© Norwegian Journal of Entomology. 18 December 2024

Contributions to the knowledge of Aphidiinae (Hymenoptera, Braconidae) in Norway

ALF TORE MJØS, KORANA KOCIĆ & ŽELJKO TOMANOVIĆ

Mjøs, A.T., Kocić, K. & Tomanović, Ž. 2024: Contributions to the knowledge of Aphidiinae (Hymenoptera, Braconiodae) in Norway. *Norwegian Journal of Entomology* 71, 208–224.

Distributional records for 60 species of Aphidiinae collected by the "MUST Malaise" project is presented, including 29 species reported for the first time from Norway. Of these, eight are new to the fauna of Fennoscandia: *Aphidius absinthii* (Marshall, 1895), *Aphidius artemisicola* Tizado & Nunez-Perez, 1995, *A. asiaticus* (Kim & Tomanović, 2021), *A. balcanicus* (Tomanović & Petrović, 2011), *A. gifuensis* (Ashmead, 1906), *A. rubi* (Starý, 1962), *A. silvaticus* (Starý, 1962) and *Lysiphlebus volkli* (Tomanović & Kavallieratos, 2018).

Key words: Hymenoptera, Braconidae, Aphidiinae, Norway, Fennoscandia, MUST Malaise, barcodes, new records.

Alf Tore Mjøs, Museum Stavanger, Muségaten 16, NO-4010 Stavanger, Norway. E-mail: alf.tore.mjoes@museumstavanger.no

Korana Kocić, Institute of Zoology, Faculty of Biology, University of Belgrade, Studentski Trg 16, 11000 Belgrade, Serbia. E-mail: korana.kocic@bio.bg.ac.rs

Željko Tomanović, Institute of Zoology, Faculty of Biology, University of Belgrade, Studentski Trg 16, 11000 Belgrade, Serbia. E-mail: ztoman@bio.bg.ac.rs

Introduction

Braconidae remain one of the least studied insect families in Norway, and this is particularly true for the western parts of the country. The subfamily Aphidiinae are important as control agents for aphids (Aphidoidea), including many species of commercial interest as pests on agricultural produce. Despite their ecological importance this subfamily has been little studied, and only 33 species are listed by Nortaxa (Artsdatabanken 2024).

This publication gives distributional records for 60 species of Aphidiinae, of which 29 are new to the Norwegian fauna and eight are reported for the first time in Fennoscandia. There are few distributional records of Aphidiinae published from Norway which are identified by experts or verified with a voucher specimen. This is particularly true for the western parts of the country, which is covered by this study. Therefore, we have included all the records of identified specimens, also of the more commonly encountered species.

Material and methods

The majority of the approximately 3900 specimens identified in this study were caught in Malaise traps as part of the "MUST Malaise" project between 2019 and 2021. Most of the

records are from Rogaland County, with some trap sites also located in Vestland and Agder counties. A few specimens were caught in light traps or sweep netted elsewhere. Specimens were sorted to subfamily by the first author and later identified to species level by the second and third authors. All material is deposited in the collection of the Institute of Zoology, Faculty of Biology, University of Belgrade (Serbia).

Morphological terminology follows Sharkey & Wharton (1997). Specimens were examined under a ZEISS Discovery V8 stereomicroscope (Carl Zeiss MicroImaging GmbH, Göttingen, Germany). When necessary to obtain a certain identification, non-destructive extraction of the total DNA was performed with the Qiagen DNeasy® Blood & Tissue Kit (Qiagen Inc., Valencia, CA, USA). Universal primers LCO1490 and HCO2198 (Folmer et al. 1994) were used for PCR amplification of the barcode region (COI). The final volume of amplification mixture (50 µl) contained 32.6 µl of nuclease free water, 10 µl of buffer, 1 µl of each primer pair, 1 µl of nucleotides, 0.4 µl of polymerase and finally 4 µl of extracted DNA. The following PCR temperature profile was used: 60 seconds of initial denaturation, 35 cycles of 60 second denaturation (94°C), 60 second annealing (54°C) and 90 second extension (72°C) and 7 minutes of final extension (72°C). Amplification products were purified and sequenced by Macrogen Europe (the Netherlands). Obtained sequences were visualised, trimmed and aligned in BioEdit software (Hall 1999). In this study 194 samples were barcoded, and around 130 of those were successful. Sequences of the specimens are uploaded to the Barcode of Life (BOLD) and GenBank databases.

List of species

Distributional data are given according to Strand regions (Strand 1943, Endrestøl 2021), followed by municipality, location, coordinates, catching method (if other than malaise trap), number/sex of specimens, date(s), comments on barcoding, and collector.

TRIBE APHIDIINI HALIDAY, 1833

Genus *Adialytus* Förster, 1863

***Adialytus salicaphis* Fitch, 1855**

Material. RY, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 2♀♀ 1–15 June 2021, leg. Alf Tore Mjøs; Røynebergsletta kanal (58.90017N, 5.68956E), 1♀ 15–31 August 2021, leg. Alf Tore Mjøs.

Remarks. Known from Norway (Riedel & Hansen 2014). New to **RY.** Associated with genus *Chaitophorus* Koch, 1854 on *Salix*.

Genus ***Aphidius*** Nees, 1818

***Aphidius absinthii* Marshall, 1895**

Material. RY, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♀ 1–31 May 2021, leg. Alf Tore Mjøs; Røynebergsletta kanal (58.90017N, 5.68956E), 1♀ 29 June–16 July 2021; 1♀ 31 July–15 August 2021, leg. Alf Tore Mjøs.

Remarks. New to Norway and Fennoscandia (**RY**). Associated with genus *Macrosiphoniella* (Del Guecio, 1911) (Rakhshani *et al*. 2011).

***Aphidius artemisicola* Tizado & Nunez-Perez, 1995**

Material. RY, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 2♀♀ 1–15 June 2021, leg. Alf Tore Mjøs.

Remarks. New to Norway and Fennoscandia (**RY**).

***Aphidius asiaticus* Kim & Tomanović, 2021**

Material. RY, Sola: Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♀ 31 July–15 August 2021, barcoded , leg. Alf Tore Mjøs.

Remarks. New to Norway and Fennoscandia (**RY**). This species was recently described from South Korea (Kim *et al.* 2021) and is morphologically related to *A. matricariae*. However, it differs clearly from the latter by a more elongate pterostigma and a shorter flagellomere 1. Nothing is known about its biology.

***Aphidius aquilus* Mackauer, 1961**

Material. RY, Sola: Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 2♀♀3♂♂ 16–31 July 2021, barcoded; 1♀ 15 September–1 October 2021, leg. Alf Tore Mjøs; **RI**, Suldal: Vårvik (59.54282N, 6.64587E), 1♂ 17 April–29 May 2021, leg. Eva Songe Paulsen and Rune Roalkvam.

Remarks. Known from Norway. New to **RY** and **RI**.

***Aphidius avenae* Haliday, 1834**

Material. RY, Stavanger: Litla Stokkavatnet (58.96820N, 5.69072E), 2♀♀1♂ 1 July–1 August 2021, leg. Jarl Birkeland; Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♀1♂ 15–31 August 2021; 5♀♀ 31 August–15 September 2021; 1♀ 1–31 October 2021, leg. Alf Tore Mjøs; Røynebergsletta kanal (58.90017N, 5.68956E), 2♀♀ 31 July–15 August 2021; 2 ♂♂ 15–31 August 2021; 1♀ 31 August–15 September 2021, leg. Alf Tore Mjøs; Sandnes: Svanholmen (58.88878N, 5.71121E), 2♀♀1♂ 16–31 July 2021; 1♀ 15–31 August 2021, leg. Alf Tore Mjøs; **HOY**, Osterøy: Hosanger (60.56832N, 5.48575E), sweep net, 6♂♂ 2 July 2021, leg. Alf Tore Mjøs.

Remarks. Known from Norway. New to **RY** and **HOY**.

***Aphidius balcanicus* Tomanović & Petrović, 2011** (Figure 1)

Material: HOI, Ullensvang: Håradalen (59.82243N, 6.74340E), sweep net in *Salix,* 2♀♀ 4 July 2021, barcoded, leg. Alf Tore Mjøs.

Remarks. New to Norway and Fennoscandia (**HOI**).

***Aphidius cingulatus* Ruthe, 1859**

Material. TEI, Tokke: Barskor (59.42800N, 8.08618E), sweep net, 1♂ 13 June 2021, leg. Alf Tore Mjøs; **RY**, Sola: Forus, Røynebergsletta kanal (58.90017N, 5.68956E) 1♀ 1–15 June 2021; 2♀♀ 15–31 August 2021, leg. Alf Tore Mjøs.

