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On Bulgarian sawflies, including a new species of *Empria* (Hymenoptera, Symphyta)

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Abstract

Thirty-nine species of sawfly (Symphyta) are recorded for the first time in Bulgaria. Most of these were collected during early spring of 2018, in the south-east of the country (Burgas and Varna Provinces). *Empria aridicola* Macek & Prous, **sp. nov.** is described as new to science from specimens collected in several central, east and south European countries. Lectotypes are designated for *Poecilosoma parvula* Konow, 1892, *Empria pravei* Dovnar-Zapolskij, 1925 and *E. pseudoklugi* Dovnar-Zapolskij, 1929. *Empria pravei* and *Sciapteryx byzantina* Benson, 1968 are at present only known in Europe from the coastal zone of the Black Sea. The new Bulgarian records of *Hoplocampa cantoti* Chevin, 1986 and *Neomessa steusloffi* (Konow, 1892) represent large extensions in their recorded ranges, previously comprising respectively only northern France, and north-eastern Germany. Possible host plant associations are noted for several species, based on observations of adults.

Key Words

Cephoidea
distribution
Euxinian Province
host plants
Insecta
Pamphilioidea
Siricoidea
taxonomy
Tenthredinoidea
Xyeloidea

Introduction

The first modern inventory of sawflies (Symphyta) recorded in Bulgaria was by Hellén (1967) who listed 107 species. After the publication of several subsequent works on the Bulgarian sawfly fauna, most significantly those by Vassilev (1978), Meitzner and Taeger (1982), and Taeger (1987), the number of recorded species rose to 346 definitely present, and two in need of confirmation, as collated in a survey of the European sawfly fauna (Taeger et al. 2006). However, published records of some species already recorded in Bulgaria were overlooked during the compilation of the latter work (Georgiev 1990; Stoyanov and Ljobomirov 2000; Georgiev et al. 2002, 2004), and a small number of other species have been added since 2006 (Georgiev 2006; Blank et al. 2013; Doychev 2015). Nevertheless, the total number of species known in Bulgaria remains rather low considering the high diversity of habitats and climatic zones in the country. By comparison, Taeger et al. (2006) listed 469 species from Hungary and 486 from Romania.

In an effort to fill part of this knowledge gap, MP and AL collected in Bulgaria from 31 March to 14 April 2018. The dates were chosen with the intention of finding phenologically early species, sampling of which we suspected to have been previously relatively neglected in the country. We collected mainly in south-eastern Bulgaria, generally not far from the Black Sea, in the Burgas and Varna provinces, except for some localities further inland, in Pazardzhik and Sliven provinces, which were visited during the journeys respectively from and to Sofia airport. The localities in Burgas Province, therefore, lie within the rather ill-defined Euxinian biogeographic province, which extends along the western Anatolian Black Sea coast, and northwards through the Thracian coastal areas of Turkey into Bulgaria north to about Ropotamo or Burgas (Browicz 1989). Although many organisms are considered to occur in Europe only within this zone (Fet and Popov 2007), no special effort has hitherto been made, as far as we are aware, to investigate its sawfly fauna. As a matter of convenience, records of two additional noteworthy species are included; these records are from other Bulgarian provinces and were based on specimens examined in the private collection of Matti Viitasaari (Helsinki) and the Swedish Museum of Natural History (Stockholm). We used the results of DNA sequencing to answer questions on the taxonomy and phylogeny of several rarely collected taxa.

Material and methods

Collections were made mainly by sweeping, using hand nets with handles extendable to about 2 m to reach into shrubs and the lower branches of trees. Unless otherwise stated, all specimens referred to are in the collection of the Senckenberg Deutsches Entomologisches Institut (Müncheberg) and were collected and determined by A. Liston and M. Prous. Accession numbers (DEI-GISHym[and five numerals]) are given for some vouchers which are figured, or for which genetic sequences were obtained and / or genitalia examination undertaken [with databased images].

The newly obtained DNA sequences were sequenced as described previously (Prous 2012; Prous et al. 2017, 2019). Additional primers used for sequencing that are not mentioned in Prous (2012) and Prous et al. (2017, 2019) were as follows:

NaK_1250Fv2	ATGTGGTTYGAYAAYCARATHATIGA
POL2_467F	ATHTGYGARGGNGGNGAYGARATGGA
POL2_1732R	GARAADATYTGYTTNCCNGTCCA
POL2_2569R	TGNACCATNACNGAYTCCATAGCYTTDAT.

For most specimens, one mitochondrial and two nuclear genes were sequenced. The mitochondrial gene used is complete (1536 bp) or partial (1078–1119 bp) cytochrome c oxidase subunit I (COI). The two nuclear markers are fragments of sodium/potassium-transporting ATPase subunit alpha (NaK, 1654 bp) and DNA dependent RNA polymerase II subunit RPB1 (POL2, 2495–2717 bp). The NaK fragment does not include any introns, but POL2 has one short intron (86–99 bp) that was excluded from phylogenetic analyses. When excluding the intron in POL2, the alignment of all genes was straightforward because of the lack of insertions or deletions in the studied specimens (length differences were only due to the extent the gene regions were amplified and sequenced). Some of the analysed sequences were published previously by Prous et al. (2011), Prous and Heidemaa (2012), Leppänen et al. (2012), Malm and Nyman (2015), and Schmidt et al. (2017). Additionally, a few of the COI sequences were obtained from BOLD (http://www.boldsystems.org/). The newly obtained DNA sequences have been submitted to NCBI GenBank (accessions MK561857– MK561967 and MK574673–MK574674). Phylogenetic analyses using maximum likelihood (ML) were done with IQ-TREE 1.5.6 (http://www.iqtree.org/) (Nguyen et al. 2015). By default, IQ-TREE runs ModelFinder (Kalyaanamoorthy et al. 2017) to find the best-fit substitution model and then reconstructs the tree using the model selected according to Bayesian information criterion (BIC). We complemented this default option with a SH-like approximate likelihood ratio (SH-aLRT) test (Guindon et al. 2010) and ultrafast bootstrap (Hoang et al. 2018) with 1000 replicates to estimate robustness of reconstructed splits.

Additional abbreviations used in the text are:

CMH	Collection of Mikk Heidemaa, Tartu, Estonia
MNHN	Muséum National d'Histoire Naturelle, Paris, France
MT	Malaise trap
NMPC	National Museum, Praha, Czech Republic
NNR	National Nature Reserve
NR	Nature Reserve
PLA	Protected Landscape Area
SDEI	Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany
TUZ	Natural History Museum, University of Tartu, Tartu, Estonia;
USNM	National Museum of Natural History, Smithsonian Institution, Washington DC, USA
ZIN	Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia
ZSM	Zoologische Staatssammlung, München [= Munich], Germany

Results and species commentaries

Taxa are listed in alphabetical order. Species for which we know of no previously published record for Bulgaria are indicated by an asterisk [*].

Argidae

Sterictiphora geminata* (Gmelin, 1790)

Material. Varna: 1♂ (DEI-GISHym88789), Tsonevo 5 km S, 100 m, 42.982N, 27.451E, 03.04.2018.

Sterictiphora geminata has a wide Palaearctic distribution (Sundukov 2017), including North Africa (Lacourt 1986).

Sterictiphora longicornis* Chevin, 1982

Material. Burgas: 1♂, Mrezhichko 1 km W, 370 m, 42.860N, 27.397E, 07.04.2018. 1♂ (DEI-GISHym88832), Primorsko 4 km NW, 20 m, 42.300N, 27.729E, 10.04.2018. 1♀, Indzhe Voivoda 3 km NE, 250 m, 42.235N, 27.451E, 12.04.2018.

Varna: 1♂ (DEI-GISHym88750), Tsonevo 5 km S, 100 m, 42.982N, 27.451E, 03.04.2018. 1♂, locality as previous, 06.04.2018. 1♀,1♂, locality as previous, 08.04.2018. 1♂, Dolni Chiflik 2 km SE, 50 m, 42.983N, 27.743E, 05.04.2018. 2♀, Staro Oryahovo 2 km SW, 120 m, 42.976N, 27.787E, 08.04.2018. 1♂, locality as previous, 09.04.2018. 1♂, locality as previous, 11.04.2018. 1♂, Goren Chiflik 1 km SW, 40 m, 43.001N, 27.621E, 13.04.2018.

Although the hosts of other *Sterictiphora* species, as far as they are known, are all woody species of Rosaceae, *S. longicornis* was recorded by Macek (2012) as having been reared from *Carpinus betulus* L. All of the specimens which we collected in Bulgaria were netted within woodland dominated by *Carpinus*.

The previously recorded range of this species is mainly in Central Europe, with a single record from "Yugoslavia" (Taeger et al. 2006). The latter record is based on 1♂, Serbia, Beograd, Avala, 500 m, 26.03.2001, leg. Z. Nikolić, det. A. Taeger (Z. Nikolić Collection, University of Belgrade).

Diprionidae

Gilpinia frutetorum* (Fabricius, 1793)

Material. Varna: 1♀ (DEI-GISHym84162), Tsonevo 5 km S, 100 m, 42.982N, 27.451E, 03.04.2018.

Gilpinia frutetorum has a very extensive range in Europe, extending through Asia Minor to eastern Siberia, and by introduction in North America (Sundukov 2017).

Pamphiliidae

Pamphilius marginatus* (Serville, 1823)

Material. Burgas: 1♂, Primorsko 4 km NW, 20 m, 42.300N, 27.729E, 10.04.2018. 1♀ (DEI-GISHym88850), Indzhe Voivoda 3 km NE, 250 m, 42.235N, 27.451E, 12.04.2018.

Varna: 1♀, Staro Oryahovo 2 km SW, 120 m, 42.976N, 27.787E, 11.04.2018.

Only recorded in central and southern Europe, including various Balkan countries (Viitasaari 2002).

Tenthredinidae

Ardis pallipes* (Serville, 1823)

Material. Burgas: 1♂, Primorsko 4 km NW, 20 m, 42.300N, 27.729E, 04.04.2018. 1♀, 1♂ (DEI-GISHym88780), Prosenik 1 km NW, 150 m, 42.805N, 27.436E, 07.04.2018.

Varna: 1♀, Staro Oryahovo 2 km SW, 120 m, 42.976N, 27.787E, 09.04.2018. 1♂, Goren Chiflik 1 km SW, 40 m, 43.001N, 27.621E, 13.04.2018.

Ardis pallipes has an extensive Holarctic distribution (Lacourt 1999), but is found in the Nearctic probably through introduction.

Empria aridicola* Macek & Prous, sp. nov.

http://zoobank.org/70BA4DE0-9FB8-465E-B78C-387D882944BF

Description of the holotype (variability in other specimens in parentheses).

Male (Figs 9–15).

Body length. 5.2 (5.1–6.0) mm.

Colour. Black; following parts white or pale brown: (anterior and posterior margins of tegula); posterior margin of pronotum; profemur apically; anterior of protibia and posterior slightly (posterior completely black); anterior of mesotibia; (base of metatibia slightly); large triangular membranous area on tergum 1; posterior margins of terga and sterna slightly; cenchri; and paired patches on posterior margins abdominal terga 2–4 (2–3).

Head. Clypeus tridentate, with rather inconspicuous median keel, and median tooth smaller than lateral teeth; head behind eyes in dorsal view parallel to subparallel with posterior halves converging toward the occipital carina; area between frontal crests in dorsal view reaching (slightly exceeding) the level of crests; malar space 1.2 (0.9–1.3) times as long as the frontal ocellar diameter; length of postocellar area 2.2 (1.8–2.7) times as long as the lateral ocellar diameter; postocellar area 2.2 (1.9–2.4) times as wide as long; flagellum 1.9 (1.8–2.3) times as long as breadth of head.

