. udus* represent the species currently called *Euura uda* (Holmgren) and *Euura clibrichella* (Cameron). The syntypes of *N. udus* are unfortunately missing at present from the NHRS collection. The male holotype of *Pteronidea holmgreni* (Type locality: Sweden, Torneträsk Region) belongs to *Nematus umbratus* (new synonym).

***Euura ursaminor* new species**

Figures 13, 15A–B

Diagnosis. Resembles some specimens of *E. microphyes* in its small body size. *Euura microphyes* differs in its distally narrower valvulae 3 (0.9–1.0 × as wide as narrowest apical width of metatibia) and higher lancet.

FIGURE 13. *Euura ursaminor* **n. sp.** A–B, D, G–H) ♀ paratype DEI-GISHym31946. C, E–F) ♀ holotype PR.513VV. Scale bars 1 mm.

Description. Female (Fig. 13A–B). Body length 2.75–3.00 mm [holotype 2.75 mm]. Black. More or less pale are: labrum and mandibles, upper inner orbits, tibiae, and apices of femora. Wing veins basad of forewing pterostigma brown, distally paler; pterostigma and costa pale.

Head. In dorsal view strongly narrowed behind eyes; length posterior of eye about 0.4 × length of eye (Fig. 13D). Dull, with coriaceous sculpture on all parts except labrum (Fig. 13C–D). Mostly densely setose; less so on ocellar and frontal areas; setae on temples and upper inner orbits about as long as anterior ocellus but much shorter on ocellar and frontal areas; setae pale. Clypeus slightly emarginate medially; labrum apically rounded (Fig. 13C). Antenna (Fig. 13F) 1.00–1.05 × as long as fore wing costa.

Thorax. Pronotum dull, with fine, reticulate sculpture. Tegula densely and finely punctured; interspaces shiny. Medial mesoscutal lobe dull, with strong sculpture; laterally with deep punctures. Lateral mesoscutal lobes and mesoscutellum shinier, with sparser punctation and less sculptured interspaces. Lateral mesoscutal lobe approximately 1.60–1.70 × as long as greatest width. Anterior of thorax more densely setose than posterior; setae about 0.3–0.5 × as long as anterior ocellus, adpressed. Mesoscutellum as broad as long, with no indication of a longitudinal median furrow. Mesepisternum unsculptured, shiny; dorsally with dense setae, about 0.3 × as long as diameter of anterior ocellus; ventrally largely glabrous.

Abdomen. Valvulae 3 in lateral view (Fig. 13H) clearly orientated upwards; rather narrow, with rounded apex. In dorsal view (Fig. 13G) strongly expanding distally; apical width about 1.6 × narrowest distal width of metatibia. Cercus reaches back past tip of valvula 3. Lancet (Fig. 15A–B): slightly curved; 14–20 annular sutures; all serrulae with clearly developed lobe; basal annular sutures without ctenidial teeth. Base of tangium without clearly developed lobe.

Male. Unknown.

Etymology. Ursa Minor is the constellation in the northern sky which contains Polaris, the pole star, which is also the name of the *Salix* species from which the holotype was reared. The species name is to be treated as a noun.

Biology. Host plants: *Salix polaris* and *S. reticulata.*

Distribution. Northern Finland.

Material examined

Holotype ♀ (PR.513VV): Finland, K25/71VV [rearing no.], Lapin Lääni, Saana, 69.050°N 20.850°E, 24.07.1971, reared ex catkin *Salix polaris*, leg. V. Vikberg (MZH).

Paratypes. Finland: 1♀ (PR.497VV), data as for holotype (SDEI). 1♀ (DEI-GISHym31946), locality as for holotype, 01.01.1971–31.12.1971, emerged 05.02.1972, ex larva *Salix reticulata*, leg. E. O. Peltonen (MZH). 2♀ (PR.514VV; PR.496VV), locality as for holotype, 27.07.1971, ex larva *Salix reticulata*, leg. V. Vikberg (VVT). 1♀ (DEI-GISHym31945), locality as for holotype, 01.01–31.12.1982, emerged 21.03.1983, ex larva *Salix reticulata*, leg. J. Kangas (MZH).

Undetermined taxa

Euura amentorum **group sp. on** *Salix pentandra* **(*Euura* TN-2022 in GenBank)**

Norway: 1 larva (210053_NWL), Finnmark, Svanvik 2 km W, 69.457°N 30.001°E, in catkin *Salix pentandra*, 29.07.2021, leg. T. Nyman (NIBIO). 1 larva (201291_PGR), Finnmark, Svanvik, 69.459°N 29.996°E, in catkin *Salix pentandra*, 03.09.2020, leg. T. Nyman (NIBIO). 1 pupa (201290_OZV), Finnmark, Svanvik, 69.458°N 30.001°E, in catkin *Salix pentandra*, 03.09.2020, leg. T. Nyman (NIBIO).

Nuclear sequences differ significantly from others so far obtained from *E. amentorum* group specimens. The existence of a species of the *amentorum* group specialised on *Salix pentandra* is highly plausible, because *S. pentandra* flowers and produces catkins much later than any other lowland north European *Salix* species.