Remarks. Known from Norway (**Ø**, Riedel & Hansen 2014). New to **TEI** and **RY**.

***Aphidius colemani* Vierieck, 1912**

Material. RY, Sola: Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♀ 15–31 August 2021, leg. Alf Tore Mjøs.

Remarks. Known from Norway (Hofsvang & Hågvar 1983). New to **RY**. A common parasitoid in commercial use, and the record could be a result of a deliberate introduction.

***Aphidius ervi* Haliday, 1834**

Material. TEI, Tokke: Barskor (59.42800N, 8.08618E), sweep net, 1♂ 13 June 2021, leg. Alf Tore Mjøs; **AAI**, Evje og Hornnes: Breidalsli (58.5301N, 7.7629E), 1♂ 1–28 June 2021; 1♀ 7 August–11 September 2021, leg. Lars Breistøl; **RY**, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E), 1♂ 1–15 June 2021; 1♀1♂ 15–31 August 2021; 3♀♀ 31 August–15 September 2021; 1♀ 15 September–1 October 2021; 1♀ 1–31 October 2021, leg. Alf Tore Mjøs; Røynebergsletta kanal (58.90017N, 5.68956E), 3♀♀ 15–31 August 2021; 1♀1♂ 31 August–15 September 2021; 1♀1♂ 15 September–1 October 2021, leg. Alf Tore Mjøs; Røynebergsletta Kanalveien (58.89832N, 5.69182E), sweep net, 1♂ 7 June 2021, leg. Alf Tore Mjøs; Sandnes: Svanholmen (58.88878N, 5.71121E), 1♀ 1–31 October 2021, leg. Alf Tore Mjøs; **RI**, Suldal: Vårvik (59.54282N, 6.64587E), 4♀♀ 27 June–3 August 2021, barcoded, leg. Eva Songe Paulsen and Rune Roalkvam; **HOY**, Osterøy: Hosanger (60.56832N, 5.48575E), 1♂ 13 July–9 August 2019; sweep net; 2♀♀5♂♂ 2 July 2021, leg. Alf Tore Mjøs; **HOI**, Ullensvang: Håradalen (59.82243N, 6.74340E), sweep net in *Salix,* 3♂♂ 4 July 2021, leg: Alf Tore Mjøs.

Remarks. Known from Norway (Hofsvang and Hågvar 1981), one of the more commonly encountered species. New to **TEI, AAI, RI, RY** and **HOI**.

***Aphidius funebris* Mackauer, 1961**

Material. RY, Stavanger: Litla Stokkavatnet (58.96820N, 5.69072E), 1♀ 1 July–1 August 2021, leg. Jarl Birkeland; Sola: Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♀ 29 June–16 July 2021, leg. Alf Tore Mjøs; **HOY**, Osterøy: Hosanger (60.56832N, 5.48575E), sweep net, 1♀

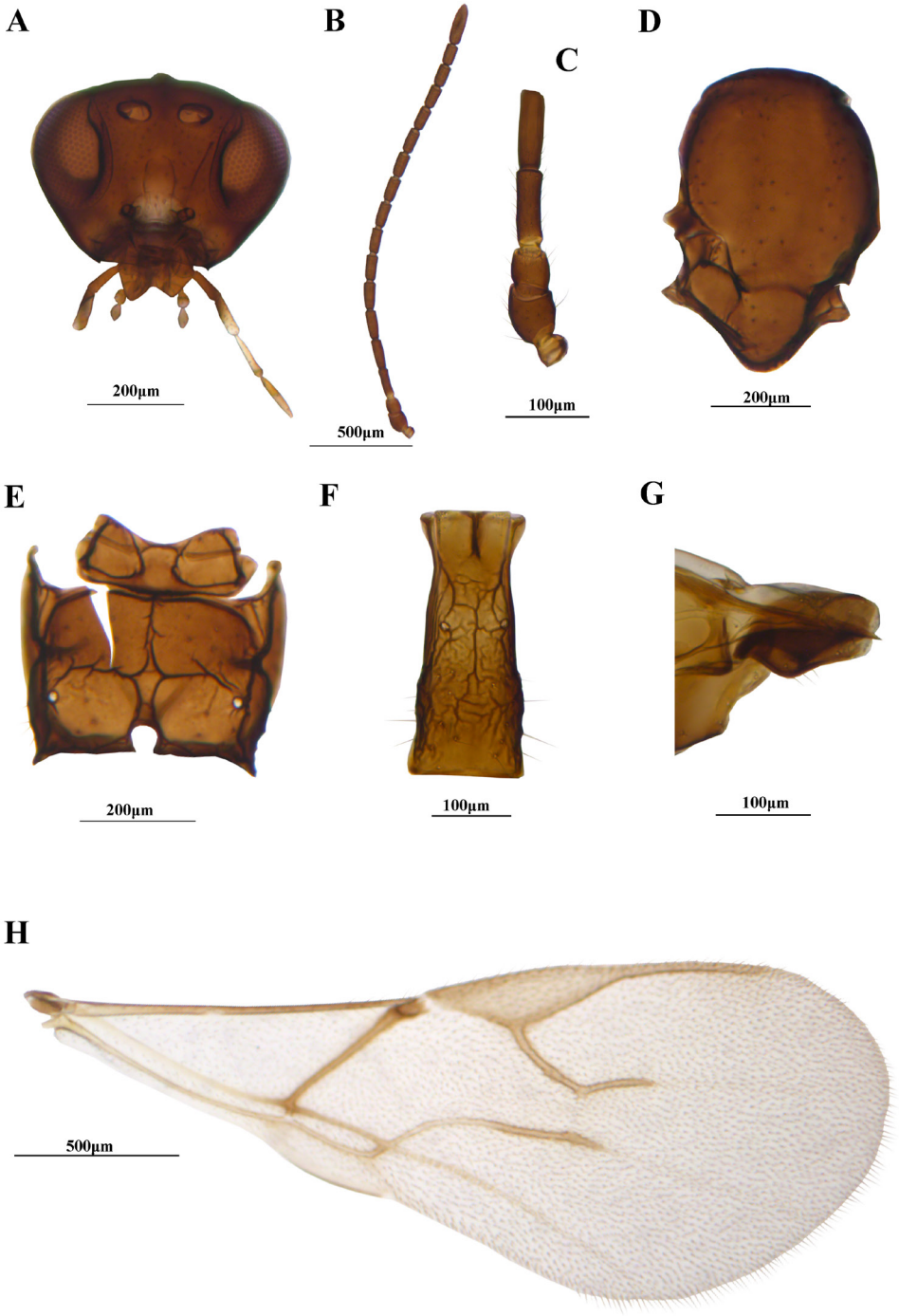

FIGURE 1. *Aphidius balcanicus* ♀ Håradalen, Ullensvang, Vestland 4 July 2021. **A**. Head. **B**. Antenna. **C**. Scape, pedicel, annelus, F_1 and F_2 flagellar segments. **D**. Mesonotum. **E**. Propodeum. **F**. Tergite I. **G**. Ovipositor sheath. **H**. Fore wing.

2 July 2021, leg. Alf Tore Mjøs.

Remarks. Known from Norway. New to **RY, RI** and **HOY**

***Aphidius gifuensis* Ashmead, 1906**

Material. RY, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♀ 15–31 August 2021, barcoded, leg. Alf Tore Mjøs; **HOY**, Osterøy: Hosanger (60.56832N, 5.48575E), sweep net, 1♀ 2 July 2021, barcoded , leg. Alf Tore Mjøs.

Remarks. New to Norway (**RY**, **HOY**) and Fennoscandia.

***Aphidius hieraciorum* Starý, 1962**

Material. RY, Sola: Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 2♀♀ 1–31 October 2021, leg. Alf Tore Mjøs; Sandnes: Svanholmen (58.88878N, 5.71121E), 1♀ 31 August–15 September 2021, leg. Alf Tore Mjøs; **RI**, Suldal: Vårvik (59.54282N, 6.64587E), 1♀ 17 April–29 May 2021; 1♀ 29 May–27 June, leg. Eva Songe Paulsen and Rune Roalkvam.

Remarks. New to Norway (**RY, RI**). Known from Sweden and Finland.

***Aphidius hortensis* Marshall, 1896**

Material. RY, Stavanger: Litla Stokkavatnet (58.96820N, 5.69072E), 1♀ 1 August–2 September 2021, leg. Jarl Birkeland.