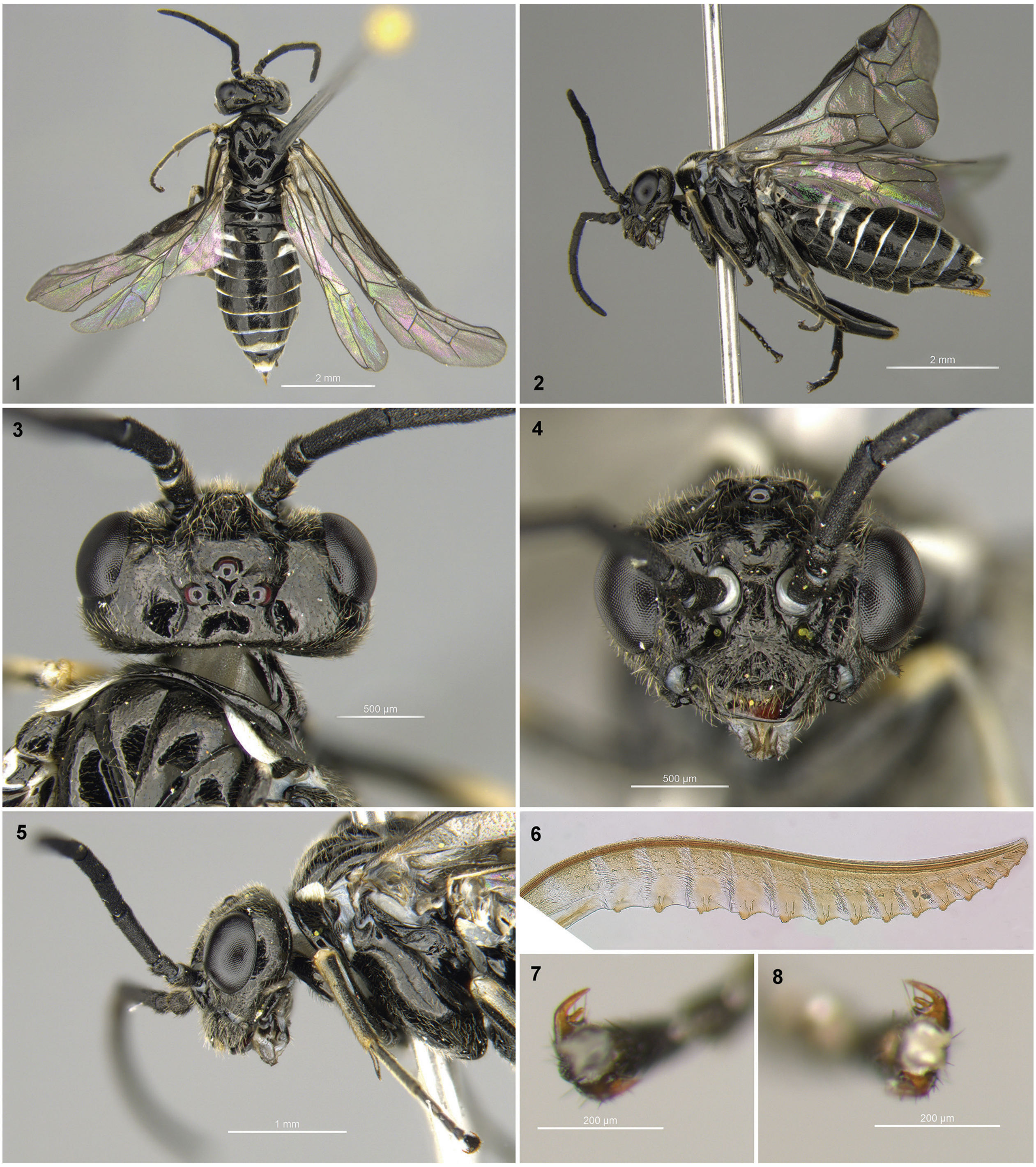
Thorax. Propleura not meeting in front; distance between cenchri slightly longer than (as long as) cenchrus width; wings smoky (hyaline), venation brown; vein 2A+3A of fore wing complete; vein m-cu in hind wing present; subbasal tooth of tarsal claw close to apical one and distinctly shorter.

Abdomen. Subgenital plate (sternum 9) without emargination. Penis valve with distinct spine subapically at dorsal margin of valviceps; valviceps slightly longer than (as long as) valvura; ventral margin of valviceps distinctly concave; dorsal margin of valviceps with few teeth and its basal and apical part bending similarly, forming nearly semicircle; valvar strut slightly curved.

Female (Figs 1–8).

Body length. 5.9–6.9 mm.

Colour. Black; following parts white or pale brown: anterior and posterior margins of tegula, or completely black; posterior margin of pronotum; profemur apically; protibia anteriorly and sometimes slightly posteriorly; mesotibia anteriorly; metatibia slightly basally or completely black; large triangular membranous area on tergum 1; posterior margins of terga and sterna slightly; cenchri; and paired patches on posterior margins abdominal terga 2–3 or 2–4.

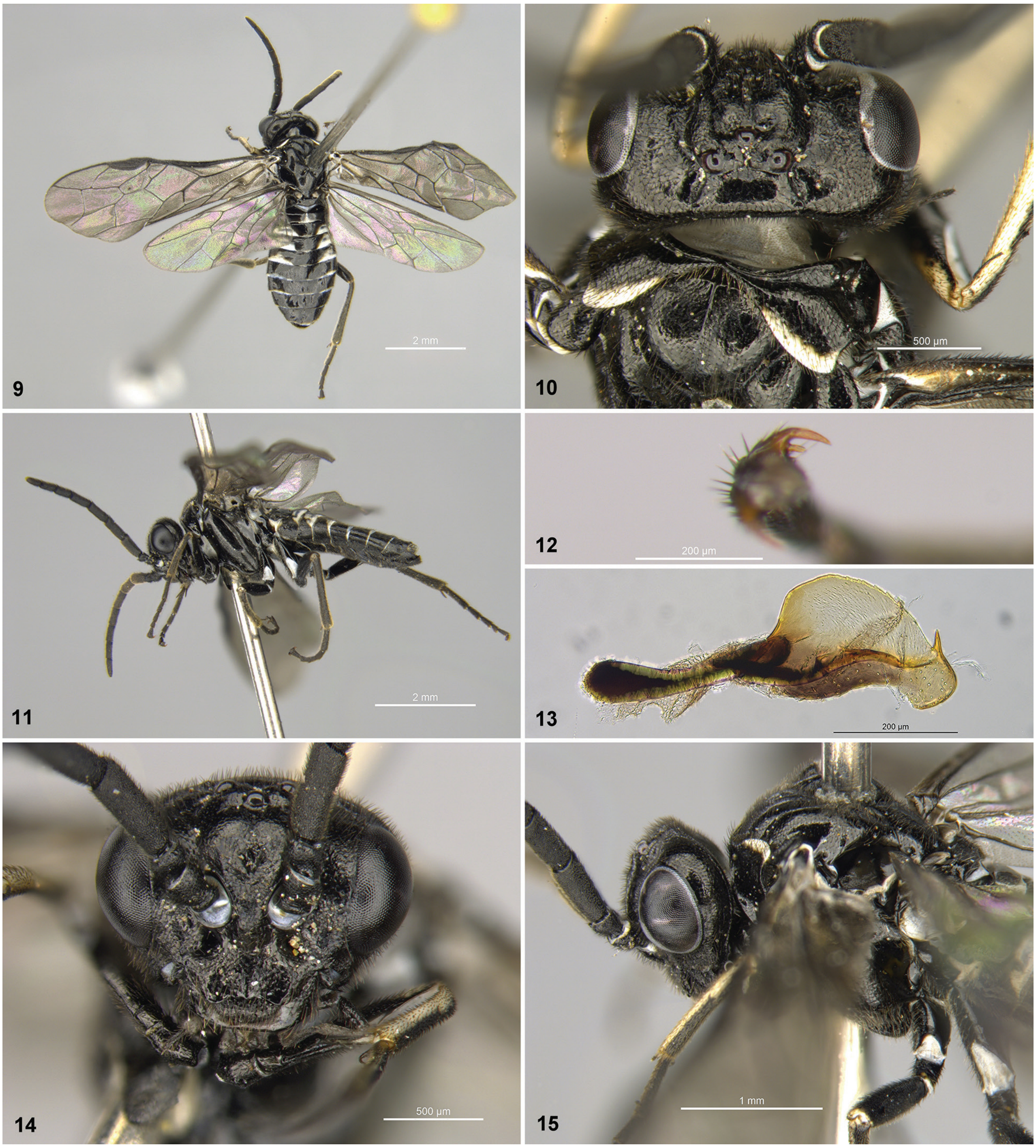


Figures 1–8. *Empria aridicola* female paratypes, DEI-GISHym80378 (**1–5, 7, 8**) and DEI-GISHym15134 (**6**). **1** body dorsal **2** body lateral **3** head dorsal **4** head frontal **5** head and thorax lateral **6** saw **7, 8** tarsal claws.

Head. Clypeus tridentate, with rather inconspicuous median keel, and median tooth smaller than lateral teeth; head behind eyes in dorsal view parallel to subparallel with posterior halves converging toward the occipital carina; area between frontal crests in dorsal view reaching or slightly exceeding the level of crests; malar space 1.2–1.5 times as long as the frontal ocellar diameter; length of postocellar area 2.1–2.6 times as long as the lateral ocellar diameter; postocellar area 1.8–2.4 times as wide as long; flagellum 1.6–1.9 times as long as breadth of head.

Thorax. Propleura not meeting in front; distance between cenchri as long as or slightly longer than cenchrus width; wings hyaline or smoky, venation brown; vein 2A+3A of fore wing complete; vein m-cu in hind wing present; subbasal tooth of tarsal claw close to apical one and distinctly shorter.

Abdomen. Sawsheath simple, narrow in dorsal view and distinctly longer than cerci. Lancet with 14 or 15 serrulae, more or less triangular with microdenticles at anterior margin.



Figures 9–15. *Empria aridicola* male holotype, DEI-GISHym12004. **9** body dorsal **10** head dorsal **11** body lateral **12** tarsal claw **13** penis valve **14** head frontal **15** head and thorax lateral.

Holotype. 1♂, DEI-GISHym12004, Bulgaria, Varna, Goren Chiflik 1 km SW, 43.001N, 27.621E, 40 m, 13.4.2018, leg. A. Liston & M. Prous (SDEI).

Paratypes. BULGARIA: 3♂, Burgas, Indzhe Voivoda 3 km NE, 42.235N, 27.451E, 250 m, 12.4.2018, leg. A. Liston & M. Prous (SDEI); 2♂ (one with ID number DEI-GISHym88915), Varna, Tsonevo 5 km S, 42.982N, 27.451E, 100 m, 8.4.2018, leg. A. Liston & M. Prous (SDEI).

CZECH REPUBLIC: 2♀, 1♂, Bohemia or., Chlumec nad Cidlinou env., Báň NR, 24.04. –30.04.2001, MT, leg. B. Mocek (NMPC); 1♂, Bohemia cent., Milovice, 5.05.2006, swept, leg. J. Macek (NMPC); 1♀, Bohemia cent., Karlštejn NNR, 24.04.2011, swept, leg. J. Macek (NMPC); 1♂, Moravia mer., Bílé Karpaty PLA, Čertoryje NNR, 29.05.2005, MT, leg. J. Macek (NMPC); Moravia mer.: 3♀, Dolní Dunajovice, 10.04.2017, swept, leg. V. Kubáň (NMPC).

FRANCE: 1♀, MNHN_Empria_82, Picardie, Laigneville, 49.3N. 2.45E (MNHN); 1♂, MNHN_Empria_7, Ile-de-France, Lardy, 48.517N, 2.267E, 6.6.1913 (MNHN); 2♂, MNHN_Empria_72 and MNHN_Empria_73, Rhone-Alpes, Rochecolombe, 44.5N, 4.45E, 8.4.1951

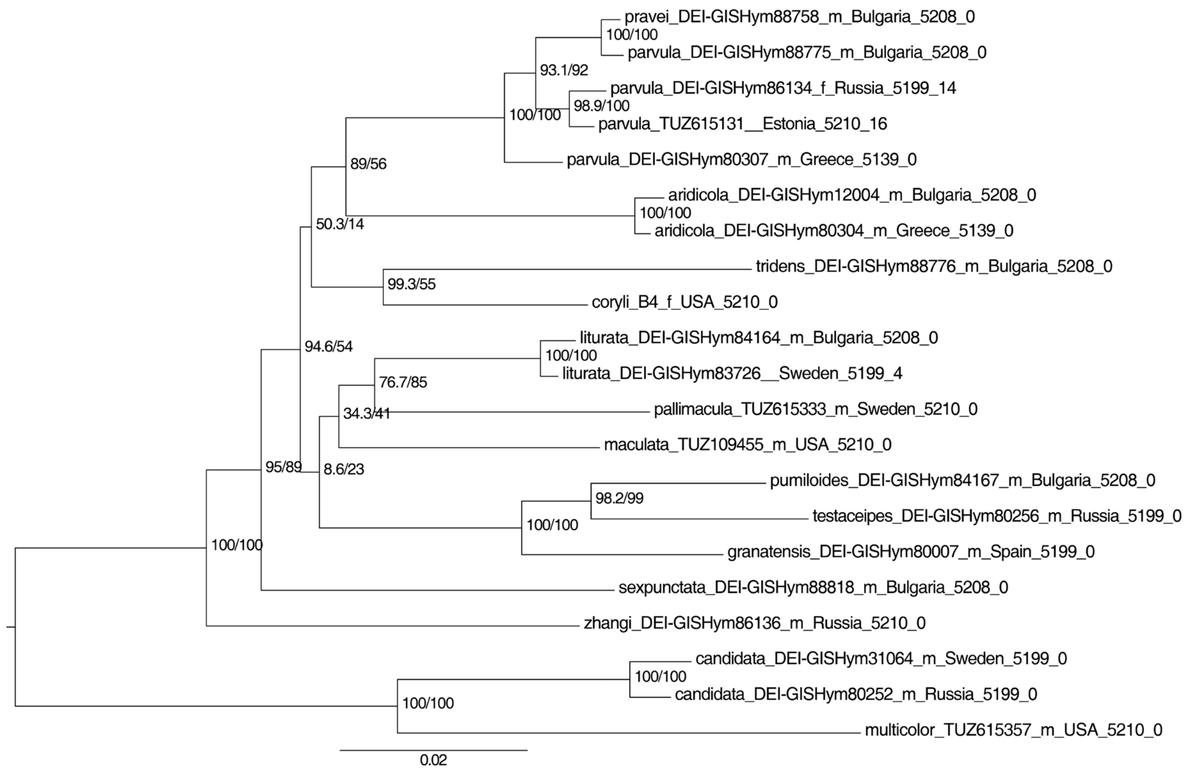


Figure 16. Maximum likelihood tree of *Empria* based on three genes. Best-fit model chosen according to Bayesian information criterion was GTR+R3. Numbers beside nodes show SH-aLRT support (%) / ultrafast bootstrap support (%) values. Support values for weakly supported branches (<90) are not shown. Letters "f" and "m" stand for "female" and "male". Numbers at the end of the tip labels refer to the length of the sequence and the number of ambiguous positions (e.g. polymorphisms). *Empria candidata* and *E. multicolor* were used to root the tree. The scale bar shows the number of estimated substitutions per nucleotide position.

