

Contribution towards the knowledge of Norwegian Mesochorinae (Hymenoptera, Ichneumonidae), with description of a new species

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In this study, distributional records of 84 Norwegian species of the subfamily Mesochorinae are given. 4 species of the genus *Astiphromma* Förster, 1869 and 39 species of *Mesochorus* Gravenhorst, 1829 are newly reported from Norway, bringing the number of known Norwegian Mesochorinae up to 92. One species, *Astiphromma brevitarsis* **sp. n.** is described as new for science. For *Mesochorus jenensis* Schwenke, 2002, the unknown male is described and illustrated.

Key words: Mesochorinae, new species, *Mesochorus*, *Astiphromma*, Norway.

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Introduction

The subfamily Mesochorinae is a moderately large group of Ichneumonidae containing almost 900 described species worldwide, about 90% of them belonging to the cosmopolitan genus *Mesochorus* Gravenhorst (Yu *et al.* 2016). The species of Mesochorinae are probably all obligate hyperparasitoids, though some authors mentioned a few (questionable) cases of primary parasitism (Broad *et al.* 2018).

The European members of the subfamily Mesochorinae have been revised by Schwenke (1999, 2002, 2004) who described a large number of new taxa, but his descriptions are very short and often not useful for an unequivocal determination of the species (Riedel 2019). Horstmann (2006) and Vikberg & Vårdal (2017) have corrected some taxonomical mistakes and inconsistencies and described a few number of new taxa. Additional informations to the *Mesochorus* species which

were described by Schwenke and descriptions of some new European *Mesochorus* were recently published by Riedel (2018a, 2018b, 2019, 2020). The West Palaearctic species of the genus *Astiphromma* Förster were revised by Riedel (2015).

Actually, 355 species of Mesochorinae are known from Europe, but only 49 species have been reported from Norway so far (Yu *et al.* 2016). In the last years, we could accumulate material of Norwegian Mesochorines from several collection sites and collectors (see appendix) and add many new reports for Norway here.

Material and methods

The mentioned material was collected in Malaise traps, light traps or by sweep netting, usually in the Southern, Southeastern and Southwestern parts of Norway. The determinations were made by the

first author, a part of *Astiphromma* material also by the second author. The distributional records given below were taken from the catalogue of Yu *et al.* (2016), but only the Scandinavian countries were mentioned. The collection sites and names of collectors are compiled in the appendix below. The material is deposited in the private collections of both authors, the holotype of *Astiphromma brevitarsis* nov.sp. in the Zoologische Staatssammlung Munich/Germany (ZSM).

For the descriptions, morphological terms follow Broad *et al.* (2018). For the measurements the following relations were used: Length of 1st flagellomere (without anellus) was measured in lateral view; length of temple and eye was measured from dorsal view and length and width of hind femur and ovipositor sheath in lateral view. For the punctures of body parts the following definitions were used: scattered - distance 1–2x their diameter; dense - diameter of punctures larger than their distance.

For the measurements below, an Olympus SZX 7 stereo microscope with dividing eyepiece was used. The figures were taken with an Olympus SC 30 CCD-camera using the AnalySIS getIT and Helicon Focus Pro softwares and processed with the Microsoft Office Picture manager.

List of species

For detailed informations of collection sites see Appendix.

Genus *Astiphromma* Förster, 1869

Astiphromma aggressor (Fabricius, 1804)

Material: Mølstre: 1♀ May 2019, 1♀ July 2016, 3♀♀ July 2019, 1♀ August 2019, 1♀ September 2019; Finnvik: 1♀ August 2016, 2♀♀ July 2017, 2♀♀ August 2017, 1♀ June 2018, 7♀♀ June 2019, 2♀♀ July 2019, 1♀ June 2020; Oppsalsneset: 1♀ June 2017, 1♀ August 2016, 2♀♀ August 2018, 1♀ June 2020; Kjetså: 1♀ 29 July - 16 September 2019; Ognasanden: 1♀ 2–14 June 2019; Sandbekk: 1♀ 25 May–29 June 2019; Vikaneset 1: 8♀♀ 7–20 June 2019; Vikaneset 2: 2♀♀ 7–20 June 2019.

Distribution: Europe; known from Norway

(Roman 1936, Riedel 2015).

Astiphromma albitarse (Brischke, 1880)

Material: Skår: 1♀ 24 June 2020; Vikaneset 1: 1♀ 5♂♂ 12–26 May 2019, 3♀♀ 7–20 June 2019; Indraberget: 1♀ 10 June–7 July 2019.

Distribution: Europe; known from Finland and Sweden, new record for Norway.

Astiphromma anale (Holmgren, 1860)

Material: Skår: 1♂ May 2017, 1♂ May 2018; Finnvik: 1♀ May 2017, 1♂ June 2013 1♀ June 2019, 1♀ June 2020; Oppsalsneset: 3♀♀ May 2019; Skjærhalden: 3♀♀ 4 June 2010, 1♀ 14 July -15 August 2010; Kutjern: 1♀ July 2013, 1♀ May 2014; Bøensætra: 1♂ 5 May 1994; Lindtjern: 1♂ May 2012, 1♀ 1–21 June 2012; Gaupstein: 2♀♀ 7 June–9 August 2014; Vikaneset 1: 1♀ 7–20 June 2019.

Distribution: Europe; known from Finland, Sweden and Norway (Riedel & Hansen 2000, Riedel 2015).