Remarks. New to Norway (**RY**). Known from Sweden and Finland.

***Aphidius matricariae* Haliday, 1834**

Material. RY, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♀ 15–29 June 2021; 1♀ 31 August–15 September, leg. Alf Tore Mjøs; Røynebergsletta kanal (58.90017N, 5.68956E), 1♀ 31 August–15 September 2021, leg. Alf Tore Mjøs; Sandnes: Svanholmen (58.88878N, 5.71121E), 2♀♀ 15–31 August 2021, leg. Alf Tore Mjøs. **Remarks.** Known from Norway (Hofsvang & Hågvar 1983). New to **RY**.

***Aphidius rhopalosiphi* de Stafani-Perez, 1902**

Material. RY, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♀ 15–29 June 2021; 1♀ 29 June–16 July 2021; 5♀♀ 31 July–15 August 2021, barcoded; 1♀ 15–31 August 2021, barcoded; 2♀♀ 15 September–1 October 2021; 2♀♀ 1–31 October 2021, leg. Alf Tore Mjøs; Røynebergsletta kanal (58.90017N, 5.68956E), 1♀ 1–15 June 2021; 2♀♀ 29 June–16 July 2021; 4♀♀ 16–31 July 2021; 2♀♀ 15–31 August 2021, barcoded, leg. Alf Tore Mjøs; Sandnes: Svanholmen (58.88878N, 5.71121E), 1♀ 16–31 July 2021, leg. Alf Tore Mjøs; Time: Njåskogen (58.75569N, 5.68781E), 1♀ 11 August–18 September 2019, barcoded, leg. Alf Tore Mjøs; Hå: Brusand S (58.53657N, 5.75154E), 3♀♀ 27 July–17 August 2019, barcoded, leg. Alf Tore Mjøs; **RI**, Suldal: Vårvik (59.54282N, 6.64587E), 1 ♀ 3 August–3 October 2021, leg. Eva Songe Paulsen and Rune Roalkvam.

Remarks. Known from Norway, according to Artskart (Artsdatabanken 2024) the most commonly encountered *Aphidius* in Norway. New to **RI**.

***Aphidius ribis* Haliday, 1834**

Material. AAI, Evje og Hornnes: Kjetså, (58.54396N, 7.75594E), 1♀ 27 July–16 September 2019, leg. Lars Breistøl; **RY**, Sola: Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♀ 15–31 August 2021, leg. Alf Tore Mjøs; Sandnes: Svanholmen (58.88878N, 5.71121E), 1♀ 29 June–16 July 2021; 1♀ 31 August–15 September 2021, leg. Alf Tore Mjøs.

Remarks. Known from Norway. New to **AAI** and **RY**.

***Aphidius rubi* Starý, 1962** (Figure 2)

Material. RI, Suldal: Vårvik (59.54282N, 6.64587E), 1♀ 27 June–3 August, barcoded, leg. Eva Songe Paulsen and Rune Roalkvam.

Remarks. New to Norway and Fennoscandia (**RI**).

***Aphidius salicis* Haliday, 1834**

Material. AAI, Evje og Hornnes: Breidalsli (58.5301N, 7.7629E), 2 ♂♂ 24 April–1 June 2021; 3♂♂ 1–28 June 2021; 7♂♂ 29 June–7 August 2021, barcoded; 19♂♂ 7 August–11 September 2021, leg. Lars Breistøl; **RY**, Sola: Forus, Røynebergsletta plen (58.90041N,

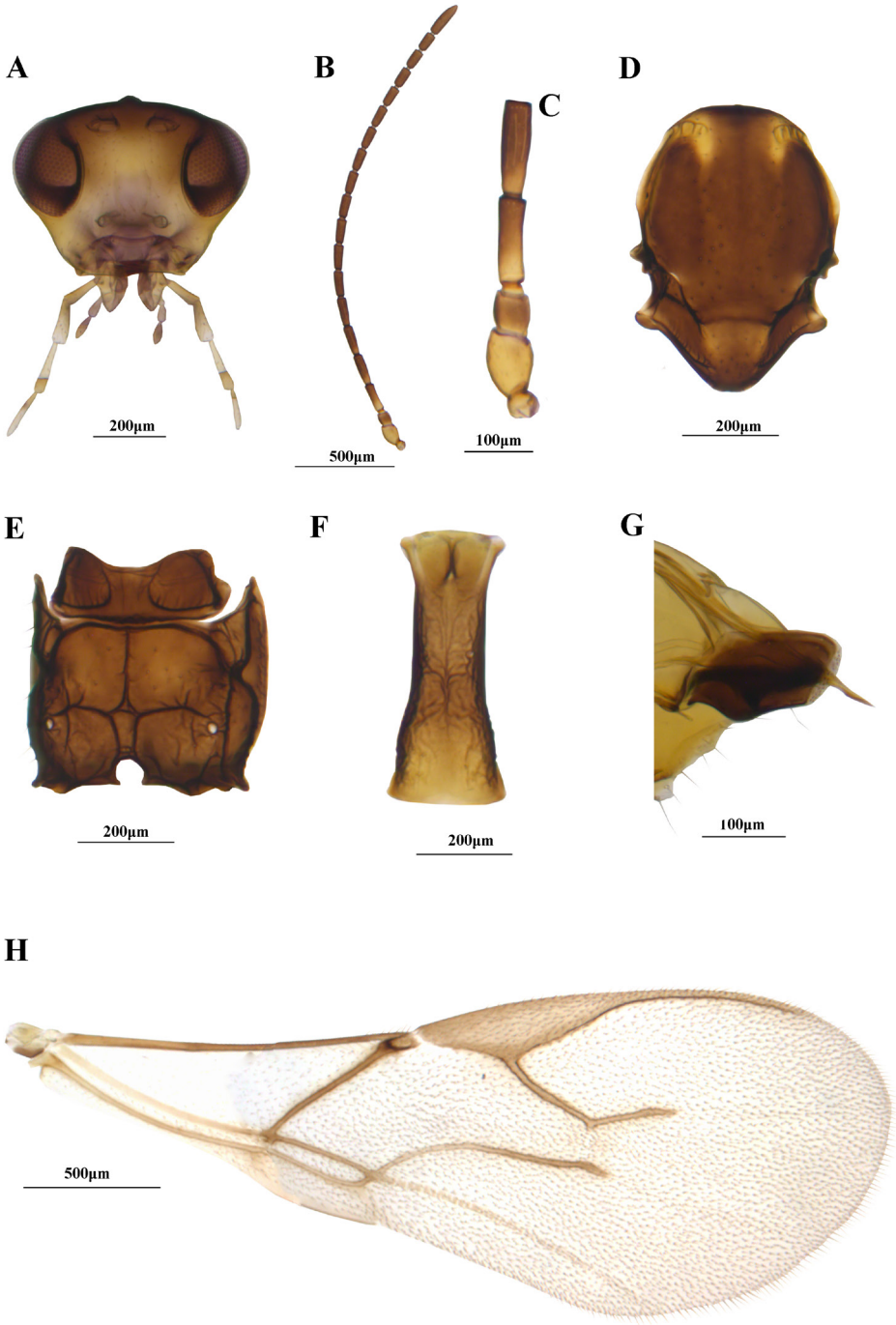

FIGURE 2. *Aphidius rubi* ♀Vårvik, Suldal, Rogaland 27 June–3 August 2021. **A**. Head. **B**. Antenna. **C**. Scape, pedicel, annelus, F1 and F2 flagellar segments. **D**. Mesonotum. **E**. Propodeum. **F**. Tergite I. **G**. Ovipositor sheath. **H**. Fore wing.

5.68971E9), 1♀1♂ 15–29 June 2021; 1♀1♂ 29 June–16 July 2021; 1♀ 1–31 October 2021, leg. Alf Tore Mjøs; Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 2♀♀1♂ 31 July–15 August 2021, leg. Alf Tore Mjøs; Sandnes: Svanholmen (58.88878N, 5.71121E), 1♀ 16–31 July 2021; 6♀♀1♂ 15–31 August 2021; 4♀♀1♂ 31 August–15 September 2021, leg. Alf Tore Mjøs; Hå: Brusand S (58.53657N, 5.75154E), 1♀ 27 July–17 August 2019, leg. Alf Tore Mjøs.

Remarks. New to Norway (**AAI, RY**). Known from Sweden and Finland.