(MNHN); 1♀, BC ZSM HYM 04606, Alsace, Mulhause, Westhalten, 47.967N, 7.267E, 327 m, 6.4.1999, leg. C. Schmid-Egger (ZSM).

GERMANY: 1♂, Brandenburg, Drehna, Weinberg, 51.767N, 13.8E, 13.5.1980, leg. J. Oehlke (SDEI); 1♂, Brandenburg, Kleiner Rummelsberg, Nordhang, 1.M, 52.917N, 14.017E, 27.4.1993–29.4.1993, leg. M. Sommer, Malaise trap (SDEI); 1♀, Thüringen, Lausnitz, FND Totenstein, Hecke, 50.733N, 11.678E, 28.4.2009, leg. F. Burger (SDEI); 1♂, Brandenburg, Mallnow, Oderhänge, NSG Adonishänge, 52.45N, 14.5E, 1.5.2013, leg. A.D. Liston (SDEI); 1♂, BC ZSM HYM 04610, Bayern, Auwald b. Breitenfurt, 49.137N, 11.447E, 390 m, 5.4.2009, leg. J. Hable (ZSM); 1♂, BC ZSM HYM 16743, Bayern, Magerrasen zw. Grossbissendorf und Hohenfels, 49.215N, 11.827E , 435 m, 2.5.2012, leg. J. Hable (ZSM); 1♀, BC ZSM HYM 11775, Bayern, Neumarkt, TK 6834, Qu. 4, S-exponierter Hang, Berching NW-Rand, Haarbe, 49.105N, 11.442E, 388 m, 10.4.2011, leg. J. Hable (ZSM); 1♂, BC ZSM HYM 11810, Bayern, Neumarkt, TK 6934, Qu. 2, Kreuzberg, noerdl. Ortsrand von Dietfurt, 49.04N, 11.586E, 453 m, 21.4.2011, leg. J. Hable (ZSM); 1♂, BC ZSM HYM 04613, Bayern, Zeil, 50.010N, 10.594E, 229 m, 7.7.1998, leg. K. Mandery (ZSM).

GREECE: 1♂, DEI-GISHym80304, Achaia, Ano Vlasia 4 km S, 37.97N, 21.894E , 1000 m, 24.4.2017, leg. SDEI Hym-group (SDEI); 1♀, DEI-GISHym80378, Achaia, Kalavryta Ski Center, 38.005N, 22.199E, 1700 m, 27.4.2017, leg. SDEI Hym-group (SDEI); 2♀ (DEI-GISHym15134 and DEI-GISHym15131), 1♂ (DEI-GISHym15132), Ioánnina, Kónitsa E 1km, 40.043N, 20.767E, 870 m, 10.5.2007, leg. M. Wei (SDEI); 1♂, DEI-GISHym80396, Sterea Ellas, Lamia W 48 km, Timfristos SW 3 km, 38.91N, 21.93E, 1101 m, 11.5.2007, leg. A.D. Liston (SDEI); 1♀, Achaia, Pirgaki 2 km NNW, 38.178N, 22.084E , 750 m, 25.4.2017, leg. SDEI Hym-group (SDEI); 1♂, TUZ109463, Sterea Ellas, Timfristos Oros, East flank, 38.95N, 21.817E , 1700 m, 14.4.2008, leg. A.D. Liston (TUZ).

HUNGARY: 8♂, 1♀, Tokód, 16.04.2005, swept, leg. J. Macek; 1♀, Epöl, 16.04.2005, swept, leg. J. Macek (NMPC); 1♂, Pest, Veroce, 47.826N, 19.022E, 122 m, 1.5.2005–10.5.2005, leg. Z. Nyiro, Malaise trap (USNM).

RUSSIA: 1♀, I02-01a, Ulyanovsk Oblast, Radishchevsky, 8 km S Vjazovka ("Радищевский р-н 8 Ю с. Вяазовка"), 2.5.2002, leg. A. Isajev (CMH).

SLOVAKIA: 1♀, Slovakia mer., Devínska Kobyla, 6.v.1982, swept, leg. J. Macek (NMPC).

Etymology. The species name, a noun, is formed from the Latin components *aridus* (dry) and the suffix *-cola* (inhabitor), and refers to its occurrence in dry places.

Genetic data. Based on mitochondrial and nuclear genes, the exact placement within *Empria* s. str. (i.e. excluding *E. candidata* and *E. multicolor*) is not well supported (Fig. 16). According to mitochondrial COI barcodes, all the specimens belong to the same BIN, the nearest neighbour being a BIN within the *E. immersa* group with a distance of 7.5%.

Host plants. Possibly *Rubus caesius* L. (*ex larva* rearing by JM), but likely other Rosaceae in addition because *R. caesius* seemed to be absent in places where the Bulgarian specimens were collected. From the larva illustrated in Figures 17 and 18 an adult female was reared, but the specimen was destroyed during an attempt to dissect the ovipositor (Czech Republic, Bohemia or., NR Báň u Hradčan, 31.5.2005, on *Rubus caesius*, adult emerged 31.3.2006, J. Macek coll. et det.). The adult did, however, closely resemble paratype specimens of *E. aridicola* from the same site.

Distribution. West Palaearctic. Confirmed country records are from Bulgaria, Czech Republic, France, Germany, Greece, Hungary, Russia (Ulyanovsk Oblast), and Slovakia.

Notes. This species could most easily be confused with *E. parvula* and *E. sexpunctata* by its external morphology (2 or 3 pairs of pale patches on posterior margins abdominal terga, tarsal claw with distinct subbasal tooth). The most reliable way to distinguish *E. parvula* from *E. aridicola* is to examine saws and penis valves (Figs 6, 13, 19, 20, 24, 25, 29). Serrulae are distinctly more flat in *E. parvula* (Figs 19, 20) compared to *E. aridicola* (Fig. 6). In *E. aridicola* males, the dorsal margin of the valviceps bends basally and apically in a rather similar way, so that the dorsal margin nearly forms a semicircle (Figs 13, 29). In *E. parvula*, the dorsal margin of the valviceps is quite asymmetric, bending basally much more abruptly than apically (Figs 24, 25). In *E. parvula*, the paired patches on abdominal terga are often detached from posterior margins of the terga, which can also be helpful in distinguishing the species. The best character to separate females of *E. sexpunctata* and *E. aridicola* is the position of paired patches on abdominal terga, which are detached from the posterior margin in *E. sexpunctata* (cf. Figs 1, 30). Head shape can also be helpful to distinguish females and males of *E. sexpunctata* and *E. aridicola*: the postocellar area is usually more than 2.5 times as broad as long in *E. sexpunctata* (Fig. 31), while in *E. aridicola* this ratio is less than 2.4 (Fig. 3), although there might be overlap. Although saws of *E. sexpunctata* and *E. aridicola* (Figs 6, 23) are hardly distinguishable, penis valves of these species are quite easy to separate (Figs 13, 28, 29). Many of the males of *E. sexpunctata* can be distinguished from *E. aridicola* also by the larger number (3–5) of pale patches on abdominal terga. Prous (2012) used the name *E. kuznetzovi* Dovnar-Zapolskij, 1929 for *E. aridicola* based on the original description (Dovnar-Zapolskij 1929), which is, however, consistent also with *E. parvula*. Because no type specimens of *E. kuznetzovi* Dovnar-Zapolskij, 1929 have been found in ZIN, we maintain the synonymy with *E. parvula* (Konow, 1892) as proposed by Conde (1940), who apparently did study the type specimen(s).

Empria liturata (Gmelin, 1790)*

Material. Varna: 1♂ (DEI-GISHym84164), Tsonevo 5 km S, 100 m, 42.982N, 27.451E, 06.04.2018. 2♂, Staro Oryahovo 2 km SW, 120 m, 42.976N, 27.787E, 09.04.2018. 1♂, locality as previous, 11.04.2018. 1♂, Dolni Chiflik 2 km SE, 50 m, 42.983N, 27.743E, 13.04.2018.

Confirmed records are from central Europe and Japan (Prous et al. 2011a).

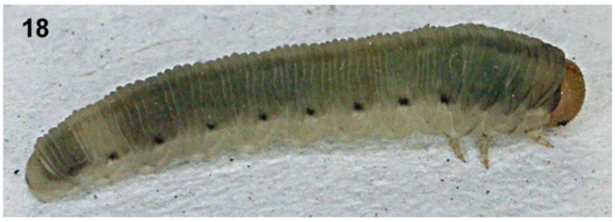
Empria parvula (Konow, 1892)*

Poecilosoma parvula Konow, 1892 : 215. Lectotype ♂ GBIF-GISHym3784 (SDEI), here designated. Type locality: Fürstenberg in Mecklenburg, Germany, Brandenburg.

Empria pseudoklugi [*pseudo-klugi* sic!] Dovnar-Zapolskij, 1929: 39. Lectotype ♀ ZIN_Empria_8 (ZIN), here designated. Type locality: Sarepta, Volgograd Oblast, Russia.

Bulgarian material. Varna: 1♂ (DEI-GISHym88775), Tsonevo 5 km S, 100 m, 42.982N, 27.451E, 06.04.2018. 1♀, locality as previous, 08.04.2018. 1♀ (DEI-GISHym88802), Staro Oryahovo 2 km SW, 120 m, 42.976N, 27.787E, 08.04.2018. 1♂, locality as previous, 09.04.2018. 1♀, 1♂, Goren Chiflik 1 km SW, 40 m, 43.001N, 27.621E, 13.04.2018.

Empria parvula has an extensive distribution in Europe (Taeger et al. 2006) and the Palaearctic (Sundukov 2017; Taeger et al. 2018). According to morphological characters and genetic data, the species is very closely related to *E. pravei*. The only clear difference between them is the colouration of the legs in the adults. Legs in *E. parvula* are usually mostly black with small pale areas, but occasionally the hind tibia can be basally 2/3 whitish or yellowish. Nevertheless, the metafemur appears to be always completely or nearly completely black in *E. parvula* (Fig. 32). In *E. pravei*, femora are apically and tibiae basally extensively yellowish (Fig. 33). There could be differences also in penis valves, but because of the variation within *E. parvula*, the differences are not always clear (Figs 24–27). The valviceps seems to usually expand basally less in *E. parvula* than in *E. pravei* (Figs 24–27). Host plants and at least colouration of larvae are not different between *E. parvula* and *E. pravei* (Figs 34, 35). Based on the sequence data of three genes that we currently have, *E. parvula* does not form a monophyletic group, particularly because an *E. parvula* specimen sampled from Bulgaria is closer to *E. pravei* than to other *E. parvula* specimens (from Estonia, Greece, and Russian Far East) (Figs 16, 36). Ignoring morphological evidence, our genetic data could be interpreted as indicating either that *E. pravei* is a synonym of *E. parvula*, or that *E. parvula* consists of more than one species. Because in Bulgaria we found *E. pravei* and *E. parvula* in the same places at the same time and never observed overlap with regard to leg colouration, we consider *E. pravei* to be a distinct species. Although the existence of more than one species under the name *E. parvula* cannot be excluded, the data is also consistent with a single species exhibiting large genetic variation, perhaps connected with the significantly larger population size in *E. parvula* (distributed throughout the Palaearctic) compared to *E. pravei* (possibly restricted to areas not far from the Black Sea and

Figures 17, 18. *Empria aridicola* larva.

south of the Caspian Sea). In other words, non-monophyly of *E. parvula* could be because of incomplete lineage sorting (maintaining of ancestral polymorphisms) due to large population size (e.g. Degnan and Rosenberg 2009). More specimens and genes of both species should be sequenced or mating experiments done to decide more reliably about species boundaries in this case.