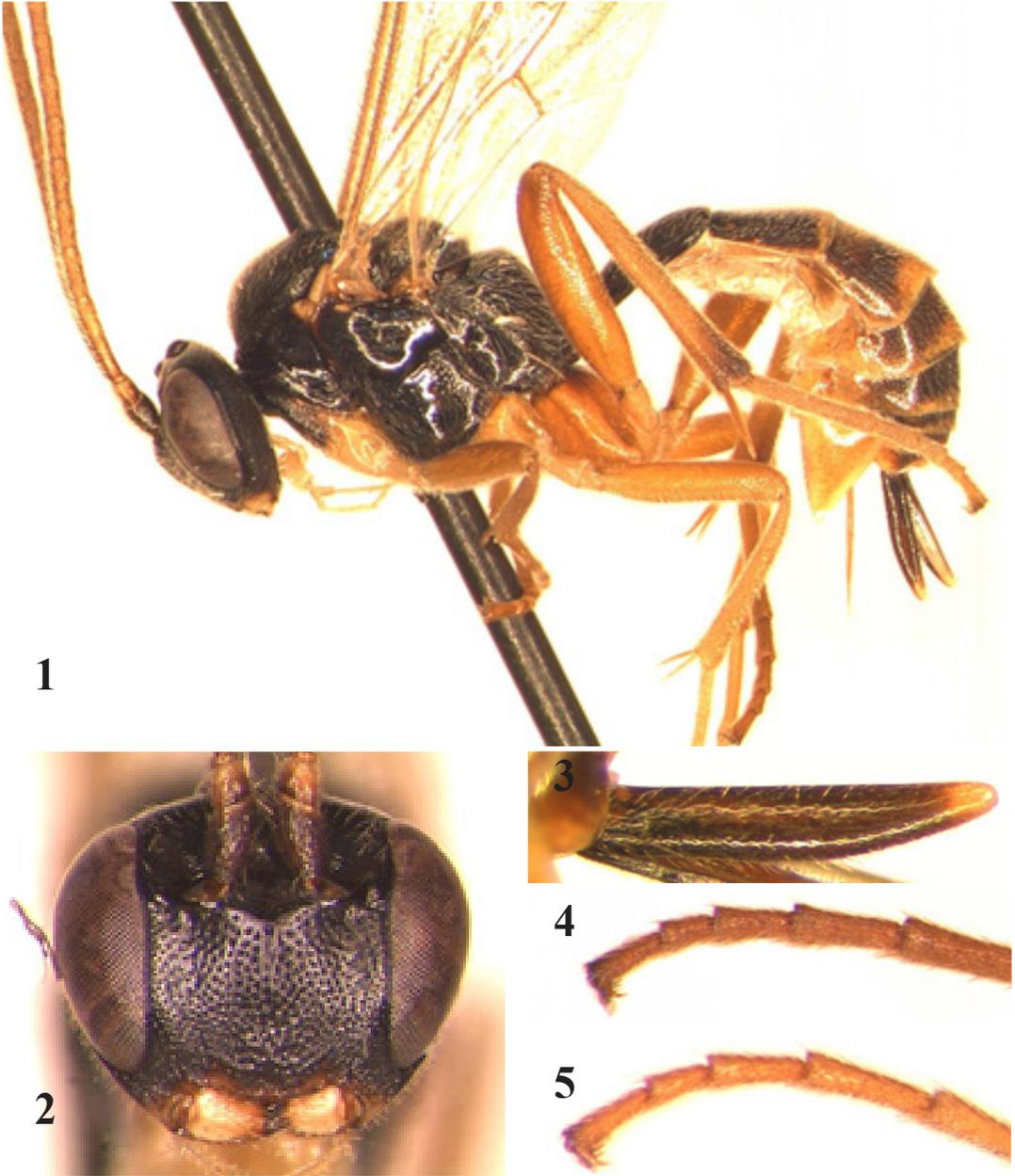
Astiphromma brevitarsis sp. n. (Figures 1–4)

Holotype: ♀ “Norway, EIS 22, HOY, Sveio, Mølstre May 2016 (Malaise), leg. Haraldseide, Håkon” (ZSM).

Paratypes: ♀ “Norway, EIS 14, RY, Suldal, Finnvik May 2018 (Malaise), leg. Haraldseide, Håkon”; 3♀♀ “Norway, EIS 14, RY, Suldal, Finnvik June 2019 (Malaise), leg. Haraldseide, Håkon”; ♀ “Norway, EIS 14, RY, Suldal, Finnvik June 2020 (Malaise), leg. Haraldseide, Håkon”; ♀ “Norway, EIS 14, RY, Suldal, Finnvik July 2018 (Malaise), leg. Haraldseide, Håkon” (all coll. Haraldseide), ♀ “Norway, EIS 14, RY, Suldal, Finnvik June 2018 (Malaise), leg. Haraldseide, Håkon” (coll. Riedel).

Etymology: The name of the new species refers to its short hind tarsomeres.

Description: ♀: Body length 5.0–5.5 mm. Flagellum with 33–35 flagellomeres; 1st flagellomere 5.3× longer than wide and 0.65× as long as eye; 2nd flagellomere 3.2× longer than wide; preapical one 1.5–2× longer than wide. Temple strongly narrowed behind eye, seen from dorsal 0.5× as long as eye. Distance of lateral ocellus to eye 1.6× ocellar diameter. Face with



FIGURES 1–5. Holotype of *Astiphromma brevitarsis* sp. n. 1. Lateral habitus. 2. Face from frontal. 3. Ovipositor sheath. 4. Hind leg. 5. Hind leg of *Astiphromma uliginosum* Schwenke, 1999.

parallel sides, width 1.10–1.15× combined length of clypeus and face and 0.88–0.92× eye length, densely punctate and granulate. Clypeus granulate, with rather dense punctures. Mandibular teeth equally sized. Malar space 0.7–0.8× as long as width of mandibular base. Genal carina reaching

hypostomal carina far from mandibular base; hypostomal carina low.

Ventral parts of mesopleuron with scattered fine setiferous punctures. Scutellum slightly convex, not carinate laterally. Area basalis c. 1.5× longer than wide, sometimes confluent with area

superomedia. Area superomedia 2.2× longer than wide, lateral carinae sometimes weak in caudal half; anterior transverse carina in or shortly frontal to its middle. Area petiolaris as long as wide. Hind femur 4.5–4.7× longer than wide. Hind claw with three long strong teeth. Hind tarsus stout, 2nd hind tarsomere 2.5–3.0× longer than wide; 3rd hind tarsomere 1.7–2.2× longer than wide; 4th hind tarsomere 1.4–1.9× longer than wide. Areolet shortly stalked; vein 2m-cu in or proximal to its middle. Vein 1cu-a strongly postfurcal (by 0.6× its length). Pterostigma 3.7× longer than wide; anterior margin of radial cell c. 1.1× longer than pterostigma.