Genetic data

COI. Sequences from three specimens are identical and belong to BIN BOLD:ACJ5901, which includes all *amentorum* group species, except *E. freyja* (BOLD:ACG1728). The nearest neighbour, diverging by a minimum of 0%, is *E. dahlbomi*.

Nuclear. Only one sequence available. The nearest neighbour, diverging by a minimum of 0.7%, is *E. dahlbomi*.

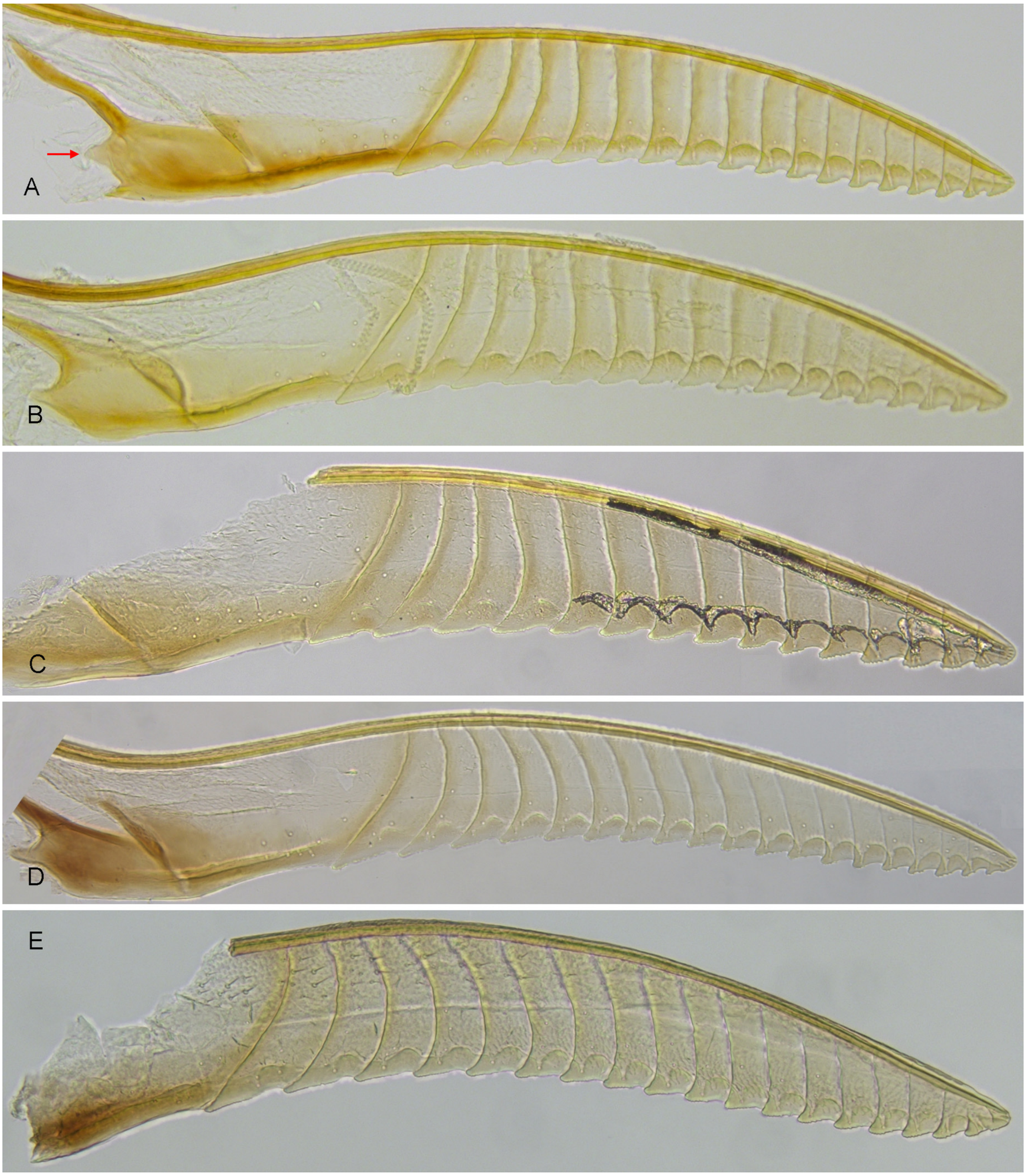

FIGURE 14. Lancets. A–C *Euura amentorum*: A) PR.505VV, lobe projecting from base of tangium arrowed. B) *Nematus suavis* paralectotype DEI-GISHym12674. C) *Pontopristia kamtchatica* lectotype NHRS-HEVA000006355. D–E *Euura latiserra*: D) PR.486VV. E) *Pontopristia latiserra* lectotype NHRS-HEVA000003679.