Empria pravei Dovnar-Zapolskij, 1925*

Empria pravei Dovnar-Zapolskij, 1925: 37–38. Lectotype ♀ ZIN_Empria_11 (ZIN), here designated. Type locality: Stavropol, Stavropol Krai, Russia.

Bulgarian material. Burgas: 1♂ (DEI-GISHym88758), Primorsko 4 km NW, 20 m, 42.300N, 27.729E, 04.04.2018. 1♀, locality as previous, 10.04.2018.

Varna: 3♀ (including DEI-GISHym84166), 3♂ (including DEI-GISHym88817, DEI-GISHym88735), Staro Oryahovo 2 km SW, 120 m, 42.976N, 27.787E, 09.04.2018. 1♀, locality as previous, 11.04.2018. 2♂, Goren Chiflik 1 km SW, 40 m, 43.001N, 27.621E, 13.04.2018.

The specimens were collected in woodland, from the herb layer, at places where a *Geum* species (probably *Geum urbanum* L.) was rather abundant. Of other herbaceous Rosaceae, *Fragaria ?viridis* Weston, and *Rubus fruticosa* L. agg. were commonly present. Female DEI-GISHym84166 was sleeved on a potted *Geum* plant, taken from the collection locality, on which it then laid eggs in the leaf-blade (Fig. 37). Several larvae (Fig. 35; https://sdei.de/ecatsym/ecat_bild.php?NameNr=1003703&DateiName=25774.JPG) were reared to maturity on this plant.

Empria pravei was described from two female syntypes (one in ZIN, examined by MP) from Stavropol (Dovnar-Zapolskij 1925). This locality, in the North Caucasus, lies outside the area treated by Taeger et al. (2006) as "Europe". Other published records are from Armenia and Iran (Sundukov 2017). The species is very close to *E. parvula* (see discussion under that species). The record from Mongolia (Zombori 1972) is incorrect due to misidentification of *E. mongolica* (Konow, 1895). *Empria pravei* might be restricted to areas not far from the Black Sea and south of the Caspian Sea.

Empria pumiloides Lindqvist, 1968*

Material. Burgas: 1♂, Burgas 8 km SE, 40 m, 42.432N, 27.527E, 10.04.2018. 1♂, Indzhe Voivoda 3 km NE, 250 m, 42.235N, 27.451E, 12.04.2018. The first specimen was swept from *Filipendula vulgaris* Moench.

Previously only recorded in northern and central Europe (Taeger et al. 2006). *Filipendula ulmaria* (L.) Maxim. was the only known host plant (Heidemaa and Prous 2006), but this was absent at both of the above Bulgarian localities, whereas *F. vulgaris* was rather abundant. Therefore, it seems likely that *F. vulgaris* is also a host.

Empria tridens (Konow, 1896)*

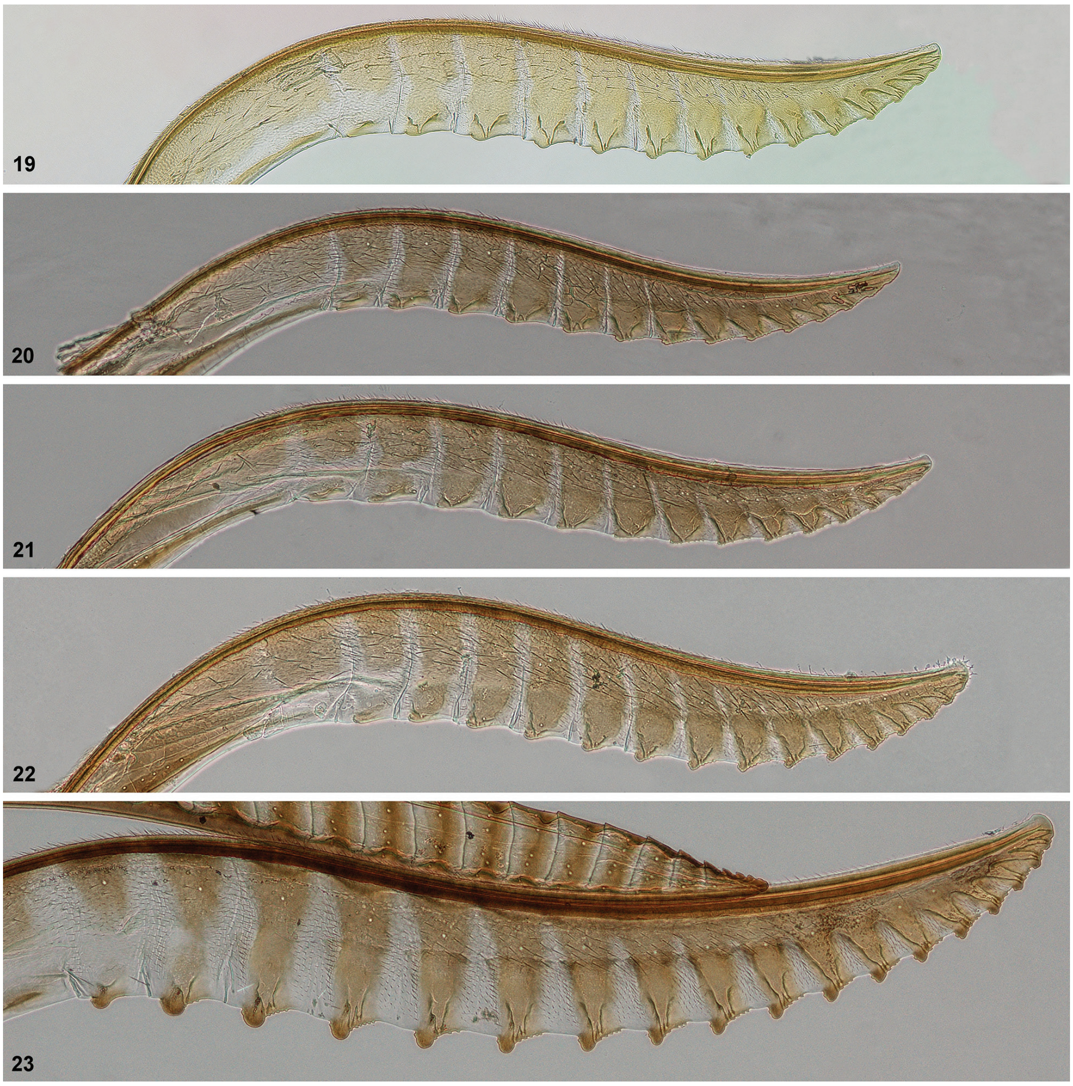
Material. Varna: 1♂ (DEI-GISHym88776), Tsonevo 5 km S, 100 m, 42.982N, 27.451E, 06.04.2018. 3♂ (including DEI-GISHym88816, DEI-GISHym88736), Staro Oryahovo 2 km SW, 120 m, 42.976N, 27.787E, 09.04.2018. 1♂, locality as previous, 11.04.2018. 2♂ (DEI-GISHym31967, DEI-GISHym88857), Dolni Chiflik 2 km SE, 50 m, 42.983N, 27.743E, 13.04.2018.

The above specimens are unusually coloured. Abdominal terga (1–) 2–5 (–6) are more or less pale, including the normally black areas surrounding the pale unsclerotised patches (Fig. 38). The corresponding sterna are also more or less pale (Fig. 39). In life, the pale areas are whitish, and more conspicuous than in the pinned specimens, where the colour has become rather brown. No females were collected, so we cannot state whether this sex also exhibits unusual coloration in south-eastern Bulgaria. *Empria tridens* has a wide Palaearctic distribution (Prous et al. 2011b). Penis valves are not distinguishable from other *E. tridens* and genetic data (based on one male DEI-GISHym88776, Fig. 16) does not indicate the existence of an additional species either (based on three genes, closest specimens are always other specimens of *E. tridens* that were studied by Prous et al. 2019).

Endelomyia filipendulae Lacourt, 1998*

Material. Burgas: 1♂ (DEI-GISHym31826), Burgas 8 km SE, 40 m, 42.432N, 27.527E, 10.04.2018. Swept from low vegetation containing much *Filipendula vulgaris*.

The females of *Endelomyia filipendulae* are morphologically not easily separable from those of *E. aethiops* (Gmelin, 1790) using the ovipositor characters illustrated



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Figures 19–23. Saws of *Empria*. **19** *Empria parvula* DEI-GISHym18703 (Greece) **20** *E. parvula*, *E. pseudoklugi* lectotype ZIN_Empria_8 (Russia) **21** *E. pravei*, lectotype ZIN_Empria_11 (Russia) **22** *E. pravei* BMNH1967-364 (Iran) **23** *E. sexpunctata* DEI-GISHym15130 (Greece).

by Lacourt (1998). However, these species have clearly different COI barcodes (Schmidt et al. 2017) and different host plants: respectively, *Filipendula vulgaris* and *Rosa* species (Liston et al. 2006). Males of *E. filipendulae* were previously unknown and those of *E. aethiops* are rare. As far as we are aware, the penis valve of *E. aethiops* has not been figured. The penis valve of the Bulgarian *E. filipendulae* specimen is illustrated in Figure 40.

Endelomyia filipendulae was previously only known from France, Germany, and Italy (Schmidt et al. 2017).

Euura pedunculi (Hartig, 1837)*

Material. Sliven: 5♀, 1♂, Ichera 3 km SW, 730 m, 42.749N, 26.421E, 14.04.2018.

Swept from *Salix caprea* L.

Widely distributed in Europe and east to Sakhalin (Liston et al. 2017).

Euura venusta (Brischke, 1883)*

Material. Sliven: 1♀, Ichera, 490 m, 42.763N, 26.450E, 14.04.2018. 1♂, Ichera 3 km SW, 730 m, 42.749N, 26.421E, 14.04.2018.

Swept from *Salix caprea*.

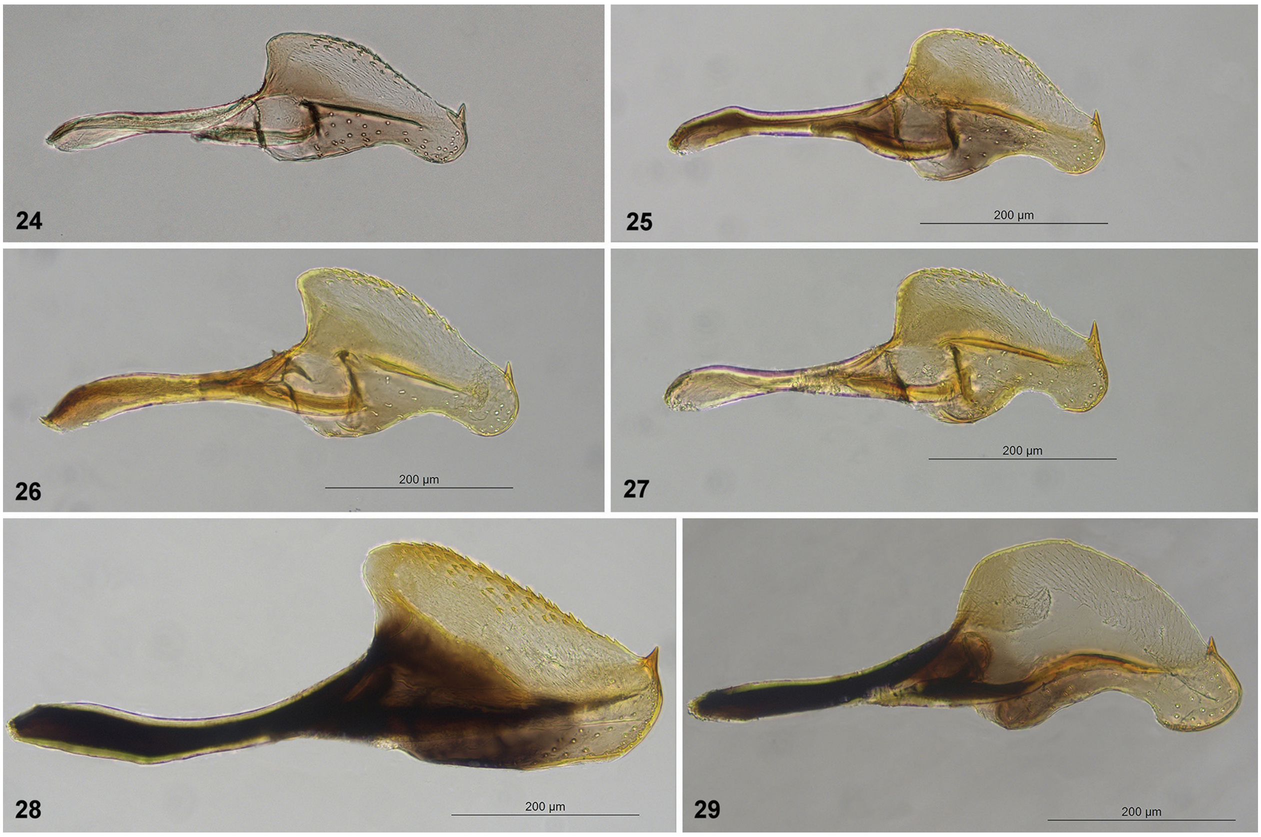
Previously recorded in central and northern Europe and east to the Russian Far East (Liston et al. 2017).