1st tergite 2.1× longer than wide; postpetiolus 1.1× longer than wide, with distinct dorsolateral carina, otherwise smooth. 2nd tergite 0.7× as long as wide; thyridium rounded or kidney-shaped. Ovipositor sheath pilose, 5.3–5.5× longer than wide and 0.95× as long as hind metatarsus, ventrally narrowed in its apical 0.4.

Color: Black. Face and clypeus completely black, malar space usually yellowish at mandibular base; mandible except teeth yellowish. Scape black; flagellum reddish-brownish, apically darker. Hind edge of pronotum, tegula, and fore and middle coxae and trochanters yellow. Metasoma black; 2nd tergite with yellowish-red triangular spot in apical 0.25; 3rd and 4th tergites (rarely also 5th tergite) yellowish-red, black laterally; following tergites black with narrow yellowish hind margins. Ovipositor sheath blackish. Legs reddish-yellow; rarely hind coxa with brown spots; hind femur slightly darkened apically; hind tibia yellow, infusate in apical 0.2; hind tarsus brownish. Pterostigma ochreous. Male unknown.

Remark: This new species is closely related to *Astiphromma uliginosum* Schwenke and runs to that taxon in the key of *Astiphromma* (Riedel, 2015). It differs mainly by a stouter ovipositor sheath and stout hind tarsomeres (figures 4 and 5).

Distribution: Only known from Norway.

Astiphromma dorsale (Holmgren, 1860)

Material: Smedalsvatn: 2♂♂ 31 July 2010; Mølstre: 5♂♂ June 2014, 1♀ May 2016; Rekedal: 1♀1♂ 2018; Vikaneset 1: 2♀♀ 7–20 June 2019,

1♀ 20 June–10 July 2019; Vikaneset 2: 2♀♀ 7–20 June 2019.

Distribution: Palaearctic and Oriental; known from Norway (Riedel *et al.* 2010, Riedel 2015).

Astiphromma rimosum Schwenke, 1999

Material: Myrvold: 1♀ 16 May 2016; Tomter: 1♀ 18 May–7 June 2010.

Distribution: Europe; known from Finland, Sweden and Norway (Riedel 2015).

Astiphromma splenium (Curtis, 1833)

Material: Finnvik: 1♂ August 2013, 1♀ August 2015, 1♂ May 2016, 1♀ June 2016, 1♀ August 2016, 1♀ September 2016; Mølstre: 1♀2♂♂ May 2014, 2♀♀1♂ June 2014, 1♂ July 2014, 1♀ September 2016; Skår: 1♀1♂ August 2015, 1♀1♂ May 2016, 10♀♀1♂ June 2016, 1♀ August 2016, 1♀ September 2016; Råkil: 1♀ 10 June 1999, 1♀ 18 June–27 August 2014; Alby: 1♀ 13 July 1997; Lindtjern: 1♀ 5 July–9 August 2012; Lærdal: 1♂ 31 July 2010; Rekedal: 1♂ 2018; Kjetså: 1♀ 29 July–16 September 2019; Vikaneset 1: 2♀♀ 20 June–10 July 2019; Vikaneset 2: 1♀ 20 June–10 July 2019, 5♀♀ 7–20 June 2019; Indrabergset: 1♂ 20 May–9 June 2019, 1♀1♂ 10 June–7 July 2019; Skittmyr: 2♀♀ 7 September–27 October 2019.

var. *sachalinense* Uchida, 1933

Material: Skår: 1♀ 14–27 June 2015; Finnvik: 1♀ June–July 2017; Buviken: 1♀ 18 August–8 October 2016.

Remark: The females from Finnvik and Buviken have largely black hind coxae and apically black hind femora; the female from Finnvik has an almost completely blackish metasoma with some reddish suffusion on the hind margins of 2nd to 4th tergites (as in var. *sericans*). The coloration of hind legs resembles the var. *sachalinense* Uchida, 1933 which is commonly found in Russia Far East (Riedel & Kasparyan 2018), but was not reported from the West Palaearctic region before.

Distribution: Holarctic; known from Finland, Sweden and Norway (Riedel 2015).

Astiphromma striatum (Brischke, 1880)

Material: Holleby: 1♀ 20–30 July 2015.

Distribution: Palaearctic; known from Finland and Sweden, new record for Norway.

***Astiphromma tenuicorne* (Thomson, 1886)**

Material: Mølstre: 1♀ July 2014, 1♀ July 2016, 1♀ July 2019; Skår: 1♀ July 2016, 1♀ July 2017; Oppsalsneset: 2♀♀ June 2018, 1♀ August 2017, 1♀ August 2018; Rekvei: 1♀ 7 September 2019.

Distribution: Europe; known from Finland, Sweden and Norway (Riedel & Hansen 2000, Riedel 2015).

***Astiphromma tridentatum* Schwenke, 1999**

Material: Skår: 1♀ July 2015; Finnvik: 1♀ May 2017; Mølstre: 1♀ July 2019.

Distribution: Palaearctic; known from Sweden (Riedel 2015), new record for Norway.

***Astiphromma uliginosum* Schwenke, 1999**

(Figure 5)

Material: Skittmyr: 5♀♀ 7 September–27 October 2019.

Distribution: Europe; known from Norway (Riedel & Hansen 2012, Riedel 2015).

***Astiphromma varipes* (Holmgren, 1860)**

Material: Finnvik: 1♂ June 2016.

Distribution: West Palaearctic; known from Norway (Riedel & Hansen 2012, Riedel 2015).

Genus *Mesochorus* Gravenhorst, 1829

***Mesochorus albifacies* Riedel, 2020**

Material: Finnvik: 1♂ June 2019.

Distribution: Known from Sweden, new record for Norway.

***Mesochorus alpigenus* Strobl, 1904**

Material: Ognasanden: 1♀ 14 June–2 July 2019.

Distribution: Europe; known from Finland, Sweden and Norway (Jussila 2011).

***Mesochorus angustatus* Thomson, 1886**

Material: Mølstre: 1♀ June 2019.

Distribution: West Palaearctic; known from Finland and Sweden, new record for Norway.

***Mesochorus anomalus* Holmgren, 1860**

Material: Finnvik: 1♀ August 2014, 1♀ August 2017, 1♀ August 2019.

Distribution: Europe; known from Finland, Sweden and Norway (Jussila 1976).