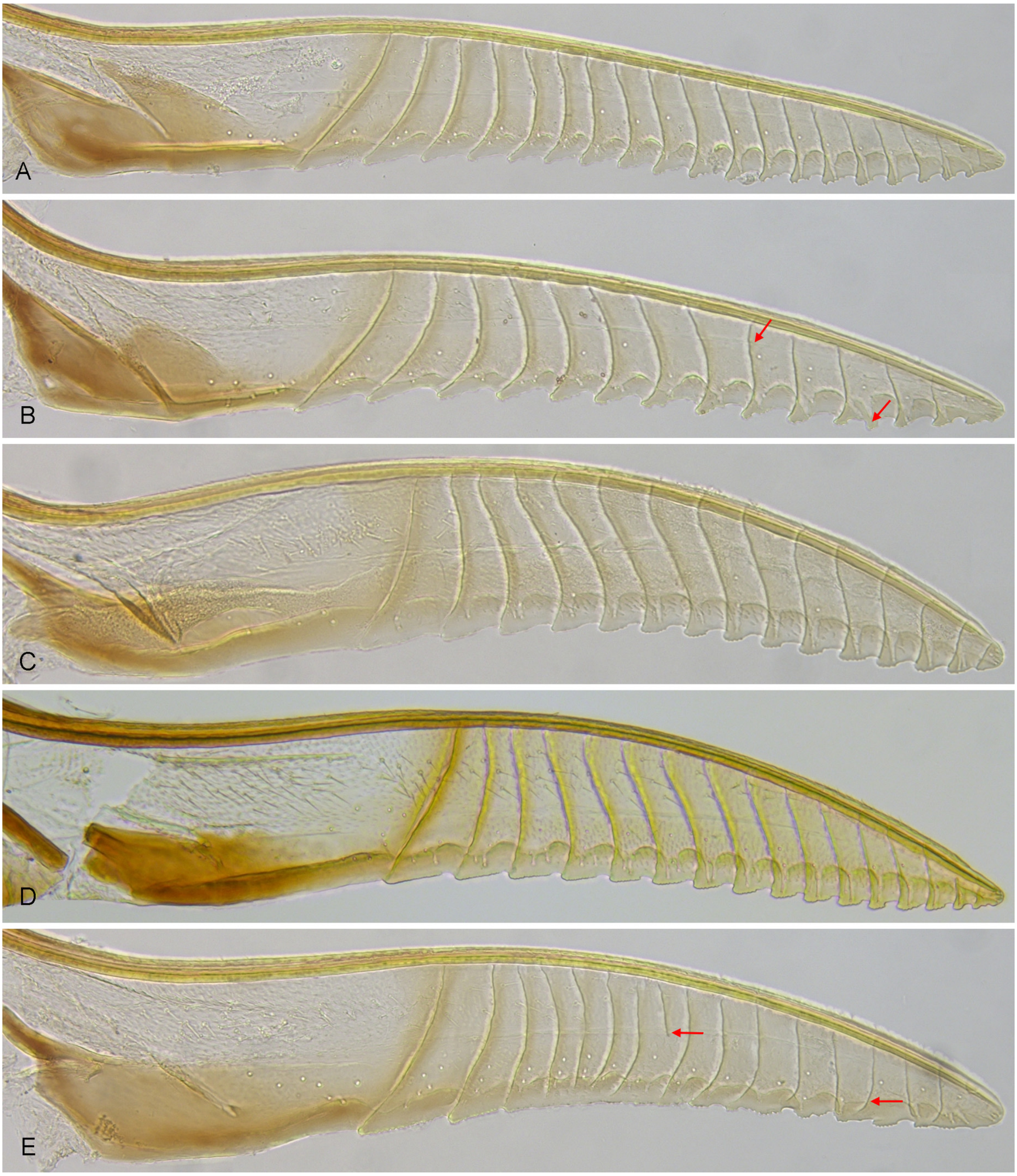

FIGURE 15. Lancets. A–B *Euura ursaminor* **n. sp.**: A) holotype PR.513VV. B) paratype PR.514VV, anomalies in annular sutures and serrulae arrowed. C–E *Euura microphyes*: C) PR.498VV. D) *Amauronematus pyrenaeus* paratype DEI-GISHym12667. E) PR.512VV, anomalies in annular sutures arrowed.