Euura vittata (Serville, 1823)*

Material. Sliven: 1♀, 3♂, Ichera 3 km SW, 730 m, 42.749N, 26.421E, 14.04.2018.

Swept from *Salix caprea*.

Euura vittata has a wide distribution in the Palaearctic (Lacourt 1999).



Figures 24–29. Penis valves of *Empria*. **24** *Empria parvula* TUZ615399 (Estonia) **25** *E. parvula* DEI-GISHym88775 (Bulgaria) **26** *E. pravei* DEI-GISHym88735 (Bulgaria) **27** *E. pravei* DEI-GISHym88758 (Bulgaria) **28** *E. sexpunctata* DEI-GISHym88818 (Bulgaria) **29** *E. aridicola* paratype DEI-GISHym80304 (Greece).

Euura humeralis (Serville, 1823)*

Material. Sliven: 1♂, Ichera 3 km SW, 730 m, 42.749N, 26.421E, 14.04.2018.

Swept from *Salix caprea*.

Previously recorded from northern and central Europe, south-east to Romania (Taeger et al. 2006), and also from the Eastern Palaearctic (Sundukov 2017).

Heterarthrus wuestneii (Konow, 1905)*

Material. Sliven: 1♀, Sliven 4 km NE, 440 m, 42.711N, 26.394E, 14.04.2018.

Heterarthrus wuestneii is widespread in the Western Palaearctic (Liston et al. 2015), but not known north of Denmark (Taeger et al. 2006).

Hinatara nigripes (Konow, 1907)

Material. We collected a total of 27♀ and 12♂ at various localities in Burgas, Sliven, and Varna provinces, mostly swept from *Acer campestre* L., the only known host plant.

Hinatara nigripes is only known from central and southern Europe (Taeger et al. 2006). The apparent abundance of the species in Bulgaria contrasts strongly with its rare and sporadic occurrence on the northern edge of its range, such as in Germany (Liston et al. 2012).

Hoplocampa cantoti Chevin, 1986*

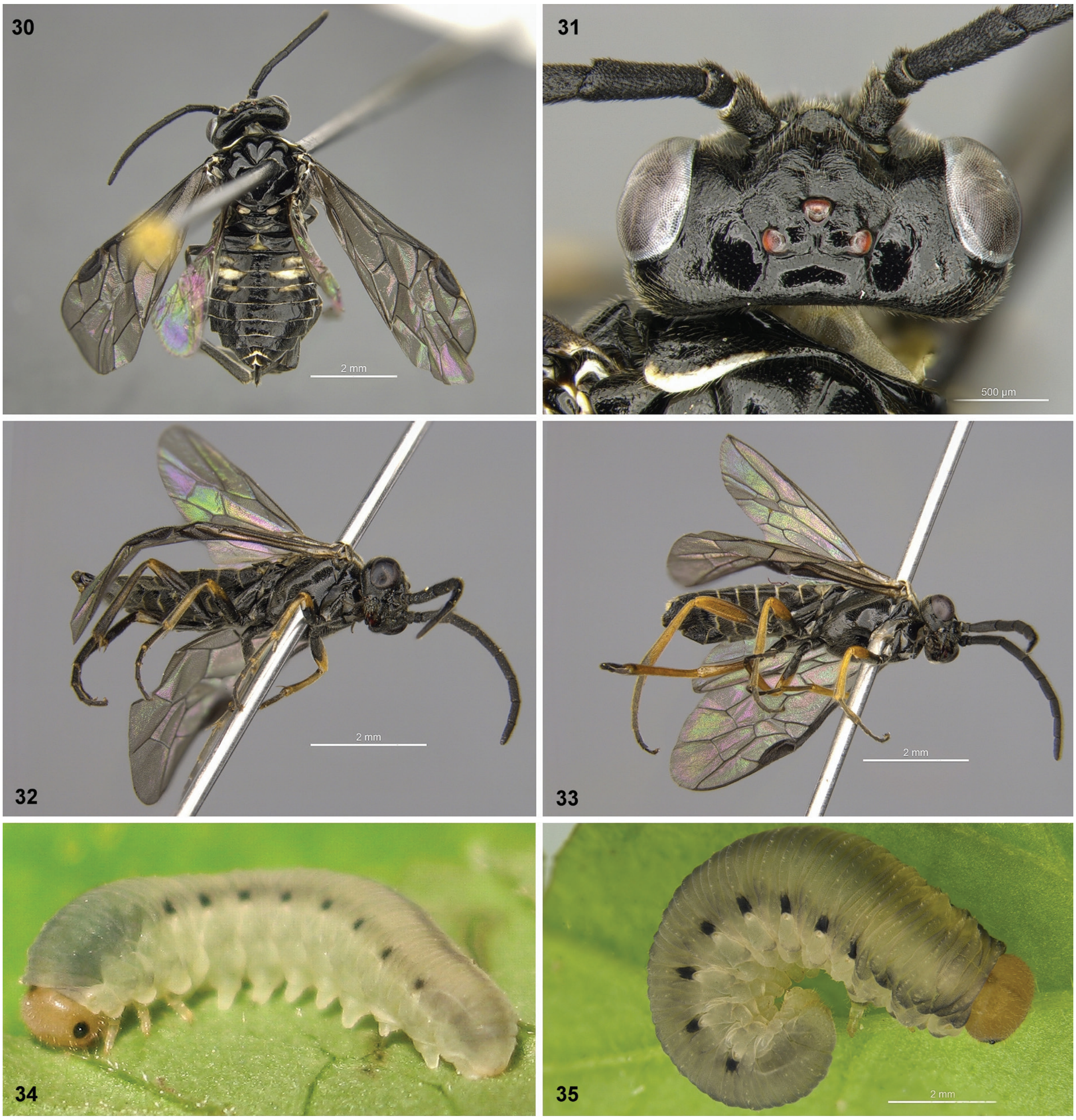
Material. Varna: 1♀, Tsonevo 5 km S, 100 m, 42.982N, 27.451E, 02.04.2018. 1♀ (DEI-GISHym88748), locality as previous, 03.04.2018. 1♀, locality as previous, 06.04.2018. 5♀, Dolni Chiflik 2 km SE, 50 m, 42.983N, 27.743E, 05.04.2018. 1♀, locality as previous, 13.04.2018. Mostly swept from *Prunus spinosa* L., and once or twice from *P. domestica* L. growing among these.

Chevin (1986) suggested that the host of *H. cantoti* is *Prunus mahaleb* L., which is a characteristic component of the woody vegetation of the two known French localities. However, *Prunus mahaleb* was not seen at the Bulgarian localities. Therefore, we suppose that the host is *Prunus spinosa*, from which we collected most of the specimens.

Until now, this species was only known from the three female type specimens collected in northern France (Chevin 1986).

Hoplocampa flava (Linnaeus, 1760)

Material. Pazardzhik: 1♀, Vinogradets 3 km N, 300 m, 42.319N, 24.128E, 31.03.2018.



Figures 30–35. *Empria* species. **30** *Empria sexpunctata* DEI-GISHym88916, body dorsal; **31** head dorsal. **32** *E. parvula* DEI-GISHym88913, ventrolateral **33** *E. pravei* DEI-GISHym88735, ventrolateral. **34** *E. parvula* larva TUZ615249 (Estonia) **35** *E. pravei* larva, reared *ex ovo* from DEI-GISHym84166 (Bulgaria).

Not mentioned as occurring in Bulgaria by Vassilev (1978) or Taeger et al. (2006), although the species is a significant pest of cultivated plums in some parts of the country (Andreev and Kutinkova 2010).

Hoplocampa fulvicornis (Panzer, 1801)*

Material. Burgas: 1♀, Banya 3 km E, 40 m, 42.767N, 27.853E, 01.04.2018. 2♀, Slanchev Bryag 1 km N, 70 m, 42.718N, 27.725E, 01.04.2018. 2♀, 2♂, Sozopol 6 km S, 10 m, 42.361N, 27.700E, 04.04.2018. 1♀, Veselie 3 km NW, 50 m, 42.346N, 27.590E, 04.04.2018.

Pazardzhik: 3♀, 6♂, Vinogradets 3 km N, 300 m, 42.319N, 24.128E, 31.03.2018.

Varna: 4♀, 2♂, Rudnik 1 km SE, 100 m, 42.944N, 27.781E, 02.04.2018. 1♂, Tsonevo 1 km SW, 100 m, 43.016N, 27.428E, 02.04.2018. 2♀, 1♂, Tsonevo 5 km S, 100 m, 42.982N, 27.451E, 02.04.2018. 1♀, locality as previous, 03.04.2018. 2♀, locality as previous, 06.04.2018. 10♀, 3♂, Dolni Chiflik 2 km SE, 50 m, 42.983N, 27.743E, 05.04.2018. 4♀, locality as previous, 13.04.2018. 1♀, Golitsa 1 km E, 240 m, 42.918N, 27.562E, 05.04.2018. 1♀, 3♂, Staro Oryahovo 2 km SW, 120 m, 42.976N, 27.787E, 08.04.2018. 3♀, 2♂, locality as previous, 13.04.2018.

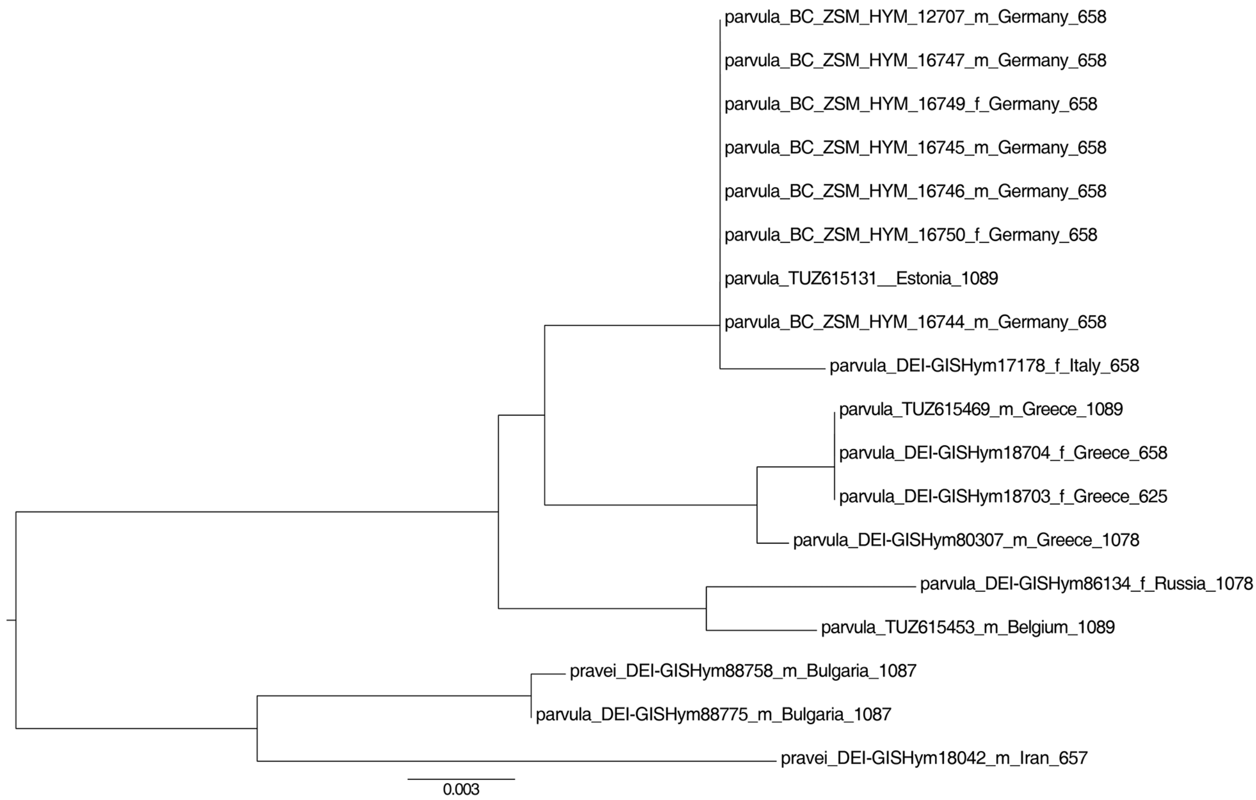


Figure 36. Maximum likelihood tree of *Empria parvula* and *E. pravei* specimens based on mitochondrial COI. Best-fit model chosen according to Bayesian information criterion was HKY+I. Numbers above branches show SH-aLRT support (%) / ultrafast bootstrap support (%) values. Support values for weakly supported branches (<90) are not shown. Letters "f" and "m" stand for "female" and "male". Numbers at the end of the tip labels refer to the length of the sequence. The scale bar shows the number of estimated substitutions per nucleotide position.