***Aphidius setiger* Mackauer, 1961**

Material. RY, Klepp: Revtangen Bird Observatory (58.76181N, 5.50807E), light trap, 1♀ 1 August 2019, leg. Alf Tore Mjøs; **HOY**, Osterøy: Hosanger (60.56832N, 5.48575E), 1♀ 13 July–9 August 2019, leg. Alf Tore Mjøs.

Remarks. New to Norway (**RY, HOI**). Known from Sweden and Finland.

***Aphidius silvaticus* Starý, 1962**

Material. RY, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♀ 1–15 June 2021; 1♀ 29 June–16 July 2021; 1♀ 31 July–15 August 2021, barcoded , leg. Alf Tore Mjøs.

Remarks. New to Norway and Fennoscandia (**RY**).

***Aphidius schimitscheki* Starý, 1960**

Material. RY, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♀ 31 August–15 September 2021; 1♀ 1–31 October 2021, leg. Alf Tore Mjøs; Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♀1♂ 1–15 June 2021; 1♀ 31 August–15 September 2021, leg. Alf Tore Mjøs; Klepp: Revtangen Bird Observatory (58.76181N, 5.50807E), light trap, 11♂♂ 1 August 2019, leg. Alf Tore Mjøs; Time: Njåskogen (58.75569N, 5.68781E), 1♂ 16 July–11 August 2019, leg. Alf Tore Mjøs.

Remarks. New to Norway (**RY**). Known from Sweden and Finland.

***Aphidius tanacetarius* Mackauer, 1962**

Material. RY, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♀ 15–29 June 2021; 1♀ 31 August–15 September 2021, leg. Alf Tore Mjøs; **RI**, Suldal: Vårvik (59.54282N, 6.64587E), 3 ♀♀ 29 May–27 June, leg. Eva Songe Paulsen and Rune Roalkvam.

Remarks. New to Norway (**RY, RI**). Known from Sweden. Specialized parasitoid of *Metopeurum* (Mordvilko, 1914) on *Tanacetum*.

***Aphidius urticae* Haliday, 1834**

Material. RY, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♀ 29 June–16 July 2021; 1♀ 31 August–15 September 2021, leg. Alf Tore Mjøs; Time: Njåskogen (58.75569N, 5.68781E), 11♀♀ 16 July–11 August 2019, leg. Alf Tore Mjøs; **HOY**, Osterøy: Hosanger (60.56832N, 5.48575E), sweep net, 3♂♂ 2 July 2021, leg. Alf Tore Mjøs.

Remarks. Known from Norway (Riedel & Hansen 2014). New **HOY**.

***Aphidius uzbekistanicus* Luzhetski, 1960**

Material. RY, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 3♀♀ 31 August–15 September 2021, leg. Alf Tore Mjøs.

Remarks. Known from Norway (Starý 1981). New to **RY** and **HOY**.

Genus *Binodoxys* Mackauer, 1960

***Binodoxys angelicae* Haliday, 1833**

Material. RY, Sola: Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♂ 31 July–15 August 2021, leg. Alf Tore Mjøs.

Remarks. Known from Norway (Westrum et al. 2010). New to **RY**.

***Binodoxys brevicornis* Haliday, 1833**

Material. RY, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♀ 29 June–16 July 2021, leg. Alf Tore Mjøs; Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♀ 16–31 July 2021, barcoded; 1♀ 31 August–15 September 2021, leg. Alf Tore Mjøs; Sandnes: Svanholmen (58.88878N, 5.71121E), 2♀♀ 15–31 August 2021, leg. Alf Tore Mjøs; **HOY**, Osterøy: Hosanger (60.56832N, 5.48575E), sweep net, 3♀ 2 July 2021, leg. Alf Tore Mjøs.

Remarks. New to Norway (**RY, HOY**). Some

Norwegian specimens of this species have 11 antennal segments, as opposed to 10 segments which is given in the species descriptions (Talebi *et al*. 2009, Tomanović *et al*. 2021).

Genus *Diaeretellus* Starý, 1960

***Diaeretellus ephippium* Haliday, 1834** (Figure 3)

Material. AAI, Evje og Hornnes: Breidalsli (58.5301N, 7.7629E), 1♀ 9 October–5 November 2021, barcoded, leg. Lars Breistøl; **RY,** Sandnes: Svanholmen (58.88878N, 5.71121E), 2♀♀1♂ 1–31 October 2021, barcoded, leg. Alf Tore Mjøs.

Remarks. New to Norway (**AAI, RY**). The female of this species is apterous.

Genus *Diaeretiella* Starý, 1960

***Diaeretiella rapae* McIntosh, 1855**

Material. RY, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♀ 31 August–15 September 2021; 1♀ 1–31 October 2021, leg. Alf Tore Mjøs; Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♀ 29 June–16 July 2021; 1♀ 31 August–15 September 2021, leg. Alf Tore Mjøs; Sandnes: Svanholmen (58.88878N, 5.71121E), 1♀ 1–31 October 2021, leg. Alf Tore Mjøs.

Remarks. Known from Norway (Hofsvang & Hågvar 1983). New to **RY**.

Genus *Diaeretus* Förster, 1863

***Diaeretus leucopterus* Haliday, 1834**

Material. RY*,* Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♂ 29 June–16 July 2021, barcoded ; 1♂ 31 July–15 August 2021, leg. Alf Tore Mjøs.

Remarks. New to Norway **(RY)**.

Genus *Lysiphlebus* Förster, 1863

***Lysiphlebus cardui* Marshall, 1896**

Material. RY*,* Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♀ 29 June–16 July 2021, leg. Alf Tore Mjøs; Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♀ 29 June–16 July 2021, leg. Alf Tore Mjøs.

Remarks. Known from Norway (Westrum *et al*. 2010). It is not listed from Finland. Also not listed from Sweden (Dyntaxa 2024), but Swedish material is listed by Tomanović *et al*. (2018). New to **RY.** A parasitoid of *Aphis* (Linnaeus, 1758) and *Brachycaudus* (van der Goot, 1913) species.

***Lysiphlebus fabarum* Marshall, 1896**

Material. RY, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♀ 1–15 June 2021, leg. Alf Tore Mjøs; Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♀ 16–31 July 2021, leg. Alf Tore Mjøs.

Remarks. New to Norway (**RY**). The most common species in this genus in Europe. It is also one of the most polyphagous species, parasitizing many different aphid genera (Tomanović *et al*. 2018).

***Lysiphlebus hirticornis* Mackauer, 1960**

Material. RY, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♀ 15–31 August 2021, leg. Alf Tore Mjøs.

Remarks. New to Norway (**RY**). A specialist parasitoid on *Metopeurum fuscoviride* (Stroyan, 1950), an Aphid feeding on *Tanacetum vulgare* (Tomanović *et al*. 2018).

***Lysiphlebus volkli* Tomanović & Kavallieratos, 2018**

Material. RY, Sola: Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♀ 16–31 July 2021, barcoded, leg. Alf Tore Mjøs.

Remarks. New to Norway and Fennoscandia (**RY**). *Lysiphlebus volkli* is similar to *L. cardui* regarding host range and morphology. Both parasitize the *Aphis fabae* (Scopoli, 1763) complex and are quite similar in appearance. *Lysiphlebus volkli* has a more elongate stigma and a somewhat shorter metacarpal vein than *L. cardui*, as well as minor differences in the basal flagellomeres (Tomanović *et al*. 2018).