***Mesochorus atriventris* Cresson, 1872**

syn. *Mesochorus sylvarum* auct. non Curtis

Material: Mølstre: 11♀♀ June 2014, 3♀♀ July 2014, 1♀ August 2014, 1♀ June 2016, 1♀ June 2017, 1♀ July 2017, 3♀♀ June 2019, 2♀♀ July 2019; Skår: 2♀♀ September 2015, 1♀ October 2015, 2♀♀1♂ June 2016, 3♀♀ July 2016, 4♀♀ August 2016, 1♀ September 2016, 1♀ July 2017, 1♀ August 2017, 1♀1♂ September 2017, 1♂ May 2018; Finnvik: 1♀ July 2013, 1♀ August 2013, 1♀ June 2016, 3♀♀ August 2016, 1♀ September–October 2016, 2♀♀ June–July 2017, 1♀ August 2017, 3♀♀ June 2018, 1♀ August 2019; Oppsalsneset: 2♀♀ June 2017, 1♀ August 2017, 3♀ June 2018; Munkebråten: 1♀ August 2011; Gaupstein: 1♀ 22 May–18 August 2013; Hosanger 1: 1♀ 18 May–18 June 2019; Vikaneset: 1♀ 20 June–10 July 2019; Indraberget: 1♀ 21 September–16 November 2019.

Distribution: Holarctic; known from Finland, Sweden and Norway (Strand 1906 and Roman 1936 as *sylvarum*).

***Mesochorus bicinctus* Schwenke, 1999**

Material: Brusand S: 1♂ 2–17 July 2019.

Distribution: Europe; known from Norway (Riedel & Hansen 2012).

***Mesochorus bicolor* Schwenke, 1999**

Material: Talge: 1♀ 8 May–9 June 2019, 1♀ 9 July–10 August 2019; Skittmyr: 1♀ 7 September–27 October 2019; Mølstre: 1♀ July 2014, 1♀ July 2016, 1♀ August 2016.

Distribution: Europe; known from Sweden, new record for Norway.

***Mesochorus boreomontanus* Schwenke, 1999**

Material: Skår: 2♀♀ 1–7 July 2015, 1♀ September 2015, 2♀♀ August 2018; Oppsalsneset: 1♀ August 2018; Hosanger 1: 1♀ 14 September–2 November 2019; Mølstre: 1♀ September, 2019; Buviken: 1♀ 18 August–8 October 2016;

Revtangen 2: 1♂ 1 August 2012.

Distribution: Europe; known from Finland, new record for Norway.

***Mesochorus britannicus* Schwenke, 1999**

Material: Finnvik: 1♀ September 2016, 1♂ October 2017, 1♀ July 2018, 4♀♀ August 2018; Mølstre: 1♀ September 2016; Oppsalsneset: 2♀♀ August 2018; Hosanger 2: 1♀ 12 August 2012; Revtangen 2: 1♂ 4 August 2014; Revtangen 1: 1♀ 26 September 2019; Vikaneset 2: 1♀ 8 September–3 October 2019.

Distribution: West Palaearctic; known from Norway (Riedel 2018a).

***Mesochorus callis* Schwenke, 1999**

Material: Mølstre: 2♀♀ June 2016, 1♀ June 2017, 1♀ May 2019, 1♀ June 2019, 1♀ July 2019; Skår: 1♀ June 2016.

Distribution: Known from the Alps, new record for Norway and Scandinavia.

***Mesochorus campestris* Schwenke, 1999**

Material: Finnvik: 1♀ July 2016.

Short diagnosis: Body length 3 mm. Flagellum with 29 flagellomeres. Distance between lateral ocellus and eye $1.0\times$ ocellar diameter. Mesopleuron smooth. Area superomedia rhombic, $2\times$ longer than wide and $1.2\times$ longer than area petiolaris; anterior transverse carina in frontal 0.4 . Area petiolaris c. $1.1\times$ longer than wide. Hind femur $3.8\times$ longer than wide. Ovipositor sheath $3.1\times$ longer than wide. Color: Mesosoma black; hind edge of pronotum, tegula and wing base yellowish. Hind tibia pale yellow, blackish basally and in apical 0.1 ($0.5\times$ tibial width).

Remark: Several species described by Schwenke (1999) in his *sylvarum*-group of *Mesochorus* were separated mainly by their different size, but do not show distinct morphological differences in our experience. Their correct state as separable taxa or probable variants of *Mesochorus atriventris* Cresson remain unclear to date. Therefore, *Mesochorus campestris* Schwenke might be a new synonym of *M. atriventris* Cresson. A closer study of the European material with more molecular data will be necessary to clarify this taxonomical question.

Distribution: Known from Poland, new record for Norway and Scandinavia.

***Mesochorus cimbicis* Ratzeburg, 1844**

Material: Finnvik: 1♀ September–October 2016.

Distribution: Palaearctic and Oriental; known from Norway (Jussila 1973).

***Mesochorus crassimanus* Holmgren, 1860**

Material: Revtangen 1: 1♀ 6 August 2019, Mølstre: 1♀ September 2019.

Distribution: Europe; known from Finland and Sweden, new record for Norway.

***Mesochorus curvulus* Thomson, 1886**

Material: Mølstre: 7♀♀ June 2014, 5♀♀ July 2014, 1♂ July 2019; Finnvik: 1♀ July 2016, 1♀ June–July 2017, 2♀♀ July 2019; Skår: 2♀♀ July 2016, 1♀ June 2017, 1♀ August 2017; Oppsalsneset: 1♀ July 2018; Rekvei: 1♀ March–October 2018.

Distribution: Holarctic; known from Finland, Sweden and Norway (Jussila 1973)

***Mesochorus dimidiator* Aubert, 1970**

Material: Skår: 1♀ August 2015, 1♀ July 2016, 1♀ July 2017; Mølstre: 1♂ June 2014, 1♀ June 2016; Finnvik: 1♀ September 2016.

Distribution: Palaearctic; known from Sweden, new record for Norway.

***Mesochorus discitergus* (Say, 1836)**

Material: Sandbakken: 1♂ 9 September 2000.

Distribution: Almost worldwide; known from Denmark, Finland and Sweden, new record for Norway.

***Mesochorus dispar* Brischke, 1880**

Material: Mølstre: 2♀♀ July 2014, 1♀ August 2014; Skår: 1♀ August 2016.