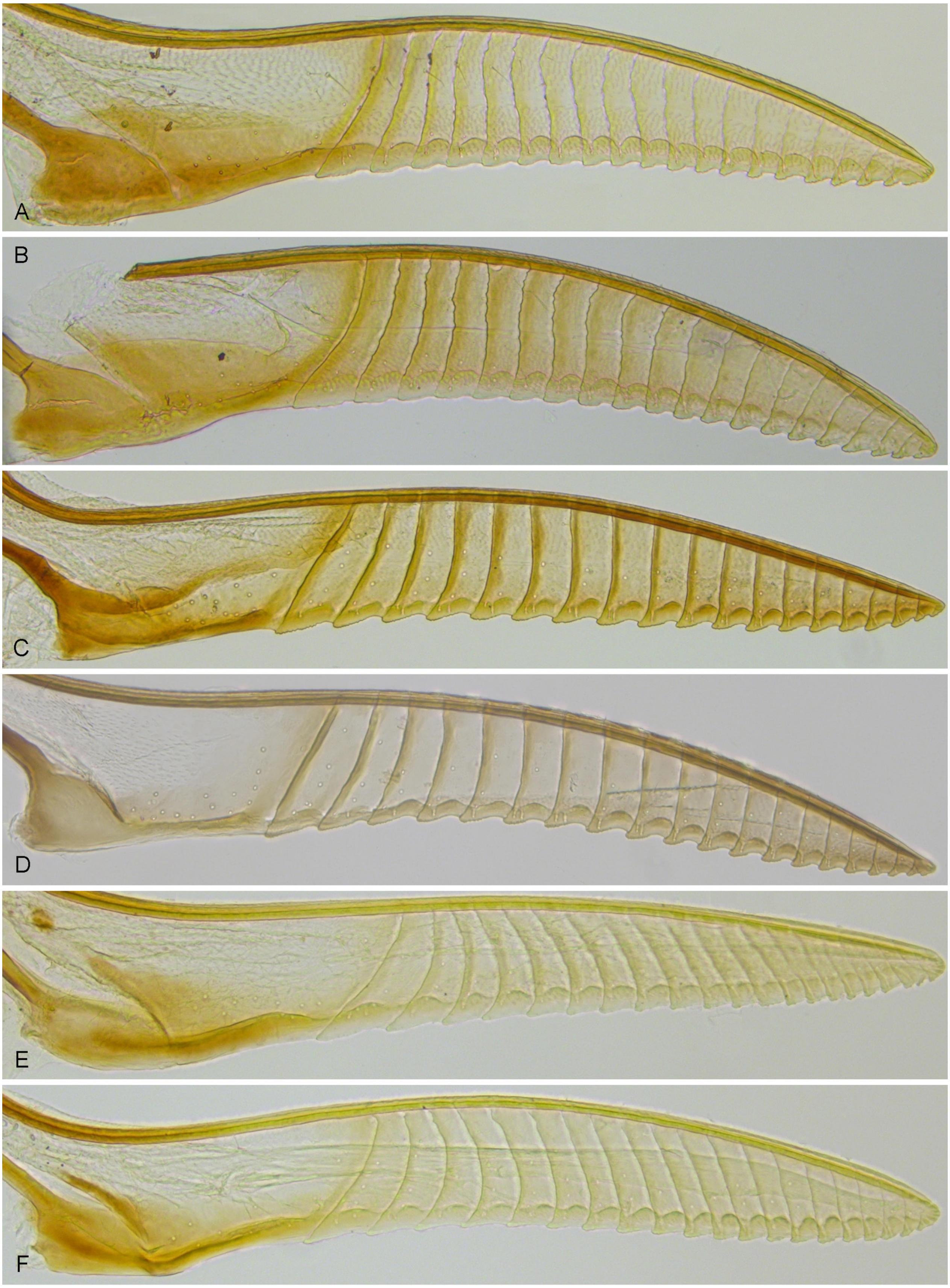

FIGURE 16. Lancets. A–B *Euura freyja*: A) DEI-GISHym31215. B) *Pontopristia analis* holotype http://id.luomus.fi/GL.9215. C–D *Euura pohjola* **n. sp.** C) holotype ZMUO.030866. D) paratype ZMUO.033762. E–F *Euura itelmena* E) *Pontopristia itelmena* lectotype NHRS-HEVA000006352. F) PR.517VV.