Genus *Falciconus* Mackauer, 1961

***Falciconus pseudoplatani* Marshall, 1896**

Material. RY, Sandnes: Svanholmen (58.88878N, 5.71121E), 1♂ 1–31 October 2021,

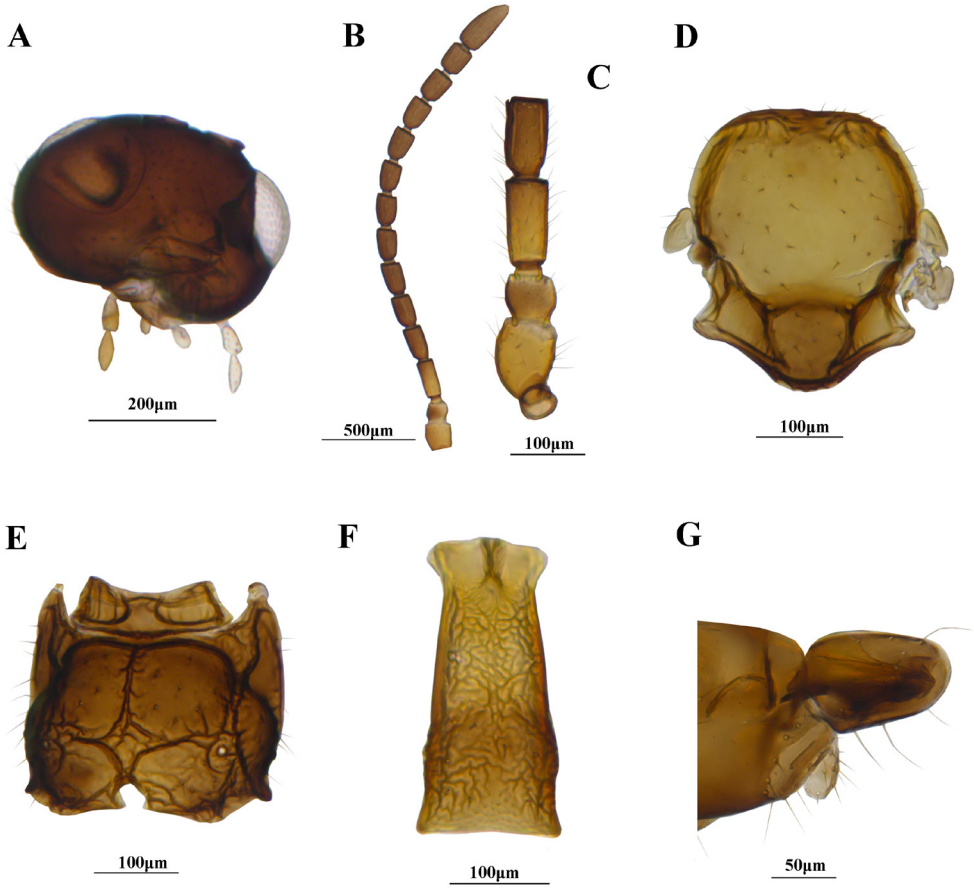

FIGURE 3. *Diaeretellus ephippium* ♀ Breidalsli, Evje og Hornnes, Agder 9 October–5 November 2021. **A**. Head. **B**. Antenna. **C**. Scape, pedicel, annelus, F1 and F2 flagellar segments. **D**. Mesonotum. **E**. Propodeum. **F**. Tergite I. **G**. Ovipositor sheath.

leg. Alf Tore Mjøs.

Remarks. Known from Norway (Hofsvang & Hågvar 1983). New to **RY**.

Genus ***Monoctonus*** Haliday, 1833

Monoctonus caricis Haliday, 1833

Material. **AAI**, Evje og Hornnes: Breidalsli (58.5301N, 7.7629E), 1♀ 1–29 June 2021, leg. Lars Breistøl; **RY**, Stavanger: Litla Stokkavatnet (58.96820N, 5.69072E), 1♀ 24 April–31 May 2021; 1♀ 1 June–1 July 2021, leg. Jarl Birkeland; Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♂ 15–31 August 2021; 1♀ 1–31 October 2021, leg. Alf Tore Mjøs; Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♀ 1–31 May 2021; 3♀♀1♂ 1–15 June 2021; 1♀ 15–29 June 2021; 1♀ 31 July–15 August 2021, leg. Alf Tore Mjøs; Sandnes: Svanholmen (58.88878N, 5.71121E), sweep net, 1♀ 29 May 2021; 1♀ 1–31 October 2021, leg. Alf Tore Mjøs; **RI**, Suldal: Vårvik (59.54282N, 6.64587E), 17♀♀2♂♂ 29 May–27 June 2021; 2♀♀1♂ 27 June–3 August 2021, leg. Eva Songe Paulsen and Rune Roalkvam; **HOY**, Osterøy: Hosanger (60.56832N, 5.48575E), sweep net, 1♂ 2 July 2021, leg. Alf Tore Mjøs.

Remarks. Known from Norway (Mackauer & Starý 1967). New to **AAI, RY, RI** and **HOY**.

Genus ***Pauesia*** Quilis Pérez, 1931

Pauesia similis Starý, 1966

Material. **AAI**, Evje og Hornnes: Breidalsli (58.5301N, 7.7629E), 3♀♀ 29 June–7 August 2021, all three specimens barcoded, leg. Lars Breistøl.

Remarks. New to Norway (**AAI**).

Pauesia infulata Haliday, 1834

Material. **AAI**, Evje og Hornnes: Breidalsli (58.5301N, 7.7629E), 1♀ 29 June–7 August 2021, barcoded, leg. Lars Breistøl.

Remarks. New to Norway (**RY**).

Genus ***Pseudopauesia*** Halme, 1986

Pseudopauesia prunicola **Halme, 1986**

Material. RY, Sola: Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♀ 1–15 June 2021, barcoded, leg. Alf Tore Mjøs.

Remarks. New to Norway (**RY**).

Genus ***Trioxys*** Haliday, 1833

Trioxys auctus **Haliday, 1833**

Material. RY, Stavanger: Litla Stokkavatnet (58.96820N, 5.69072E), 1♀ 1 July–1 August 2021, leg. Jarl Birkeland; Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 9♀♀ 29 June–16 July 2021, leg. Alf Tore Mjøs; Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 7♀♀ 16–31 July 2021, leg. Alf Tore Mjøs; **RI**, Suldal: Vårvik (59.54282N, 6.64587E), 1♀ 27 June–3 August 2021, leg. Eva Songe Paulsen and Rune Roalkvam.

Remarks. Known from Norway (Westrum et al. 2010). New to **RY** and **RI**.

Trioxys cirsii **Curtis, 1831**

Material. HOY, Osterøy: Hosanger (60.56832N, 5.48575E), sweep net, 1♀ 2 July 2021, leg. Alf Tore Mjøs

Remarks. New to Norway (**HOY**).

Trioxys pallidus **Haliday, 1833**

Material. RY, Time: Njåskogen (58.75569N, 5.68781E), 2♀♀ 11 August–18 September 2019, leg Alf Tore Mjøs.

Remarks. Known from Norway.

Trioxys sunnysidensis **Fulbright & Pike, 2007**

Material. AAI, Evje og Hornnes: Kjetså (58.54396N, 7.75594E), 1♀ 27 July–16 September 2019, leg. Lars Breistøl; **RY**, Stavanger: Litla Stokkavatnet (58.96820N, 5.69072E), 4♀♀ 1 August–2 September 2021, barcoded, leg. Jarl Birkeland; Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 404♀♀, 1♂ 1–15 June 2021, barcoded; 68 ♀♀ 29 June–16 July 2021; 366♀♀ 15–31 August 2021, barcoded, leg. Alf Tore Mjøs; Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 7♀♀ 16–31 July 2021; 151♀♀ 15–31 August 2021; 1♀ 31 August–15 September 2021, leg. Alf Tore Mjøs; Sandnes: Svanholmen (58.88878N, 5.71121E), 2♀♀ 29 June–16 July 2021; 2♀♀ 16–31 July 2021; 1♀ 31 August–15 September 2021; 1♀ 1–31 October 2021, leg. Alf Tore Mjøs.

Remarks. Known from Norway. New to **AAI**. Extremely common species, occurring in huge numbers in malaise samples from a grass lawn at Røynebergsletta. *Trioxys sunnysidensis* is a parasitoid of the bird cherry-oat aphid *Rhopalosiphum padi* (Linnaeus, 1758), a major cereal pest with an almost cosmopolitan distribution (Fulbright & Pike 2007).

Trioxys tenuicaudus **Stary, 1978**

Material. RY, Sola: Røynebergsletta plen (58.90041N, 5.68971E), 1 ♀ 29 June–16 July 2021, barcoded, leg. Alf Tore Mjøs.

Remarks. New to Norway (**RY**).

TRIBE EPHEDRINI MACKAUER, 1961

Genus *Ephedrus* Haliday, 1833

Ephedrus cerasicola **Starý, 1962**

Material. RY, Sandnes: Svanholmen (58.88878N, 5.71121E), 2♀♀1♂ 15–31 August 2021, leg. Alf Tore Mjøs.

Remarks. Known from Norway (Hofsvang & Hågvar 1983). New to **RY**.