Distribution: Europe; known from Denmark and Finland, new record for Norway.

***Mesochorus doleri* Schwenke, 1999**

Material: Mølstre: 1♀ July 2014.

Remark: In contrast to the original description of Schwenke (1999: 93), the ovipositor sheath

is slightly shorter (0.99–0.95×) than the hind metatarsus (Riedel 2019).

Distribution: Known from Germany and Poland; new record for Norway and Scandinavia.

***Mesochorus dumosus* Schwenke, 1999**

Material: Mølstre: 1♀ May 2019, 1♀ August 2019.

Distribution: Known from Sweden, new record for Norway.

***Mesochorus errabundus* Hartig, 1838**

Material: Finnvik: 1♀ August 2019.

Distribution: Europe; known from Norway (Riedel & Hansen 2015).

***Mesochorus fennicus* Schwenke, 1999**

Material: Revtangen 1: 1♀ 6 August 2019.

Distribution: Known from Finland and Sweden (Riedel 2020), new record for Norway.

***Mesochorus flexus* Schwenke, 1999**

Material: Oppsalsneset: 1♀ July 2018.

Distribution: Europe; known from Finland and Sweden, new record for Norway.

***Mesochorus frondosus* Schwenke, 1999**

Material: Finnvik: 2♀♀ July 2019, 1♀ August 2019; Skår: 3♀♀ June 2016; Talgje: 1♀ 9 June–9 July 2019; Vikaneset 1: 1♀ 28 July–16 August 2019; Rekvei: 1♀ 7 September 2019; Åstad: 1♀ 7 September 2019.

Distribution: Known from Germany and Sweden (Riedel 2020), new record for Norway.

***Mesochorus fulgurans* Curtis, 1833**

syn. *Mesochorus fulvus* Thomson, 1886

Material: Mølstre: 1♀ August 2017, 1♀ August 2019; Skår: 1♀ 13–20 June 2015, 2♀♀ 1–7 July 2015, 7♀♀ July 2015, 2♀♀ June 2016, 3♀♀ July 2016, 2♀♀ August 2016, 3♀♀ June 2017, 2♀♀ August 2017, 1♀ September 2017, 2♀♀ June 2018; Finnvik: 1♀ July 2016, 1♀ August 2016, 1♀ July 2017, 1♀ September 2017, 3♀♀ August 2018; Gaupstein: 1♀ August 2014; Råkil: 1♂ 10 May 2011, 1♀ 15 July 1998; Skjeberg: 1♀ 1 July 2003; Myrvold: 1♀ 21 September 2017; Revtangen 2: 1♀ 25 September

2017, 1♀ 14 August 2018, 1♀ 4 September 2018, 1♀ 5 September 2018; Rekedal: 1♀ 2018; Hosanger 1: 1♀ 13 July–9 August 2019, 1♀ 9 August–14 September 2019; Kjetså: 1♀ 29 July–16 September 2019; Njåskogen: 1♀ 1–18 June 2019; Indraberget: 1♀ 10 June–7 July 2019.

Distribution: Palearctic and Oriental; known from Norway (Strand 1913, Roman 1942 and Jussila 1973 as *fulvus*, Riedel 2018a).

***Mesochorus fulgurator* Horstmann, 2006**

Material: Mølstre: 1♀ June 2014, 1♀ August 2014; Finnvik: 1♂ June 2018, 1♀ July 2019; Skjeberg: 1♀ 3 July 2003.

Distribution: Europe; known from Finland and Sweden, new record for Norway.

***Mesochorus gemellus* Holmgren, 1860**

Material: Rokke: 1♀ 25 June 2002.

Distribution: Europe; known from Finland, Sweden and Norway (Riedel & Hansen 2005).

***Mesochorus giberius* (Thunberg, 1822)**

syn. *Mesochorus temporalis* Thomson, 1886, synonymized by Riedel & Kolarov 2020

Material: Holleby: 1♀ 25 August 2015; Flesjøvannet: 1♀ 3 July 1996.

Remark: The Norwegian reports of *Mesochorus giberius* auct. (Strand 1906, Roman 1936 and Riedel & Hansen 2005) are misidentifications of *Mesochorus marginatus* Thomson.

Distribution: Palearctic; known from Finland and Sweden, new record for Norway.

***Mesochorus globulator* (Thunberg, 1824)**

Material: Kutjern: 1♀ 23 June–21 July 2013; Opsalneset: 1♀ July 2017; Finnvik: 1♀ July 2017, 1♀ June 2019; Mølstre: 1♀ July 2014.

Distribution: Holarctic; known from Norway (Riedel *et al.* 2004).

***Mesochorus heterodon* Horstmann, 2006**

Material: Nord i Fjella: 1♀1♂ 15 July 2015.

Distribution: Europe; known from Norway (Riedel 2018a).

***Mesochorus hortensis* Schwenke, 1999**

Material: Mølstre: 2♀♀ August 2016, 4♀♀ September 2016.

Distribution: Europe; new record for Norway.

***Mesochorus iburganus* Schwenke, 1999**

Material: Mølstre: 1♀ August 2019.

Distribution: Known from Germany, new record for Norway and Scandinavia.

***Mesochorus jenensis* Schwenke, 2002**

new ♂ (Figures 6–9)

Material: Presthammar: 1♂ August 2017.

Description: Body length 6 mm. Flagellum with 36 flagellomeres; 1st flagellomere c. 5.5× longer than wide and 0.7× as long as eye, 2nd flagellomere 4.0× longer than wide, preapical flagellomere 2.7× longer than wide. Temple moderately and roundly narrowed behind eye, dorsally c. 0.6× as long as eye. Ocelli large, distance of lateral ocellus to eye 0.7× ocellar diameter. Face width 1.0× combined length of face and clypeus and 0.8× eye length, punctate, with parallel sides. Mandible with two equally sized teeth. Malar space striate, 0.2× as long as width of mandibular base. Mesopleuron with scattered fine punctures ventrally. Area basalis triangular, stalked posteriorly. Area superomedia 2.6× longer than wide and 1.7× longer than area petiolaris; anterior transverse carina in its frontal 0.3. Area petiolaris 0.7× as long as wide. Hind femur slender, 5.7× longer than wide; hind metatarsus 0.54× as long as hind tibia; hind claw with 3 long basal teeth. 1st tergite 2.8× longer than wide, postpetiolus smooth. 2nd tergite c. 1.25× longer than wide; thyridium rounded. Stylet of paramere stick-shaped, not clubbed apically, c. 1.3× longer than 2nd hind tarsomere.