Hoplocampa fulvicornis occurs in Europe and Turkey (Lacourt 1999).

Macrophya recognata Zombori, 1979*

Material. Kyustendil: 1♂, Rila-Gebirge, Rila-Kloster [= Rilski Manastir], 42.133N, 23.350E, 20.06.1990, leg. A. Taeger & F. Menzel, det. A. Taeger (by exchange now in private collection of Matti Viitasaari, Helsinki).

Recorded from central and eastern Europe, and the Caucasus (Lacourt 1999).

Nematus lucidus (Panzer, 1801)*

Material. Burgas: 2♂, Mrezhichko 1 km W, 370 m, 42.860N, 27.397E, 07.04.2018. 1♂ (DEI-GISHym88830), Primorsko 4 km NW, 20 m, 42.300N, 27.729E, 10.04.2018. 1♀, Indzhe Voivoda 3 km NE, 250 m, 42.235N, 27.451E, 12.04.2018.

Varna: 1♂, Tsonevo 1 km SW, 100 m, 43.016N, 27.428E, 02.04.2018. 1♂ (DEI-GISHym88773), Tsonevo 5 km S, 100 m, 42.982N, 27.451E, 06.04.2018. 2♂, Goren Chiflik 1 km SW, 40 m, 43.001N, 27.621E, 13.04.2018. 1♀, Dolni Chiflik 2 km SE, 50 m, 42.983N, 27.743E, 13.04.2018.

Nematus lucidus is widespread in the Western and Eastern Palaearctic (Sundukov 2017).

Nematus umbratus (Thomson, 1871)*

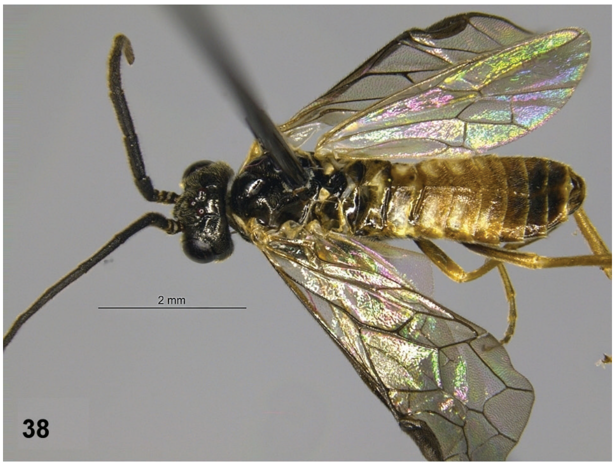
Material. Varna: 1♀, Staro Oryahovo 2 km SW, 120 m, 42.976N, 27.787E, 09.04.2018.

Central and northern Europe (Taeger et al. 2006), to East Siberia (Sundukov 2017).

Neomessa steusloffi (Konow, 1892)*

Material. Varna: 1♂ (DEI-GISHym88743), Tsonevo 5 km S, 100 m, 42.982N, 27.451E, 02.04.2018. 1♀ (DEI-GISHym88749), locality as previous, 03.04.2018. 6♀ (including DEI-GISHym31831), 4♂ (including DEI-GISHym31830 and 31832), Dolni Chiflik 2 km SE, 50 m, 42.983N, 27.743E, 05.04.2018. 1♀, locality as previous, 13.04.2018. 1♂, Staro Oryahovo 2 km SW, 120 m,

Figure 37. *Empria pravei* DEI-GISHym84166 ovipositing on *Geum ?urbanum*.



Figures 38, 39. Unusually coloured *Empria tridens* DEI-GISHym31967 male from Bulgaria. **38** dorsal **39** ventrolateral.

42.976N, 27.787E, 09.04.2018. 1♀, locality as previous, 11.04.2018.

Other material examined. Germany, Mecklenburg-Vorpommern: 1♂ [lectotype; in very poor condition], Neubrandenburg i. M. (SDEI). 1♀, near Teschendorf [according to Konow 1897: "in hiesiger Gegend"] (SDEI).

Taxonomic history.

? *Fenusa* sp. nov. Konow 1885: 298–299. Description of male.

Fenusa steusloffi Konow, 1892: 213. Name proposed by indication on Konow (1885). Syntypes. Type locality: Neubrandenburg i. M. [Germany, Mecklenburg-Vorpommern, Neubrandenburg]. Konow 1897: 180–181, description of female.

Fenusa steusloffii. Dalla Torre 1894: 157. Name for *Fenusa steusloffi* Konow, 1892. Primary homonym of *Fenusa steusloffi* Konow, 1892.

Fenusella steusloffi. Enslin 1914: 306. New combination.

Metallus steusloffi. Benson 1959: 90. New combination, invalid lectotype designation [of the female specimen in SDEI collection].

Neomessa steusloffi. Koch 1990: 72–73. New combination, redescription, lectotype designation.

This species (and thus the monotypic genus to which it belongs) does not run unambiguously to a genus in the key to fenusine genera of the world by Smith (1976a), because it has the following combination of characters: winged; tarsal claw with one outer tooth and an acute basal lobe; prepectus absent; genal carina absent; stub of vein 2A+3A of fore wing curved up. With the genal carina scored as absent (this character is difficult to see), *N. steusloffi* does not run past couplet 17, because the radial cell of the hind wing is open at the apex, but the stub of vein 2A+3A of the fore wing is curved. If the genal carina is scored as present, then in the final key couplet leading to *Scolioneura*, the character given by Smith "antennal segments 3 and 4 about equal in length" does not fit *N. steusloffi*, which has antennomere 4 about 0.6× as long as antennomere 3.

Both Konow (1885) and Koch (1990) have already described a distinctive character in the venation of *Neomessa*: fore wing vein Rs+M is largely obsolete except for a small stub on Rs, and Rs is strongly bent at this point (Fig. 41). All examined specimens show this. Within the Fenusini, this character is apparently unique to *Neomessa*. Furthermore, fore wing vein M is very straight, whereas it is basally curved in most other genera. The male (Fig. 43) is additionally easily distinguishable from other Western Palaearctic fenusines by the colour of the abdomen, which is black with the following yellow: apical terga from T5 or T6 (Fig. 45), sterna S8 and S9 and narrow distal margin of S7 (Fig. 44), and visible parts of genitalia. Only the male of *Parna tenella* (Klug, 1816) also has an extensively yellow abdomen; but it differs in only abdominal terga 1 and 2 being mainly black, and in its largely pale legs (legs nearly entirely black in *N. steusloffi*: Figs 42, 43). We illustrate the penis valve of one of the Bulgarian specimens (Fig. 46), because the drawing by Koch (1990) lacks detail.

Based on the combined analyses of mitochondrial COI and nuclear NaK genes (one sequenced male DEI-GISHym88743), the species forms a strongly supported clade with *Scolioneura* and *Fenusella*, but the relationships between the three genera are less well resolved (Fig. 47).

Figure 40. *Endelomyia filipendulae* DEI-GISHym31826 penis valve.

Biology. Host plant unknown. All the Bulgarian specimens were swept from the newly opened buds or fresh leaves of one or more unidentified *Quercus* species, with the exception of the first male, which was swept from low vegetation just outside an area of mixed woodland. According to Konow (1885), the small series of syntype males was collected from flowers of *Prunus spinosa*. Subsequent authors (e.g. Benson 1959) have therefore suspected *P. spinosa* to be the host plant. According to our observations, *Quercus* seems to be a more likely host.

Distribution. Previously only definitely known from Mecklenburg-Vorpommern, in north-eastern Germany, and now from south-eastern Bulgaria. Muche (1973) published a record of a female identified as this species from Großschönau (Germany, Saxony). However, because he mentioned that this specimen possessed four cubital cells in the fore wing (unlike any specimens which we have seen), it seems likely that it was misidentified.

Parna apicalis (Brischke, 1888)*

Material. Varna: 1♀, Goren Chiflik, 30 m, 43.014N, 27.626E, 13.04.2018.

The recorded distribution of this species stretches from southern Fennoscandia and the British Isles, through Central Europe (Taeger et al. 2006), reaching south-east as far as Croatia (Matoševic et al. 2009) and Hungary (Edmunds 2016). Muche (1977) briefly described a "*Parna* aff. *tenella* (Klug)" from a single female specimen collected on Mount Vitoscha. Although his description might be thought to refer to *P. apicalis*, the specimen, in the Museum für Naturkunde, Berlin, was examined by AL and found to be *Hinatara nigripes*.

Pristiphora abbreviata (Hartig, 1837)*

Material. Burgas: 1♀ (DEI-GISHym88845), Indzhe Voivoda 3 km NE, 250 m, 42.235N, 27.451E, 12.04.2018.

Pristiphora abbreviata is widely distributed in the Palaearctic and has also been introduced to North America (Sundukov 2017).

Pristiphora armata (Thomson, 1863)*

Material. Burgas: 2♂ (including DEI-GISHym88846), Indzhe Voivoda 3 km NE, 250 m, 42.235N, 27.451E, 12.04.2018.

Varna: 1♂ (DEI-GISHym88848), Goren Chiflik 1 km SW, 40 m, 43.001N, 27.621E, 13.04.2018. 1♀, Dolni Chiflik 2 km SE, 50 m, 42.983N, 27.743E, 13.04.2018.

Widespread in the West Palaearctic (Prous et al. 2017); records from the Russian Far East (Sundukov 2017) require confirmation because the characterisation of this species in earlier literature was inadequate for identification.

Pristiphora biscalis (Förster, 1854)*

Material. Burgas: 2♂, Primorsko 4 km NW, 20 m, 42.300N, 27.729E, 10.04.2018.

Sliven: 1♀, Sliven 6 km NE, 470 m, 42.726N, 26.402E, 14.04.2018.

Varna: 1♂ (DEI-GISHym88850), Dolni Chiflik 2 km SE, 50 m, 42.983N, 27.743E, 13.04.2018.

Widespread in the Western Palaearctic, north to southern Sweden (Prous et al. 2017). According to Sundukov (2017) also in the Eastern Palaearctic, but at least some of the earlier records of *P. biscalis* in the Russian literature are based on misidentifications (Zinovjev 1993).

Pristiphora depressa (Hartig, 1840)*

Material. Varna: 2♀, Staro Oryahovo 2 km SW, 120 m, 42.976N, 27.787E, 09.04.2018. 1♀, Dolni Chiflik 2 km SE, 50 m, 42.983N, 27.743E, 13.04.2018.

All specimens were swept from *Acer campestre*, which is almost certainly the larval host, because no other *Acer* species was present at these localities. *Pristiphora depressa* is under-recorded, because it was until recently mixed up with *P. subbifida* (Thomson, 1871), but apparently has a wide distribution in Europe from Sweden to southern Italy (Prous et al. 2017).