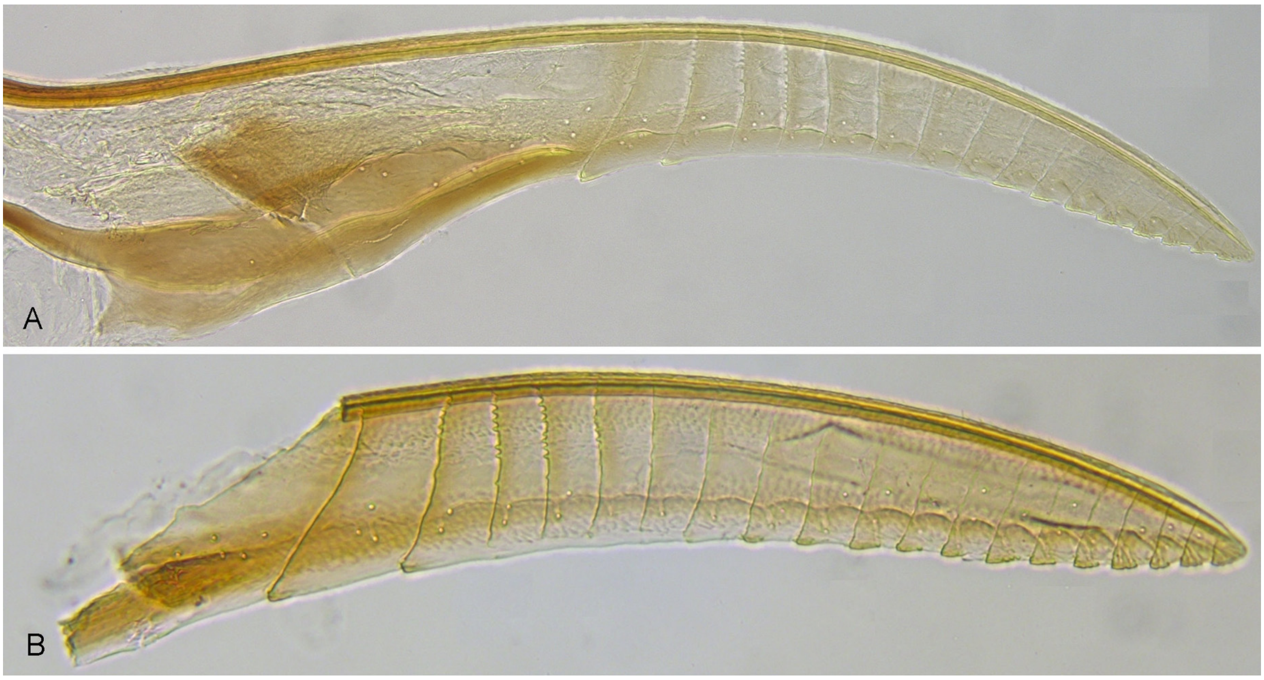

FIGURE 17. Lancets. *Euura dahlbomi*: A) PR.516VV. B) lectotype DEI-GISHym31948.

Discussion

Our initial approach to the species-level taxonomy of the *Euura amentorum* group concentrated on morphological characters of the females, because all primary type specimens are of this sex. However, males of some species in this group possess clearer diagnostic morphological characters, particularly in their penis valve structure, than have so far been found in females. It is therefore regrettable that males of several *E. amentorum* group species are still unknown. To resolve the remaining taxonomic uncertainties, should it be possible to obtain fresh male specimens of additional species, an attempt should be made to associate these with females using gene sequence data. In this context, we emphasise that rearing imagos from larvae is a much more effective way of obtaining specimens than attempting to capture imagos in the field, and also produces data on host-plant associations and other biological traits.

Although we chose to refer to the *Euura amentorum* group as the "willow-catkin sawflies", some other sawflies also interact with the inflorescences of *Salix*. Imagos of many tenthredinoid species in diverse groups feed at *Salix* catkins, consuming both pollen and nectar. The larvae of such species may or may not use willows as host plants. Among the species whose larvae feed on *Salix*, the vast majority consume the leaves and are exophytic, with a sizeable minority endophytic (gall-makers and a handful of leaf-miners) in the leaves, shoots, and buds. Of more relevance in discussing the habits of the *Euura amentorum* group are two other lineages of *Euura* which oviposit into catkins, and whose young larvae apparently at first feed within them. This habit is known for a few species of the *Euura histrio* species group (Schmidt 1997; Liston, personal observations). However, unlike the *amentorum* group, *histrio* group species apparently only oviposit into male catkins, and the young larvae leave these to feed thereafter on the leaves. A similar trait is probably shared by *Euura squamicauda* (Vikberg, 1982): two females were observed by Nyman as it oviposited into a male catkin of *Salix lanata*. Noteworthy is that the ovipositor of *E. squamicauda* is orientated upwards (Viitasaari 1974: as *Pteronidea caudalis* Lindqvist), similarly to most *E. amentorum* group females, but that in dorsal view it has a simple, subtriangular form. It seems that the habit of ovipositing into *Salix* catkins has evolved more than once within the genus *Euura*. Speculatively, reduction in parasitism or predation might have driven the shift to a novel oviposition site, or perhaps the mere availability of a rather abundant source of nutrition, which is presumably protein-rich, is often available earlier than the leaf tissues, and has not been utilised by many other insects. If the latter are important factors, then it seems strange that only a few sawflies use *Salix* catkins in this way.