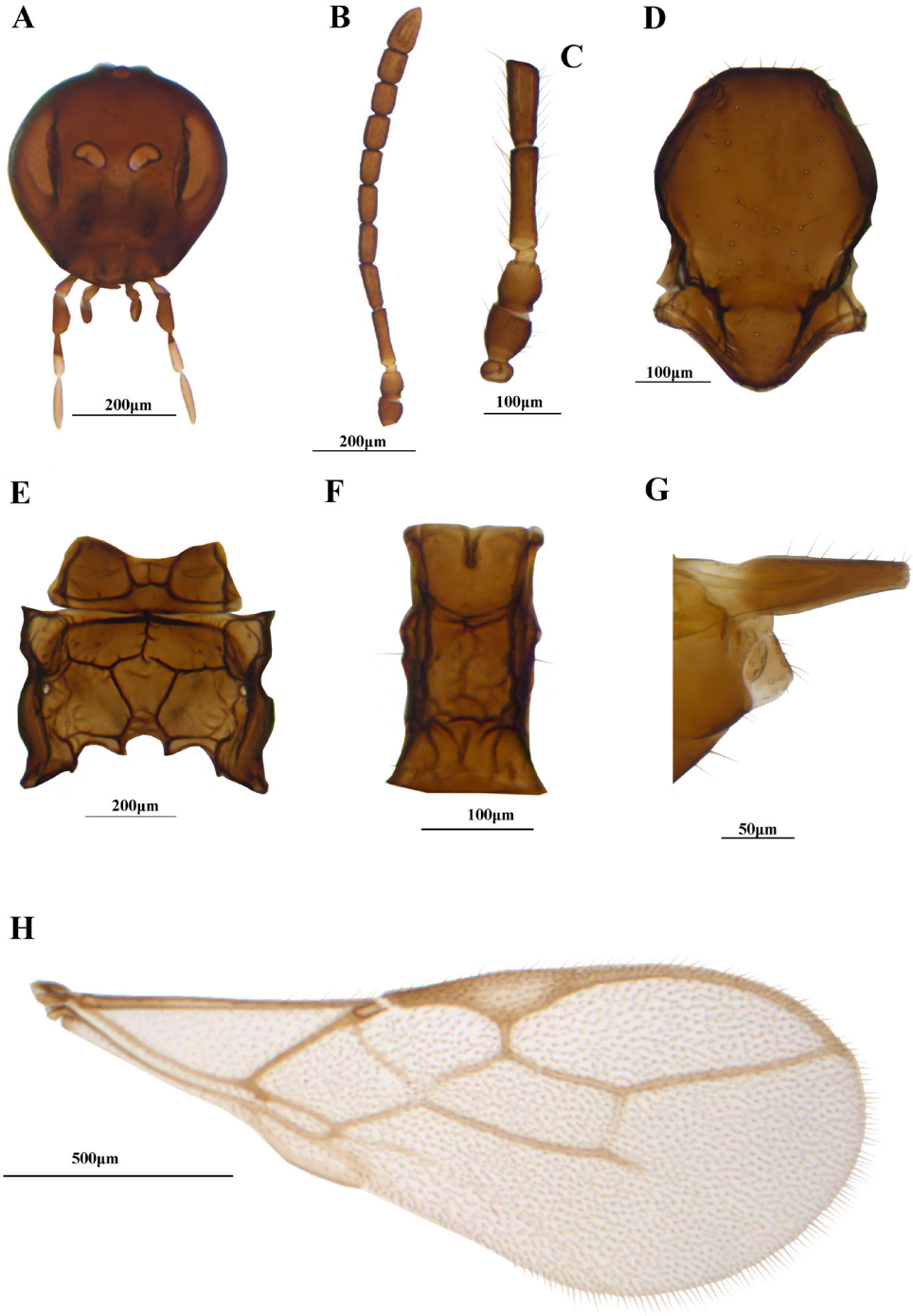

FIGURE 4. *Ephedrus helleni* ♀ Røynebergsletta, Forus, Sola, Rogaland 29 June–16 July 2021. **A**. Head. **B**. antenna. **C**. Scape, pedicel, annelus, F1 and F2 flagellar segments. **D**. Mesonotum. **E**. Propodeum. **F**. Tergite I. **G**. Ovipositor sheath. **H**. Fore wing.

***Ephedrus helleni* Mackauer, 1968** (Figure 4)

Material. RY, Sola: Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 2♀♀ 29 June–16 July 2021, barcoded , leg. Alf Tore Mjøs.

Remarks. New to Norway (**RY**).

***Ephedrus koponeni* Halme, 1992**

Material. AAI, Evje og Hornnes: Breidalsli (58.5301N, 7.7629E), 2♀♀1♂ 29 June–7 August 2021; 1♀ 7 August–11 September 2021, barcoded, leg. Lars Breistøl

Remarks. New to Norway (**AAI**).

***Ephedrus lacertosus* Haliday, 1833**

Material. AAI, Evje og Hornnes: Breidalsli (58.5301N, 7.7629E), 1♂ 29 June–7 August 2021, leg. Lars Breistøl; **RY**, Stavanger: Litla Stokkavatnet (58.96820N, 5.69072E), 1♀ 1 July–1 August 2021, leg. Jarl Birkeland; Hå: Brusand S (58.53657N, 5.75154E), 1♀ 27 July–17 August 2019, leg. Alf Tore Mjøs; Finnøy: Kvidevig (59.14397N, 5.78984E), 1♀ 1 June–3 July 2021; 1♀1♂ 3 July–1 August 2021, barcoded; 1♀ 1 August–12 September 2021, barcoded, leg. Gaute Tengesdal; **RI**, Suldal: Vårvik (59.54282N, 6.64587E), 1♂ 17 April–29 May 2021; 1♂ 29 May–27 June 2021; 2♀♀2♂♂ 27 June–3 August 2021, barcoded, leg. Eva Songe Paulsen and Rune Roalkvam.

Remarks. Known from Norway. New to **AAI** and **RI**.

***Ephedrus niger* Gautier, Bonnamour & Gaumont, 1929**

Material. RY, Stavanger: Litla Stokkavatnet (58.96820N, 5.69072E), 2♀♀2♂♂ 1 July–1 August 2021, leg. Jarl Birkeland; Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 6♀♀ 15–31 August 2021; 3♀♀ 31 August–15 September 2021, leg. Alf Tore Mjøs; Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♀2♂♂ 31 July–15 August 2021; 3♀♀1♂ 15–31 August 2021; 7♀♀2♂♂ 31 August–15 September 2021; 2♀♀3♂♂ 15 September–1 October 2021, leg. Alf Tore Mjøs; Sandnes: Svanholmen (58.88878N, 5.71121E), 1♀ 16–31 July 2021, leg Alf Tore Mjøs; **RI**, Suldal: Vårvik (59.54282N, 6.64587E), 2♀♀ 27 June–3 August 2021, leg. Eva Songe Paulsen and Rune Roalkvam; **HOY**, Osterøy: Hosanger (60.56832N, 5.48575E), sweep net, 5♀♀1♂ 2 July 2021, leg. Alf Tore Mjøs; **HOI**, Ullensvang: Håradalen (59.82243N, 6.74340E), sweep net in *Salix,* 2♀♀ 4 July 2021, leg: Alf Tore Mjøs.

Remarks. New to Norway (**RY, RI, HOY** and **HOI**).

***Ephedrus persicae* Froggat, 1904**

Material. RY, Sola: Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♀ 29 June–16 July 2021, leg. Alf Tore Mjøs.

Remarks. Known from Norway (Mackauer 1968, Westrum *et al*. 2010). New to **RY**. A known parasitoid on aphids of the genus *Myzus* (Passerini, 1860) on *Prunus* (Westrum *et al*. 2010).

***Ephedrus plagiator* Nees, 1811**

Material. AAI, Evje og Hornnes: Kjetså, (58.54396N, 7.75594E), 1♀1♂ 27 July–16 September 2019, barcoded, leg. Lars Breistøl; Breidalsli (58.5301N, 7.7629E), 1♀1♂ 24 April–1 June 2021; 1♀ 1–29 June 2021; 1♀ 29 June–7 August 2021, leg. Lars Breistøl; **RY**, Stavanger: Litla Stokkavatnet (58.96820N, 5.69072E), 1♀ 24 April–31 May 2021; 3♀♀ 1 June–1 July 2021; 1♀6♂♂ 1 July–1 August 2021; 3♀♀1♂ 2 September–9 October 2021, leg. Jarl Birkeland; Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♂ 1–31 May 2021; 3♀♀2♂♂ 1–15 June 2021; 1♀ 29 June–16 July 2021; 2♀♀1♂ 15-31 August 2021; 24 ♀♀1♂ 31 August–15 September 2021; 1♀ 1–31 October 2021, leg. Alf Tore Mjøs; Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♂ 15–29 June 2021; 4♀♀1♂ 31 August–15 September 2021, leg. Alf Tore Mjøs; **RI**, Suldal: Vårvik (59.54282N, 6.64587E), 1♂ 27 June–3 August 2021, leg. Eva Songe Paulsen and Rune Roalkvam; **HOY**, Osterøy: Hosanger (60.56832N, 5.48575E), 2♂♂ 13 July–9 August 2019; sweep net, 2♀♀ 2 July 2021, leg. Alf Tore Mjøs.