Color: Reddish-yellow. Antenna, palps, mandible except teeth, clypeus, gena, face and wide orbits cream-yellow. medially, stemmaticum and occiput ochreous. Mesosoma yellowish; side of pronotum, tegula and subtegular ridge cream-yellow; anteromedian spot of mesoscutum brown; propodeum with some ochreous suffusion. 1st tergite brownish; 2nd tergite brownish, with cream-yellow hind margin; 3rd tergite cream-yellow, with ochreous sides, following tergites yellowish-red.

Legs cream-yellow; hind tibia narrowly red at apex (0.5x tibial width). Pterostigma hyaline.

Remark: This species belongs to the *orbitalis*-group of *Mesochorus* (sensu Schwenke 1999). The new male runs to *Mesochorus zygaenae* Schwenke in his key of males of the *orbitalis*-group. It differs from that species by its cream yellow face, paler mesosoma and only slightly infuscate apex of hind tibia. From the female of *Mesochorus jenensis* it mainly differs by the cream-yellow color pattern of pronotum and tegula.

Distribution: Only known from Germany, new record for Norway and Scandinavia.

***Mesochorus jugicola* Strobl, 1904**

Material: Hosanger 1: 3♀♀ 18 May - 18 June 2019, 2♀♀ 18 June–13 July 2019.

Remark: Hind coxa reddish, hind claw densely pectinate.

Distribution: Europe; new record for Norway and Scandinavia.

***Mesochorus lapponicus* Thomson, 1885**

Material: Kjetså: 1♀ 16 September–5 November 2019.

Distribution: Europe; known from Norway (Strand 1913).

***Mesochorus larentiae* Schwenke, 1999**

Material: Finnvik: 1♀ September 2016, 1♀ August 2017; Skår: 1♀ September 2016; 1♀ June 2017, 1♂ August 2017, 3♀♀ July 2018, 2♀♀ August 2018; Mølstre: 3♀♀ July 2014, 1♀ September 2019.

Distribution: Known from Central Europe and Sweden, new record for Norway.

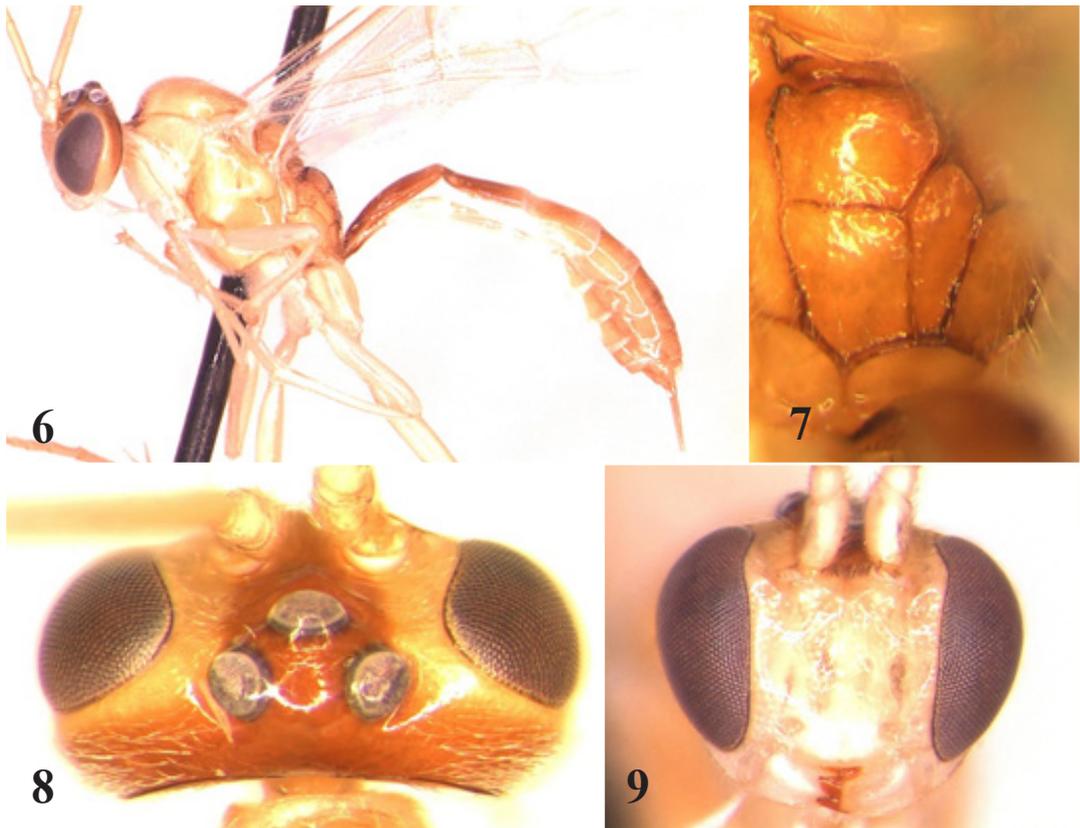
***Mesochorus laricis* Hartig, 1838**

Material: Finnvik: 1♀ August 2013, 1♀ September 2013, 1♀ September 2016; Myrvold: 1♀ 8 August 2016; Sokdal: 2♀♀ 7 September 2019.

Distribution: Europe; known from Finland, Sweden and Norway (Riedel 2018a).

***Mesochorus latus* Schwenke, 1999**

Material: Brusand S: 1♀ 16 June–2 July 2019, 1♀ 2–17 July 2019.



FIGURES 6–9. Male of *Mesochorus jenensis* Schwenke, 2002. 6. Lateral habitus. 7. Propodeum. 8. Head from dorsal. 9. Face.

Remark: Hind coxa reddish, not brown, otherwise typical.

Distribution: Known from United Kingdom and Sweden, new record for Norway.

***Mesochorus marginatus* Thomson, 1886**

syn. *Mesochorus giberius* auct. nec Thunberg

Material: Oppsalsneset: 1♀ June 2018.