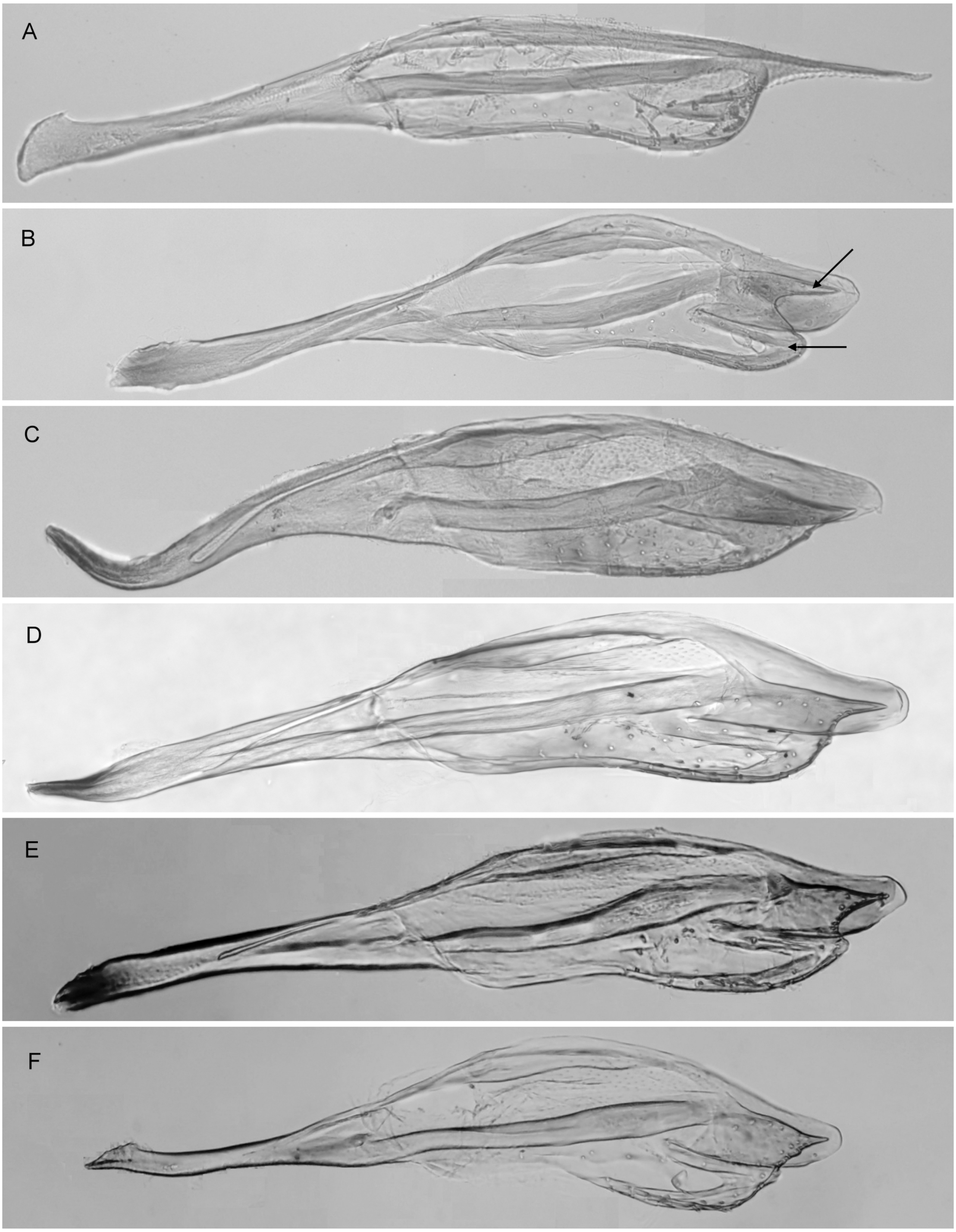

FIGURE 18. Penis valves. A) *Euura amentorum* http://id.luomus.fi/GP.110189. B) *E. pohjola* **n. sp.** paratype ZMUO.030821, valvispina (upper) and lobe on paravalva (lower) arrowed. C) *E. dahlbomi* http://id.luomus.fi/GP.110188. D) *E. microphyes* 00244_KTP. E) *E. freyja*, 200693_BSP. F) *E. freyja* ZMUO.058316.