Pristiphora fausta (Hartig, 1837)*

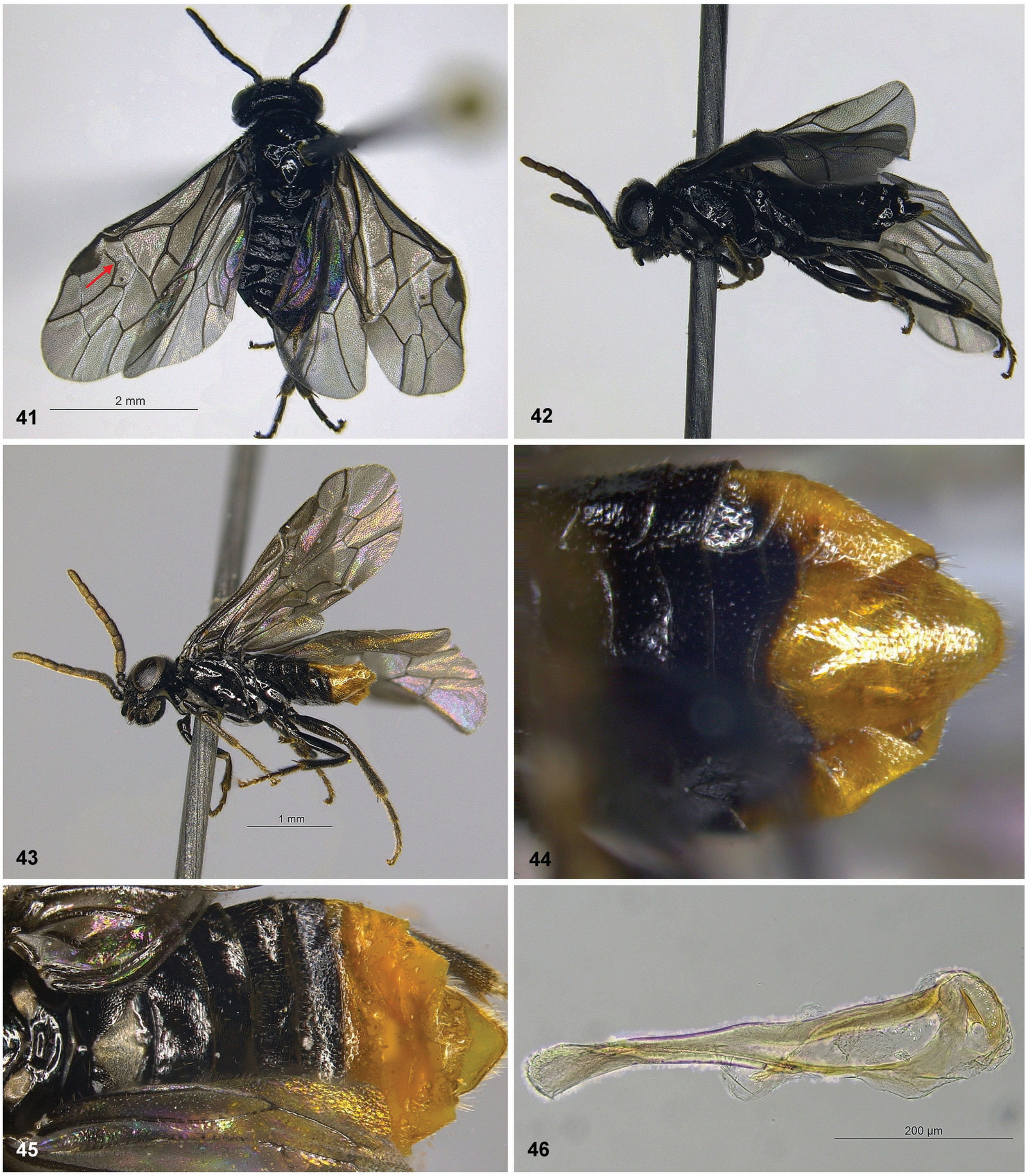
Material. Varna: 2♂, Staro Oryahovo 2 km SW, 120 m, 42.976N, 27.787E, 08.04.2018. 1♀, locality as previous, 11.04.2018.

Recorded from Central and Southern Europe (Prous et al. 2017), as well as Moldavia (Ermolenko and Plugaru 1973).

Pristiphora maesta (Zaddach, 1876)*

Material. Burgas: 1♂ (DEI-GISHym88844), Indzhe Voivoda 3 km NE, 250 m, 42.235N, 27.451E, 12.04.2018.

Occurs in Europe, Caucasus, East Siberia, and the Russian Far East (Sundukov 2017).



Figures 41–46. *Neomessa steusloffi*. **41, 42** Female habitus, bend on vein Rs arrowed, DEI-GISHym31831. **43** Male DEI-GISHym31832 habitus. **44** Male DEI-GISHym31832 abdomen ventral. **45** Male DEI-GISHym31830 abdomen dorsal. **46** DEI-GISHym88743 Penis valve.

Pristiphora monogyniae* (Hartig, 1840)

Material. Burgas: 2♂, Primorsko 4 km NW, 20 m, 42.300N, 27.729E, 04.04.2018. 1♀, 1♂, locality as previous, 10.04.2018. 1♀, Indzhe Voivoda 3 km NE, 250 m, 42.235N, 27.451E, 12.04.2018.

Sliven: 1♀, Sliven 6 km NE, 470 m, 42.726N, 26.402E, 14.04.2018.

Varna: 1♂, Tsonevo 5 km S, 100 m, 42.982N, 27.451E, 06.04.2018. 1♂, locality as previous, 08.04.2018. 1♂, Staro Oryahovo 2 km SW, 120 m, 42.976N, 27.787E, 08.04.2018. 2♂, locality as previous, 09.04.2018. 1♀, 2♂, locality as previous, 11.04.2018. 3♀, 5♂, Dolni Chiflik 2 km SE, 50 m, 42.983N, 27.743E, 13.04.2018.

Widespread in Europe, north to Sweden (Prous et al. 2017), also in the Caucasus (Sundukov 2017).

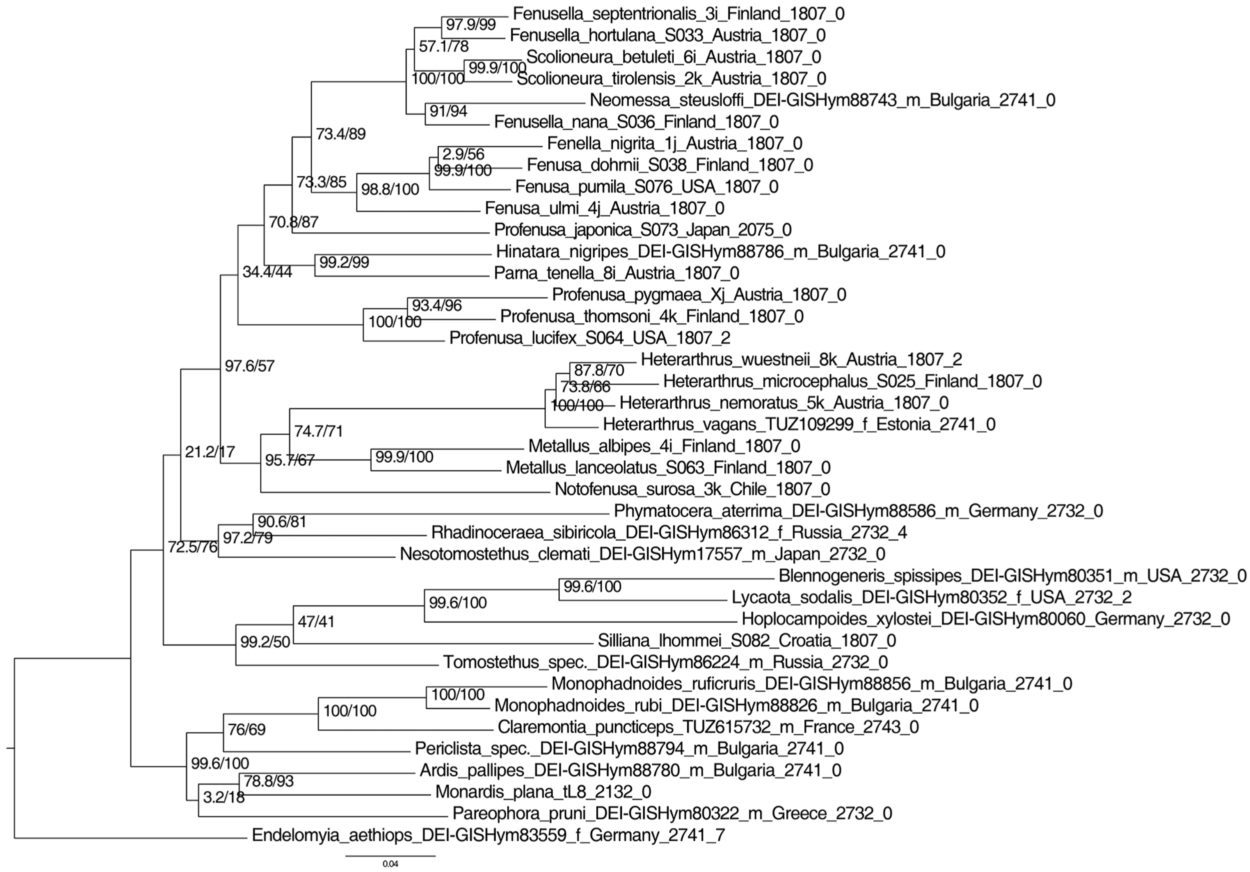


Figure 47. Maximum likelihood tree of Blennocampinae and Heterarthrinae based on two genes (COI and NaK). Best-fit model chosen according to Bayesian information criterion was GTR+I+G4. Numbers beside nodes show SH-aLRT support (%) / ultrafast bootstrap support (%) values. Support values for weakly supported branches (<90) are not shown. Letters "f" and "m" stand for "female" and "male". Numbers at the end of the tip labels refer to the length of the sequence and the number of ambiguous positions (e.g. polymorphisms). The tree was rooted according to the results of Leppänen et al. (2012). The scale bar shows the number of estimated substitutions per nucleotide position.

Pseudodineura fuscula (Klug, 1816)*

Material. Burgas: 1♀, Primorsko 4 km NW, 20 m, 42.300N, 27.729E, 03.04.2018. 1♀, Mrezhichko 1 km W, 370 m, 42.860N, 27.397E, 07.04.2018.

Varna: 1♀, Tsonevo 5 km S, 100 m, 42.982N, 27.451E, 02.04.2018. 1♀, locality as previous, 03.04.2018.

Southern, central and northern Europe, including British Isles (Taeger et al. 2006), Armenia, Kazakhstan, and eastern Siberia (Sundukov 2017), and introduced to North America (Smith 1976b).

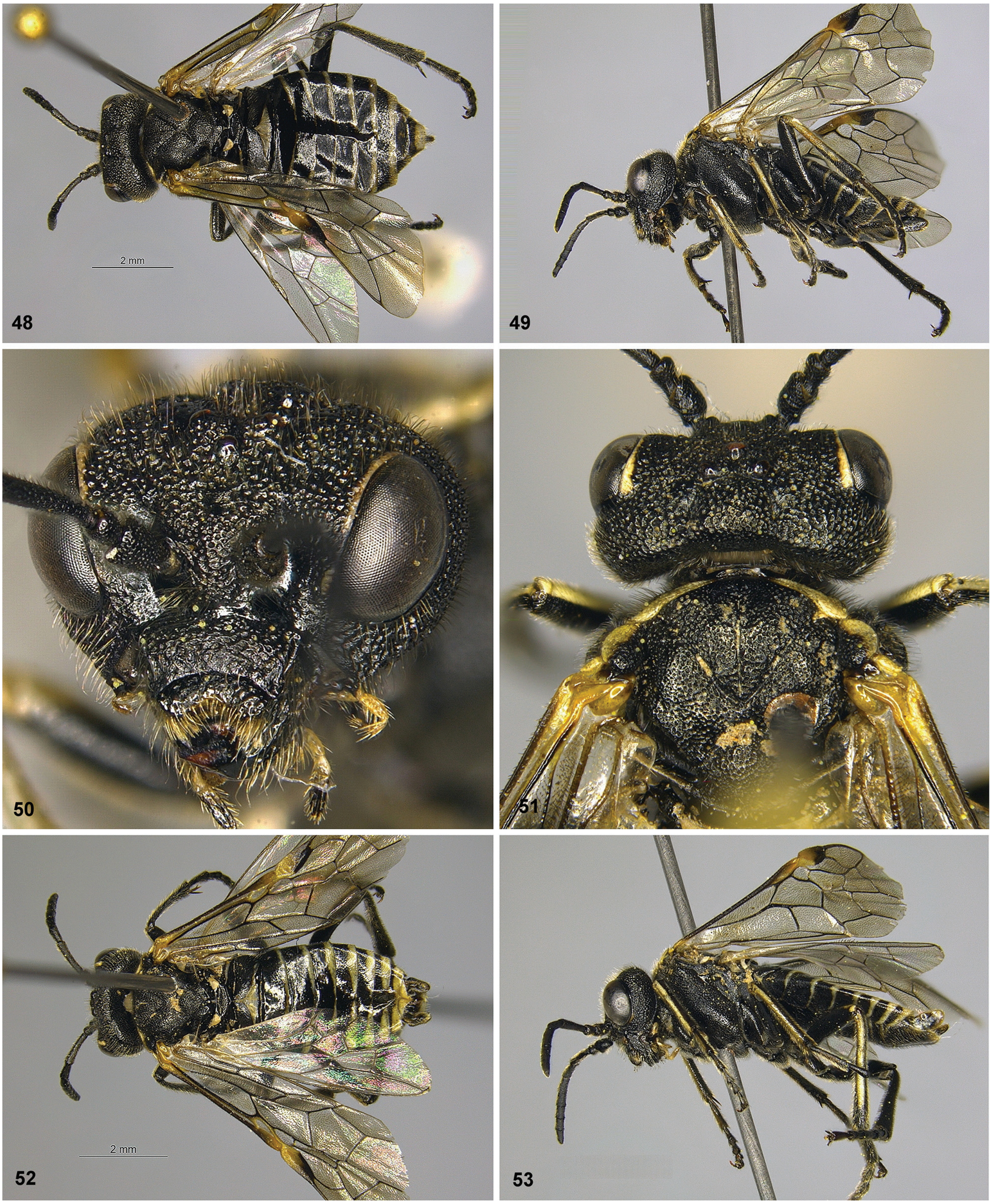
Sciapteryx byzantina Benson, 1968*

Material. Burgas: 2♀, 1♂ (DEI-GISHym88755), Primorsko 4 km NW, 20 m, 42.300N, 27.729E, 04.04.2018. 1♂ (DEI-GISHym31834), locality as previous, 10.04.2018.