Remarks. Known from Norway (Mackauer 1968, Starý 1981). New to **RI** and **HOY**.

***Ephedrus validus* Haliday, 1833**

Material: AAI, Evje og Hornnes: Breidalsli

(58.5301N, 7.7629E), 1♀ 7 August–11 September 2021, leg. Lars Breistøl; **RY**, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♀ 31 August–15 September, leg. Alf Tore Mjøs; Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♀ 29 June–16 July 2021; 1♀ 16–31 July 2021; 1♀ 15–31 August 2021; 1♀1♂ 31 August–15 September 2021, leg. Alf Tore Mjøs; Sandnes: Svanholmen (58.88878N, 5.71121E), 3♀♀ 15–31 August 2021, leg. Alf Tore Mjøs.

Remarks. Known from Norway (Riedel & Hansen 2014). New to **AAI** and **RY**.

Genus *Toxares* Haliday, 1840

***Toxares deltiger* Haliday, 1833**

Material. TEI, Tokke: Barskor (59.42800N, 8.08618E), sweep net, 1♂ 13 June 2021, barcoded, leg. Alf Tore Mjøs; **RY**, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 2♀♀ 29 June–16 July 2021, barcoded; 1♀ 16–31 July 2021; 3♀♀ 15–31 August 2021, barcoded; 3♀♀ 31 August–15 September 2021, barcoded, leg. Alf Tore Mjøs; Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 2♂♂ 1–15 June 2021, barcoded; 1♀ 29 June–16 July 2021, barcoded; 1♀ 31 July–15 August 2021, barcoded; 6♀♀2♂♂ 15–31 August 2021, barcoded; 2♀♀6♂♂ 31 August–15 September 2021, barcoded, leg. Alf Tore Mjøs; Sandnes: Svanholmen (58.88878N, 5.71121E), 1♀ 16–31 July 2021, barcoded; 1♀1♂ 31 August–15 September 2021, barcoded, leg. Alf Tore Mjøs.

Remarks. Known from Norway (Hellén 1963, 1966). A very common generalist species on a number of different aphid genera. New to **RY.**

TRIBE PRAINI MACKAUER, 1961

Genus *Dyscritulus* Hincks, 1943

***Dyscritulus planiceps* Marshall, 1896**

Material. RY, Sola: Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♂ 31 July–15 August 2021, leg. Alf Tore Mjøs.

Remarks. New to Norway (**RY**).

Genus *Praon* Haliday, 1833

***Praon abjectum* Haliday, 1833**

Material. RY, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 2♀♀ 15–31 August 2021, barcoded; 1♀ 31 August–15 September 2021, barcoded, leg. Alf Tore Mjøs; Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♀3♂♂ 15–29 June 2021; 1♀ 31 July–15 August 2021, barcoded, leg. Alf Tore Mjøs; Hå: Brusand S (58.53657N, 5.75154E), 3♀♀ 27 July–17 August 2019, barcoded, leg. Alf Tore Mjøs.

Remarks. Known from Norway (Starý 1981). New to **RY**.

***Praon dorsale* Haliday, 1833**

Material. RI, Suldal: Vårvik (59.54282N, 6.64587E), 1♀ 3 August–3 October 2021, barcoded, leg. Eva Songe Paulsen and Rune Roalkvam.

Remarks. Known from Norway (Riedel & Hansen 2014). New to **RI**.

***Praon flavinode* Haliday, 1833**

Material. RY, Sola: Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 3♂♂ 31 July–15 August 2021, barcoded, leg. Alf Tore Mjøs; **RI**, Suldal: Vårvik (59.54282N, 6.64587E), 1♀ 3 August–3 October 2021, leg. Eva Songe Paulsen and Rune Roalkvam.

Remarks. Known from Norway. New to **RI**.

***Praon gallicum* Starý, 1971**

Material. RY, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♀ 1–31 May 2021; 1♀ 1–15 June 2021; 1♀ 31 July–15 August 2021, barcoded, leg. Alf Tore Mjøs.

Remarks. Known from Norway (Starý 1981). New to **RY.**

***Praon necans* Mackauer, 1959**

Material. RY, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♀ 1–15 June 2021; 2♀♀ 31 July–15 August 2021, barcoded, leg. Alf Tore Mjøs; Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♀ 31 July–15 August 2021; 1♀ 31 August–15 September 2021, barcoded, leg. Alf Tore Mjøs.

Remarks. New to Norway (**RY**).

***Praon volucre* Haliday, 1833**

Material. RY, Sola: Forus, Røynebergsletta plen (58.90041N, 5.68971E9), 1♂ 15–31 August 2021, leg. Alf Tore Mjøs; Forus, Røynebergsletta kanal (58.90017N, 5.68956E), 1♂ 29 June–16 July 2021, leg. Alf Tore Mjøs; **HOY**, Osterøy: Hosanger (60.56832N, 5.48575E), 1♀ 13 July–9 August 2019, leg. Alf Tore Mjøs.

Remarks. Known from Norway (Edland 1976, Starý 1981). New to **HOY**.

Discussion

The subfamily Aphidiinae consists of obligatory endoparasitoids of aphids (Aphididae). Over 500 species are known worldwide (Yu *et al*. 2016). Recognised for their role as biological control agents of various aphid pests, this family is relatively well studied, particularly in Europe (Kocić *et al.* 2024).

This study presents distributional data for 60 species of Aphidiinae, of which 29 are new to the Norwegian fauna. The number of species of Aphidiinae listed by Nortaxa prior to this study was only 33 (Nortaxa 2024), which is a very low number compared to other Nordic countries (Kocić *et al*. 2024). Nortaxa aims to compile a complete list of all Norwegian species (Artsdatabanken 2024). Still, we discovered 14 species of Aphidiinae listed by various authors from Norway and Svalbard that are missing from this database (Stary 1981, Hofsvang & Hågvar 1983, Westrum *et al.* 2010, Chaubet *et al.* 2013). One species, *Aphidius gifuensis*, is listed in Nortaxa based seemingly on metabarcoding records only. This species is therefore listed here as new to Norway. The total number of Aphidiinae

FIGURE 5. *Trioxys sunnysidensis* Fulbright & Pike, 2007 is a common parasitoid on *Rhopalosiphum padi* (L.), a major cereal pest.

known from Norway prior to this study should then be 46. The 29 species presented here as new to Norway should take the number of Aphidiinae on the Norwegian checklist to 75. This is still a very low number, compared to e.g. 119 species known from Sweden (SLU Artdatabanken 2024). We have commented also on regional status, if species are new to respective regions according to the Strand system (Strand 1943, Endrestøl 2021). For some species there are a considerable number of metabarcoding records listed in Artskart (Artsdatabanken 2024). In this study we have disregarded metabarcoding, since we advocate the view that sufficient documentation require reference specimens and/or confirmation by an expert on this subfamily.

Some genera of the subfamily are characterized by subtle morphological variations between species, making the identification hard, especially without the information on trophic interactions, which is the case when Malaise trapping is implemented. Therefore, barcoding is an important tool for confirming the identification in many cases when working with Aphidiinae. In this study, for 194 samples DNA was extracted , to confirm the morphological identification of the specimens. Around 130 of those were successful and in 64 specimens DNA extraction failed, possibly due to DNA degradation. Barcoding also confirmed the identity of huge numbers of *Trioxys sunnysidensis* in samples from a grass lawn at Røynebergsletta in Rogaland County in 2021 (Figure 5). More than 800 specimens were identified from this single trap location. *Trioxys sunnysidensis* was originally described from North America as a parasitoid of the bird cherry-oat aphid *Rhopalosiphum padi*, a major cereal pest with an almost cosmopolitan distribution (Fulbright & Pike 2007). In 2019 *Trioxys sunnysidensi*s was reported as a common and potentially very important control agent for *R. padi* also in Europe. Barcodes from *T. sunnysidensis* from Germany were matched against unidentified material in BOLD, identifying additional records in UK, Germany and Norway (Čkrkić *et al.* 2019). This example highlights the usefulness of barcoding and the value of uploading barcodes from unidentified specimens to the BOLD database. *R. padi* is predominantly a pest on common wheat *Triticum aestivum*, arguably the most important crop grown worldwide. *Trioxys sunnysidensis* could play a significant role in the biological control of this aphid (Čkrkić *et al.* 2019), and the huge numbers recorded in this trap set at Jæren in Rogaland might indicate that they have done so for a long time without our knowledge.