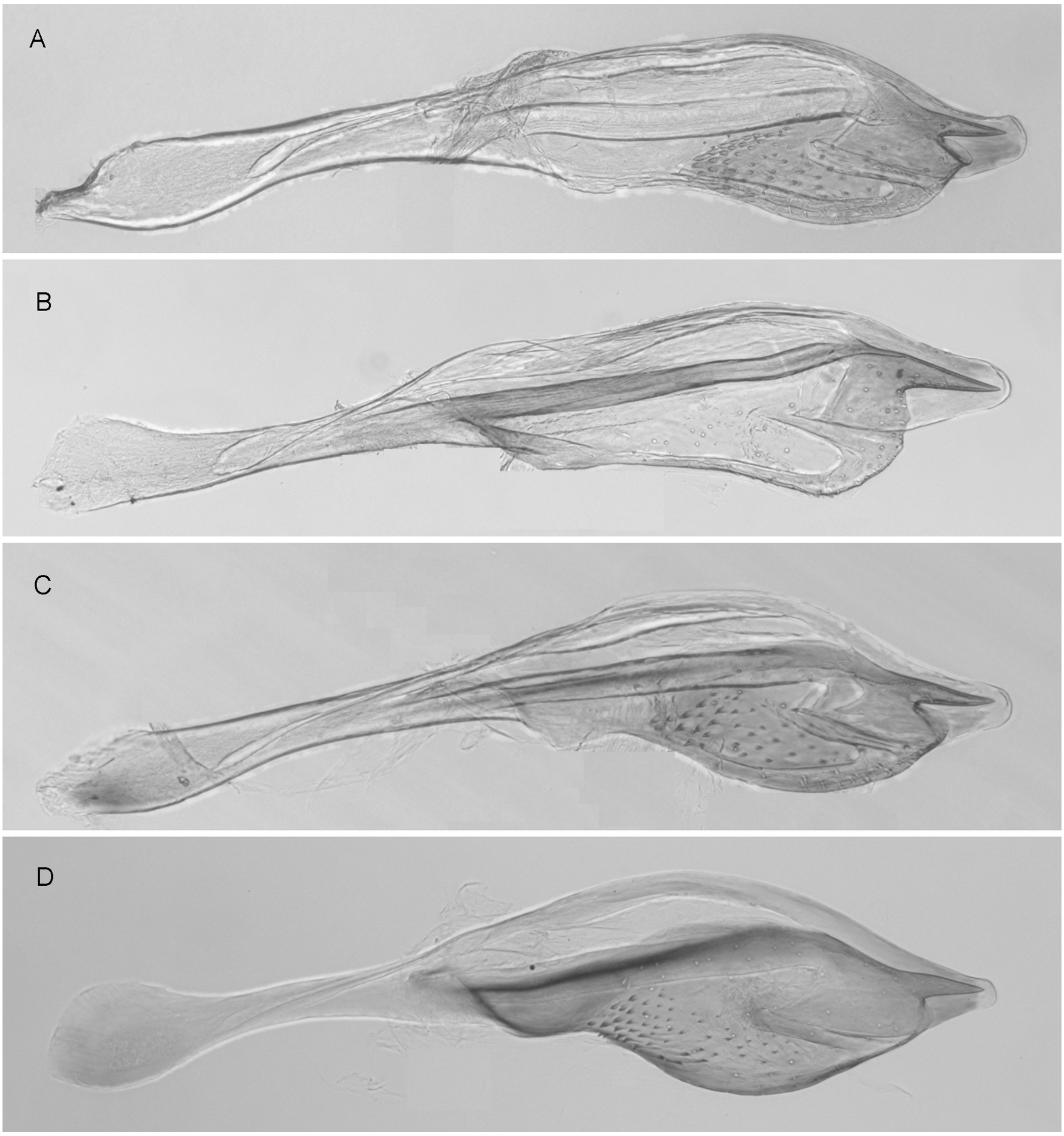

FIGURE 19. Penis valves. A) *Euura flavescens* DEI-GISHym84191. B) *Euura leucopyga* DEI-GISHym84254. C) *Euura lienterica* DEI-GISHym88729. D) *Euura reticulata* PR.598VV.

In northern Europe, population densities of some species of the *Euura amentorum* group are occasionally high, at least locally. Large numbers of larvae can then be found on single *Salix* bushes, or groups of bushes within a small area (Fig. 20B), with most catkins inhabited and up to about twenty larvae in the same catkin. Such observations have so far mostly involved *E. amentorum*. Benson (1959) evidently encountered such an "outbreak" of *E. amentorum* near Inchnadamph, north-west Scotland. He recorded netting over 200 adults, including three males, and that during a visit to the same locality about two weeks later, the female catkins of *Salix myrsinites* and *S. myrsinites* × *repens* were "riddled with the larvae". It seems likely that the reproductive success of the host is adversely affected when larvae are so abundant. However, compared to some species of *Egle*, which have regularly been observed in very large numbers (Michelsen 2009), both as larvae and adults, the effect of *amentorum* group species on their hosts is probably generally less significant.

FIGURE 20. *Euura amentorum* group. A–C Feeding signs on female *Salix* catkins: A) *E.* ? *amentorum*, *S. lapponum*, Norway, Svanvik, 1.7.2019, note larva outside the catkin (arrow). B) *E. amentorum*, *S. myrsinites*, Finland, Kuusamo District, 13.6.2018. C) *E.* ? *freyja*, *S. myrsinifolia*, Norway, Austertana, 4.7.2020. D) *E.* ? *amentorum*, *S. phylicifolia*, Finland, Oulu, 6.6.2007, protruding dorsal annulets (arrows). E) *E. amentorum* last instar larvae (green body) and prepupae (brownish body), from a single catkin of *S. lapponum*, Finland, Tolva, 9.6.2018. F) *E. amentorum* DEI-GISHym84387 prepupa, antenna (arrow).