Distribution: Palaearctic; known from Norway (Strand 1906, Roman 1936 and Riedel & Hansen 2005 as *giberius*).

***Mesochorus nigrofacies* Riedel, 2020**

Material: Ognasanden: 2♀ 1♂ 2–14 June 2019; Mølstre, 2♀ June 2016, 1♀ May 2019; Oppsalsneset: 2♀ June 2018; Rekvei: 1♀ March–October 2018.

Remark: The first author has recently separated this darker colored species from

Mesochorus curvulus Thomson which had been included in the species-concept of *M. curvulus* in the past (see Riedel 2020: 115–117).

Distribution: Known from Sweden and Norway (Riedel 2020).

***Mesochorus nuncupator* (Panzer, 1800)**

Material: Mølstre: 1♀ June 2016, 1♀ June 2017, 1♀ August 2019; Finnvik: 1♀ September 2015, 1♀ June 2016.

Distribution: Palaearctic; known from Finland, Sweden and Norway (Riedel & Hansen, 2015).

***Mesochorus olerum* Curtis, 1833**

syn. *Mesochorus pectoralis* Ratzburg, 1844

Material: Øra: 1♀ 24 July 1993.

Distribution: Palaearctic; known from Sweden, Iceland, Finland and Norway (Strand

1906, Strand 1913, Roman 1936 and Jussila 1976 as *pectoralis*).

***Mesochorus orbitalis* Holmgren, 1860**

Material: Finnvik: 1♀ September 2017.

Distribution: West Palaearctic; known from Finland, Sweden and Norway (Strand 1901, Roman 1936).

***Mesochorus owenae* Schwenke, 1999**

Material: Kjetså: 1♀ 29 July–16 September 2019.

Distribution: Known from United Kingdom; new report for Norway and Scandinavia.

***Mesochorus paracarinatus* Araujo & Vivallo, 2015**

syn. *Mesochorus carinatus* Schwenke, 1999, preoccupied by Dasch, 1974

Material: Mølstre: 3♀♀ June 2014, 3♀♀ September 2016, 1♀ June 2019, 1♀ July 2019; Finnvik: 1♀ July 2016, 1♀ September–October 2016, 3♀♀ September 2017, 1♀ October 2017, 1♀ September 2019; Skår: 1♀ October 2016, 1♀ August 2018; Opsalneset: 1♀ September 2016, 1♀ July 2017, 1♀ September 2017, 3♀♀ August 2018, 1♀ August–September 2018; Buerbakkene: 1♀ 18 July 2004.

Distribution: Known from Estonia, Finland, Sweden and United Kingdom, new record for Norway.

***Mesochorus pelvis* Schwenke, 2002**

Material: Mølstre: 1♀ June 2017; Hosanger 2: 1♀ 16 July 2018.

Distribution: West Palaearctic; known from Sweden, new record for Norway.

***Mesochorus perticatus* Schwenke, 1999**

Material: Mølstre: 2♀♀ June 2014, 1♀ May 2017; Oppsalsneset: 1♀ July 2007.

Distribution: Known from Germany and United Kingdom, new record for Norway.

***Mesochorus pictilis* Holmgren, 1860**

Material: Mølstre: 1♀ August 2014, 1♀ September 2019; Munkebråten: 1♀ August 2011; Kjetså: 1♀ 29 July–16 September 2019; Skittmyr:

3♀♀ 7 September–7 October 2019.

Distribution: Holarctic; known from Finland, Sweden and Norway (Riedel *et al.* 2000).

***Mesochorus politus* Gravenhorst, 1829**

Material: Finnvik: 1♀ August 2013, 2♀♀ July 2016, 1♀ June–July 2017, 2♀♀ July 2017; Skår: 1♀ June 2017; Rokke: 1♀ 18 August 2000; Rekvei: 1♀ 2018; Brusand S: 1♀ 16 June–2 July 2019; Kjetså: 1♀ 18 June–12 July 2019, 1♀ 13–27 July 2019, 1♀ 29 July–16 September 2019; Vikaneset 1: 1♀ 20 June–10 July 2019; Indrabergget: 4♀♀ 10 June–7 July 2019; Skittmyr: 1♀ 7 September–27 October 2019; Rekedal: 1♀ 25 July 2019.

Distribution: Palaearctic; known from Finland, Sweden and Norway (Jussila 1973).

***Mesochorus punctipleuris* Thomson, 1886**

Material: Finnvik: 2♀♀ September–October 2016, 3♀♀ July 2017, 1♀ August 2017, 1♀ October 2017; Opsalneset: 1♀ August 2016; Myrvold: 1♀ 8 August 2016; Rokke: 1♀ 2 August 2001; Buviken: 1♂ 18 August–8 October 2016.

Remark: Riedel & Hansen (2012) have reported *Mesochorus haeselbarthi* Schwenke, 1999 from Norway. This material belongs to *M. punctipleuris* Thomson. *M. haeselbarthi* has not been found in Norway so far.

Distribution: Holarctic; known from Norway (Jussila 1973, Riedel & Berg 1997, Riedel & Hansen 2012 as *haeselbarthi*).

***Mesochorus rufoniger* Brischke, 1880**

Material: Revtangen 1: 3♀♀ 10♂♂ 7 July–28 August 2019; Revtangen 2: 1♀ 28 May 2018, 1♀ 30 May 2018, 1♀ 31 May 2018, 1♀ 1♂ 1 June 2018; Brusand N: 3♀♀ 31 May–16 June 2019; Kjetså: 2♀♀ 18 June–12 July 2019; Sandbekk: 1♀ 25 May–29 June 2019; Mølstre: 1♀ July 2019, 1♀ August 2019; Brusand S: 2♀♀ 16 June–2 July 2019.

Distribution: Europe; known from Finland and Sweden, new record for Norway.

***Mesochorus salicis* Thomson, 1886**

Material: Skår: 2♀♀ July 2018.

Distribution: West Palaearctic; known from

Norway (Riedel & Hansen 2012).

***Mesochorus savoianus* Schwenke, 2004**

Material: Langoya: 1♀ 8 July 1991; Sandbakken: 1♀ 22 September 1998.