Five of the species recorded for the first time in Norway in this study were described after 1985, the most recent being *Aphidius asiaticus* from 2021 (Kim *et al.* 2021). Despite the much longer lists of Aphidiinae recorded in Sweden and Finland, no less than eight of the species recorded in "MUST Malaise" are also new to Fennoscandia (FinBIF 2024, SLU Artdatabanken 2024, Davidian & Humala 2023). Western Norway has a different, more oceanic climate than most of Fennoscandia. In addition, the diversity of habitats is great and the distance from sea level to alpine regions is often short in the fjord districts. We suspect that the poorly studied Aphidiinae fauna of Norway may still hold many surprises, and indeed the samples so far studied from "MUST Malaise" also produced four species new to science (Kocić *et al*. 2024).

Acknowledgements. We would like to thank Equinor and Forus Næringspark for interesting research opportunities and financial support for this study. We also thank Bess Jahres Stiftelse for funding high-quality stereo microscopes and barcoding of specimens for this study. Jarl Birkeland, Arild Breistøl, Lars Breistøl, Svein Are Mjøs, Eva Songe Paulsen, Rune Roalkvam and Gaute Tengesdal assisted in collecting the specimens studied.

References

Artsdatabanken (2020). Artskart. https://artskart.artsdatabanken.no/ Accessed 20.XI.2024.

Artsdatabanken 2024. Nortaxa - Norsk taksonomisk register. https://nortaxa.artsdatabanken.no Accessed 19.IX.2024

Chaubet, B., Derocles, S.A.P., Hullé, M., Ralec, A.L., Outreman, Y., Simon, J-C. & Tomanović, Ž. 2013. Two new species of aphid parasitoids (Hymenoptera, Braconidae, Aphidiinae) from the high arctic (Spitsbergen, Svalbard). *Zoologischer*

Anzeiger 252 (2013), 34–40.

Čkrkić, J., Petrović, A., Kosić, K., Ye, Zhengpei, Vollhardt, I.M.G., Hebert, P.D.N., Traugott, M. & Tomanović, Ž. 2019. Hidden in plain sight: phylogeography of an overlooked parasitoid species Trioxys sunnysidensis Fulbright & Pike (Hymenoptera: Braconidae: Aphidiinae). *Agricultural and Forest Entomology* 21: 299-308. https://doi.org/10.1111/afe.12332

Davidian, E.M. & Humala, A.E. 2023. Review of the Aphidiinae (Hymenoptera: Braconidae) fauna of the European North of Russia. *Russian Entomological Journal* 32, 297–304.

Edland, T. 1976. Verknad av insektmiddel i ulike konsentrasjoner på bladlus og nyttedyr. *Forskning og forsøk i landbruket* 27, 683–699.

Endrestøl, A. 2021. Strand-systemet 4.0. *Insekt-Nytt* 46 (1), 43–72.

FinBIF 2024. Finnish Biodiversity Info Facility. https://laji.fi/en. Accessed 19.9.2024

Folmer O., Black M., Hoeh W., Lutz R., & Vrijenhoek R. 1994. DNA primers for amplification of mitochondrial cytochrome coxidase subunit I from diverse metazoan invertebrates. *Molecular Marine Biology and Biotechnology* 1994 Oct;3(5):294-9. PMID: 7881515.

Fulbright, J.L. & Pike, K.S. 2007. A new species of *Trioxys* (Hymenoptera: Braconidae: Aphidiinae) parasitic on the bird cherry-oat aphid, *Rhopalosiphum padi* (L.) (Hemiptera: Aphididae) in the Pacific Northwest. *Proceedings of the Entomological Society of Washington* 109, 541–546.

Hall, T.A. 1999. BioEdit: a user-friendly biological sequence alignment editor and analysis program for Windows 95/98/NT. *Nucleic Acids Symposium Series* 41, 95–98.

Hellén, W. 1963. Die Alloxystinen Finnlands (Hymenoptera: Cynipidae). *Fauna Fennica* 15, 1–23.

Hellén, W. 1966. Cynipiden- und Proctotrupoidenfunde aus Norwegen (Hymenoptera). *Norsk Entomologisk Tidsskrift* 13, 393.

Hofsvang, T. & Hågvar, E.B. (1983) Primary parasitoids (Hym., Aphidiidae) and hyperparasitoids on aphids from Norway. *Fauna norvegica Serie B* 30, 60–62.(20129

Kim, S., Tomanović, Z., Yu, Y., Sohn, J., Han, Y., Lee, G. & Kim, J. 2021. Three new species of the genus Aphidius (Hymenoptera, Braconidae, Aphidiinae) from South Korea. *Journal of Hymenoptera Research* 86, 63–77.

Kocić, K., Mjøs, A.T., Čkrkic, J., Petrović, A., Popović, N., Paulsen, E.S., & Tomanović, Ž. 2024. Uncovering Norway: Descriptions of four new Aphidiinae species (Hymenoptera, Braconidae) with identification key and notes on phylogenetic relationships of the subgenus *Fovephedrus* Chen. *Insects* 2024, *15*(7), 518 https://doi.org/10.3390/insects15070518

Mackauer, M. & Starý, P. 1967. *Hym. Ichneumonoidea. World Aphidiinae*. Index of Entomophagous Insects. Le Francois. Paris. 195 pp.

Mackauer, M. 1968. Die Aphidiiden (Hymenoptera) Finnlands. *Fauna Fennica* 22, 1–40.

Rakhshani, E., Tomanović, Ž., Starý, P., Kavallieratos, N. G., Ilić, M., Stanković, S. S. & Rajabi-Mazhar, N. 2011. Aphidiinae parasitoids (Hymenoptera: Braconidae) of Macrosiphoniella aphids (Hemiptera: Aphididae) in the western Palaearctic region. *Journal of Natural History* 45 (41–42), 2559–2575.

Riedel, M. & Hansen, L.O. 2014. Braconidae (Hymenoptera) of Norway, Part II. *Norwegian Journal of Entomology* 61, 147–159.

SLU Artdatabanken (2024). Dyntaxa - svensk taxonomisk databas [Dataset]. https://metadata.artfakta.se/taxonomiskdata [15.XI.2024]

Starý, P. 1959. Notes on *Aphidius ephippium* Haliday (Hymenoptera: Braconidae: Aphidiinae). *Beiträge zur Entomologie* 9, 180–184.

Starý, P. 1981. Biosystematic synopsis of parasitoids on cereal aphids in the western Palaearctic (Hymenoptera, Aphidiidae; Homoptera, Aphidoidea). *Acta Entomologica Bohemoslovaca* 78, 382–396.

Strand, A. 1943. Inndeling av Norge til bruk ved faunistiske oppgaver. Norsk Entomologisk Tidsskrift 6: 207–224.

Talebi, A.A., Rakhshani, E., Starý, P., Tomanović, Ž. & Rajabi-Mazhar, N. 2009. Aphids and their parasitoids (Hym., Braconidae, Aphidiinae) associated with medicinal plants in Iran. *American-Eurasian Journal of Sustainable Agriculture* 3, 205–219.

Tomanović, Ž., Mitrović M., Petrović, A., Kavallieratos, N.G., Žikić, V., Ivanović, A., Rakhshani, E., Stary, P. & Vorburger, C. 2018. Revision of the European *Lysiphlebus* species (Hymenoptera: Braconidae: Aphidiinae) on the basis of COI and 28SD2 molecular markers and morphology. *Arthropod Systematics and Phylogeny* 76, 179–213.

Tomanović, Ž., Žikić, V. & Petrović, A. 2021. Fauna of parasitoid wasps (Hymenoptera, Braconidae, Aphidiinae) of Serbia. Serbian Academy of Sciences and Arts, Monographs, Book 15, 262 pp.

(in Serbian)
Westrum K., Klingen I., Hofsvang T. & Hågvar E.B. 2010 Checklist of primary parasitoidsand hyperparasitoids (Hymenoptera, Apocrita) on aphids (Hemiptera, Aphididae) from Norway. *Norwegian Journal of Entomology* 57, 142–153.
Yu, D., van Achterberg, C. & Horstmann, K. 2016. Taxapad 2016 – World Ichneumonoidea 2015. Taxonomy, Biology, Morthology and Distribution. On USB Flash drive. Nepean, Ontario, Canada.

Received: 25 October 2024
Accepted: 9 November 2024