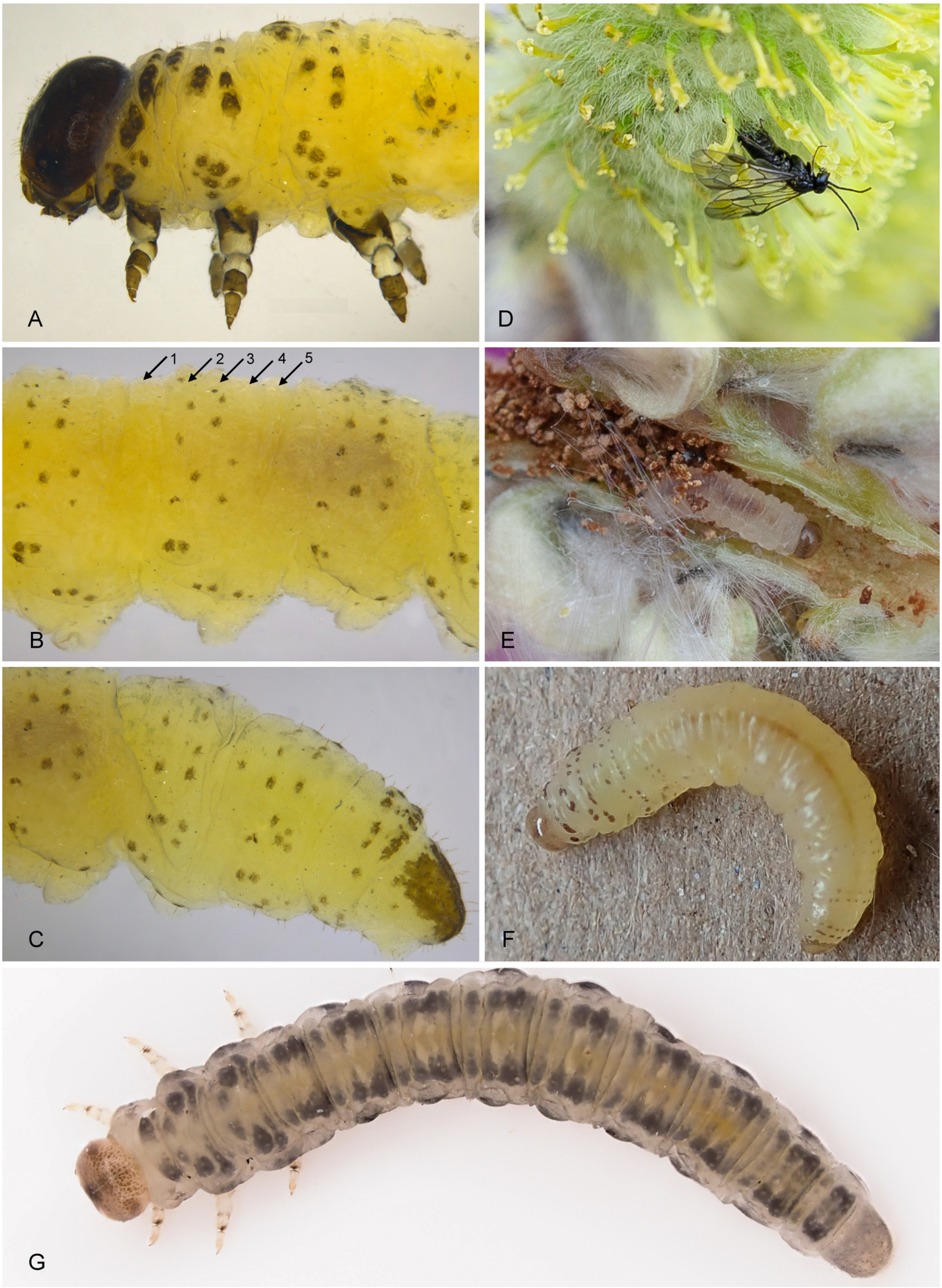

FIGURE 21. *Euura amentorum* group. A–C *E. amentorum* DEI-GISHym84386 last instar larva, in ethanol: A) head and thorax. B) abdominal segments 3–5, seg. 4 dorsal annulets arrowed. C) tip of abdomen. D) *E. itelmena* 210010_NBH ovipositing in *S. lanata* catkin. E) unidentified species, larva boring in catkin axis of *S. lapponum*, Norway, Svanvik, 9.7.2019. F) *E.*? *freyja* larva, *S. lanata*, Norway, Skallelv, 16.7.2019. G) *E.*? *freyja* prepupa, *S. myrsinifolia*, Norway, Båtsfjord, 9.7.2021.

Only two described species of the *Euura amentorum* group might be strictly monophagous on single *Salix* species: *E. latiserra* (*S. lanata*) and *E. pohjola* (*S. lanata*). Even in these cases, insufficient sampling might be the reason why they have so far been recorded from only a single host species. *Euura itelmena* would also have been considered a monophage (on *S. lapponum* and its nearest relatives) were it not for a single record of it ovipositing in *S. lanata*. The known host range of *E. dahlbomi* currently comprises only *S. glauca* and *S. lapponum*. This is surprising, because where they grow at the same localities or climatically similar localities their flowering periods barely overlap. While not wishing to overrate the significance of the single definite record from *S. lapponum*, we note that this is from the relatively temperate Kuusamo District, and below the treeline, whereas all the other records of *E. dahlbomi*, including several rearing records from *S. glauca*, are from further north and are tundra localities above or north of the treeline. This raises the question of whether the host range of an individual *amentorum* group species is influenced by climatic variables, perhaps linked to the geographic position of a locality, which in turn affect the relative phenology of the potential host species. In view of this uncertainty, it is premature to speculate that the unidentified *amentorum* group species on *Salix pentandra* is a specialized monophage, although the unusually late flowering period of that willow species suggests that it could be.

The eight species treated here all occur in Europe. Six of these are also recorded in East Palaearctic Russia, and three in the Nearctic. Worldwide, no additional species are currently recognized as belonging to this group. We hope that further studies on material from North America and eastern Asia will shed more light on their global diversity and distribution.

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