Varna: 2♂ (including DEI-GISHym88746), Tsonevo 5 km S, 100 m, 42.982N, 27.451E, 02.04.2018. 2♀, locality as previous, 03.04.2018. 1♀, locality as previous, 06.04.2018. 1♀, Goren Chiflik 1 km SW, 40 m, 43.001N, 27.621E, 13.04.2018. 1♀ (DEI-GISHym31835), Dolni Chiflik 2 km SE, 50 m, 42.983N, 27.743E, 13.04.2018.

All specimens were collected from patches of *Ranunculus constantinopolitanus* (DC.) d'Urv. in damp places, often at woodland edges.

Adults are morphologically similar to *S. consobrina* (Klug, 1816), and most easily distinguished from that and other *Sciapteryx* species by the pale parts of fore wing pterostigma, costa, and subcosta (Figs 48, 49, 52, 53), as described in the key by Benson (1968). The Bulgarian specimens agree well with the original description of this species (Benson 1968), except for the following details: body length is 8–9 mm (as given also by Benson), but one male only 7mm; labial and maxillary palps largely pale, but apical palpomeres more or less dark (Fig. 50) (Benson wrote only that the labial palps are yellowish white); distal margin of tergum 1 more or less pale, but entirely black in one female (Benson wrote that apical margins of all terga are more or less pale); outer margin of tegula more or less pale, and inside dark (Fig. 51) (Benson wrote that the "front half of tegula" is pale).



Figures 48–53. *Sciapteryx byzantina*. **48, 49** female DEI-GISHym31835 habitus; **50** head. **51** Male DEI-GISHym31834 thorax; **52, 53** habitus.

The COI barcode region of DEI-GISHym88746 shows a divergence of 5.3% from the closest neighbour, *Sciapteryx laeta* Konow, 1891 (DEI-GISHym4857).

The host plants of most *Sciapteryx* species remain unrecorded, but because at least *S. costalis* and *S. consobrina* are known to use *Ranunculus* species as hosts (Lorenz and Kraus 1957; Beneš 1960), we speculate that *R. constantinopolitanus* is the larval host of *S. byzantina*.

Sciapteryx byzantina was previously known only from the type specimens, collected in European Turkey near Istanbul, and at Rize in north-eastern Turkey (Anatolia) (Benson 1968).

Strongylogaster xanthocera* (Stephens, 1835)

Material. Varna: 5♂, Staro Oryahovo 2 km SW, 120 m, 42.976N, 27.787E, 08.04.2018. 1♀, 7♂, locality as previous, 11.04.2018. All specimens swept from very young growth of *Pteridium aquilinum* (L.) Kuhn, the main host plant. Males can be identified using the characters described by Welke (1959: 253–254).

Strongylogaster xanthocera has an extensive Palaearctic distribution (Sundukov 2017), including North Africa (Blank 2002).

Tenthredo giraudi* (Taeger, 1991)

Material. Sliven: 1♂, Sliven 4 km NE, 440 m, 42.711N, 26.394E, 14.04.2018, det. A. Taeger.

Previously recorded only from Austria, Italy, and Slovenia (Taeger et al. 2006).

Xiphydriidae

Xiphydria picta* Konow, 1897

Material. Dobrich: 1♀, 1♂, Albena Kranevo, 43.35N, 28.06E, 04–05.09.1981, leg. T.-E. Leiler (Swedish Museum of Natural History, Stockholm).

Xiphydria picta is infrequently recorded, but has an extensive range in the Western Palaearctic (Sundukov 2017).

Xyelidae

Xyela curva* Benson, 1938

Material. Burgas: 5♀, 1♂, Prosenik 1 km NW, 150 m, 42.805N, 27.436E, 07.04.2018. 1♀, Burgas 8 km SE, 40 m, 42.432N, 27.527E, 10.04.2018. 1♀, Indzhe Voivoda 3 km NE, 250 m, 42.235N, 27.451E, 12.04.2018.

Varna: 1♂, Goren Chiflik, 30 m, 43.014N, 27.626E, 13.04.2018.

Most specimens swept from *Pinus nigra*.

Widespread in the Western Palaearctic throughout the natural range of *Pinus nigra* J.F.Arnold, and also on introduced *P. nigra* in more northern areas of Europe (Blank et al. 2013, with distribution map as fig. 11).

Xyela menelaus* Benson, 1960

Material. Burgas: 1♀, Prosenik 1 km NW, 150 m, 42.805N, 27.436E, 07.04.2018.

Swept from *Pinus nigra*.

The known range includes several other Balkan countries, as well as Austria and Sicily (Italy) (Blank et al. 2013).

Other species recorded in Bulgaria by MP and AL in 2018

The following species are already more or less well documented as occurring in Bulgaria. Nevertheless, in the context of their presence in the coastal areas of south-eastern Bulgaria (all of our localities in Burgas and Varna provinces), they are collectively of biogeographical interest. We list them here only with the names of the provinces in which we collected specimens.

Argidae: *Arge nigripes* (Retzius, 1783) (Burgas, Sliven), *A. ustulata* (Linnaeus, 1758) (Burgas). Cephidae: *Cephus nigrinus* Thomson, 1871 (Burgas). Pamphiliidae: *Acantholyda erythrocephala* (Linnaeus, 1758) (Burgas), *Neurotoma nemoralis* (Linnaeus, 1758) (Sliven), *Pamphilius alternans* (Costa, 1860) (Burgas, Sliven). Tenthredinidae: *Aglaostigma aucupariae* (Klug, 1817) (Burgas, Varna, Sliven), *A. fulvipes* (Scopoli, 1763) (Sliven), *Ametastegia carpini* (Hartig, 1837) (Burgas), *A. tenera* (Fallén, 1808) (Varna), *Athalia bicolor* Serville, 1823 (Burgas), *A. cordata* Serville, 1823 (Burgas, Varna, Sliven), *A. liberta* (Klug, 1815) (Sliven), *Cladius compressicornis* (Fabricius, 1804) (Burgas), *C. pectinicornis* (Geoffroy, 1785) (Burgas), *Claremontia alternipes* (Klug, 1816) (Burgas, Varna), *C. waldheimii* (Gimmerthal, 1847) (Varna), *Dolerus gonager* (Fabricius, 1781) (Burgas, Varna), *D. haematodes* (Schrank, 1781) (Pazardzhik), *D. nigratus* (O.F. Müller, 1776) (Varna), *D. picipes* (Klug, 1818) (Burgas), *D. puncticollis* Thomson, 1871 (Burgas, Varna), *D. sanguinicollis* (Klug, 1818) (Sliven), *D. triplicatus* (Klug, 1818) (Burgas), *D. vestigialis* (Klug, 1818) (Burgas, Varna), *Empria sexpunctata* (Serville, 1823) (Burgas, Varna), *Eutomostethus luteiventris* (Klug, 1816) (Varna), *Halidamia affinis* (Fallén, 1807) (Burgas , Varna, Sliven), *Hoplocampa brevis* (Klug, 1816) (Burgas, Pazardzhik), *H. minuta* (Christ, 1791) (Burgas), *Macrophya albicincta* (Schrank, 1776) (Sliven), *M. alboannulata* Costa, 1859 (Burgas, Pazardzhik, Varna, Sliven), *Mesoneura opaca* (Fabricius, 1775) (Burgas, Varna), *Monophadnoides rubi* (T. W. Harris, 1845) (Burgas), *M. ruficruris* (Brullé, 1832) (Varna, Sliven), *Monophadnus pallescens* (Gmelin, 1790) (Burgas, Varna, Sliven), *Monsoma pulveratum* (Retzius, 1783) (Varna, Sliven), *Periclista* species (approx. 7 species, not yet determined: Burgas, Varna, Sliven). *Phymatocera aterrima* (Klug, 1816) (Varna, Sliven), *Pristiphora insularis* Rohwer, 1910 (Burgas, Varna), *Rhogogaster chambersi* Benson, 1947 (Sliven), *Tenthredo dahlii* Klug, 1817 (Burgas, Sliven), *T. zona* Klug, 1817 (Burgas).

Discussion

The majority of species which MP and AL encountered in south-eastern Bulgaria have a wide European distribution (e.g. *Ardis pallipes*, *Euura pedunculi*, *Gilpinia frutetorum*, *Strongylogaster xanthocera*, and nearly all those listed above under "Other species"). They are mostly Euro-Siberian faunal elements. Many of our other records significantly extend the known range of these species to the south or south-east (e.g. *Empria pumiloides*, *Endelomyia filipendulae*, *Euura venusta*, *Parna apicalis*, and *Pristiphora depressa*). This is in keeping with the recognition of the Euxinian Province as part of the southern boundary of the Euro-Siberian Region in south-western Asia (Browicz 1989). Most of the remaining sawfly species that we collected are known either to occur rather widely in southern Europe (e.g. *Xyela menelaus*) or in South-Eastern Europe (e.g. *Tenthredo dahlii*), or at least already known from other territories in South-Eastern Europe (*Tenthredo giraudi*). Only *Empria pravei* and *Sciapteryx byzantina* are, according to the data currently available, possibly restricted in Europe to the coastal regions of the Black Sea. Note that neither species is absolutely confined to the Euxinian Province as currently defined in its restricted modern sense (Browicz 1989). According to Browicz, this extends north only to the Ropotamo River (on which lies our locality "Primorsko 4 km NW"), or perhaps to Burgas, whereas our records for both species are partly from localities a little further north, in southern parts of Varna Province.

The newly recorded localities in Bulgaria of the fenusine *Neomessa steusloffi*, far from its previously only known area of occurrence in north-eastern Germany, where it was last found more than a hundred years ago, are particularly noteworthy, but difficult to interpret. Generally, adult fenusines are under-recorded, probably as a result of their small size, often short flight period, and difficulties of identification (Smith 1976). On the other hand, the males of *N. steusloffi* are so distinctively coloured, that they should be readily recognisable. The leaf-mines of fenusines are much more easily collected than adults, and the hosts and larval stages of most European species are quite well known, so that records based on leaf-mines and larvae have greatly helped in clarifying their distribution. However, the current sum of accumulated knowledge is founded largely on morphological identification of reared adults. Although the circumstances of the Bulgarian records of *N. steusloffi* strongly suggest *Quercus* to be the larval host, we have no proof of this. Should *Quercus* really be its host, we must discard the hitherto widespread assumption that all sawfly leaf-mines found in Europe on *Quercus* belong to *Profenusa pygmaea* (Klug, 1816). Therefore, the definite identification of sawfly leaf-mines on *Quercus* requires either rearing or sequencing of the larvae, at least until characters become known which distinguish the larvae or leaf-mines of *N. steusloffi* from *P. pygmaea*. The discovery in Bulgaria of *Hoplocampa cantoti*, previously known only from three type specimens from northern France, is also surprising, but the current lack of records may only be because *H. cantoti* is not included in any of the standard identification works and superficially resembles *Hoplocampa fulvicornis* and *H. minuta*.

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