Remark: This species is closely related to *M. bavaricus* Schwenke and probably represents a color variant of that taxon. The available Norwegian females differ from the original description of *M. savoianus* (Schwenke 2004: 85) by: vein 1cu-a interstitial; pronotum blackish, but upper margins reddish, hind edges cream-yellow; mesosoma otherwise red; hind tibiae blackish in apical 0.2–0.3. One specimen has the 1st and 2nd tergites dark reddish.

Distribution: Known from France, new record for Norway and Scandinavia.

***Mesochorus semirufus* Holmgren 1860**

Material: Finnvik: 1♀ July 2014, 1♀ June 2016, 1♀ July 2016, 1♀ August 2016, 1♀ September–October 2016, 1♀ June–July 2017, 1♀ August 2017, multiple♀♀ May–August 2018, 3♀♀ June 2019, 6♀♀ July 2019, 1♀ August 2019; Mølstre: 3♀♀ July 2014, 2♀♀ August 2014, 3♀♀ July 2016, 2♀♀ July 2019, 1♀ August 2019, 1♀ September 2019; Skår: 2♀♀ August 2015, 5♀♀ June 2016, 1♀ July 2016, 2♀♀ August 2016, 1♀ May 2017, 4♀♀ August 2017, 1♀ September 2017, 1♀ May 2018, 5♀♀ July 2018, 1♀ August 2018; Oppsalsneset: 1♀ May 2017, 1♀ June 2017, 1♀ August/September 2017, 1♀ July 2018, 1♀ August 2018; Råkil: 2♀♀ 12 August 1994 and 12 June 1999; Gaupstein: 1♀ 22 May–18 August 2012, 1♀ 18 August–24 September 2013; Hosanger 2: 1♀1♂ 13 August 2012; Hosanger 1: 1♀ 13 July–9 August 2019, 2♀♀ 9 August–14 September 2019; Tomter: 1♀ 28 June 2010; Kjetså: 1♀ 15 May–18 June 2019, 1♀ 29 July–16 September 2019; Skittmyr: 4♀♀ 7 September–27 October 2019; Rekvei: 1♀ 7 September 2019; Revtingen 1: 1♀ 27 August 2019; Sandbekk: 1♀ 25 May–29 June 2019.

Distribution: Palaearctic and Oriental; known from Finland, Sweden and Norway (Riedel & Berg 1997).

***Mesochorus septentrionalis* Schwenke, 1999**

Material: Råkil: 1♀ 5 July 1995; Skjærhalden: 1♀ 4 June 2010.

Distribution: Known from Iceland and Sweden, new record for Norway.

***Mesochorus stigmator* (Thunberg, 1822)**

Material: Kjetså: 1♂ 18 June–12 July 2019.

Distribution: Europe; known from Denmark, Finland and Sweden, new record for Norway.

***Mesochorus sublimis* Schwenke, 1999**

Material: Bjerkebakke: 1♀ 5 July 2015.

Remark: The Norwegian specimen differs from the holotype by dark reddish sides of pronotum and dark reddish dorsal part of mesopleuron, but is otherwise typical.

Distribution: Known from the Alps, new record for Norway and Scandinavia, probably a boreomontane species.

***Mesochorus tachypus* Holmgren, 1860**

Material: Kjetså: 1♀ 16 September–5 November 2019.

Distribution: Holarctic; known from Finland and Sweden, new record for Norway.

***Mesochorus tenthredinidis* Schwenke, 1999**

Material: Mølstre: 1♀ July 2014, 1♀ August 2014, 1♀ July 2016, 1♀ June 2017; 2♀♀ July 2019; Finnvik: 1♀ July 2018, 1♀ June 2019.

Distribution: Europe; known from Finland, new record for Norway

***Mesochorus terebratus* Schwenke, 1999**

Material: Skår: 1♂ August 2015, 1♀ October 2016.

Distribution: Europe; known from Sweden, new record for Norway.

***Mesochorus testaceus* Gravenhorst, 1829**

Material: Skår: 1♀ August 2016, 1♀ July 2017, 1♀ August 2017; Mølstre: 3♀♀ July 2019, 1♀ August 2019; Tistel Gård: 1♀ 30 July 2010; Hosanger 1: 1♀ 18 May–18 June 2019; Rekvei: 1♀ 7 September 2019; Skittmyr: 2♀♀ 7 September–27 October 2019; Revtingen 1: 1♀ 24 August 2019.

Remark: The coloration of mesopleuron is variable: from black to ± reddish.

Distribution: Palaearctic; known from Norway (Riedel *et al.* 2000).

***Mesochorus tetricus* Holmgren, 1860**

syn. *Mesochorus curvicauda* Thomson, 1886

Material: Kutjern: 1♀ May 2014, 1♀ 21 July–11 September 2013; Finnvik: 1♀ September 2017; Mølstre: 1♂ July 2016.

Distribution: Northern and Central Europe; known from Norway (Riedel & Hansen 2012 as *curvicauda*).

***Mesochorus thomsonii* Dalla Torre, 1901**

syn. *Mesochorus nigriceps* Thomson, 1886, preoccupied by Brischke, 1880

Material: Enningdalen: 1♀ 21 June 2009; Eløya: 1♀ 20 July–28 August 2019.

Distribution: Europe; known from Norway (Jussila 1973 as *nigriceps*).

***Mesochorus tibialis* Schwenke, 2002**

Material: Råkil: 1♀ 16 July 1994; Skittmyr: 1♀ 7 September 2019.

Distribution: Known from Germany, new record for Norway and Scandinavia.

***Mesochorus tipularis* Gravenhorst, 1829**

Material: Hosanger 1: 1♀ 14 September–2 November 2019.

Distribution: Holarctic; known from Norway (Riedel & Hansen 2015).

***Mesochorus triangulus* Schwenke, 1999**

Material: Skår: 1♀ June 2015, 1♀ August 2015, 1♀ September 2015, 2♀♀ June 2016, 2♀♀ July 2016, 2♀♀ August 2016, 2♀♀ June 2017, 2♀♀ July 2017, 2♀♀ August 2017, 1♀ August 2018, 2♀♀ June 2018, 1♀ July 2018, 1♀ August 2018, 1♀ September 2018; Finnvik: 1♀ September 2013, 1♀ July 2016, 2 , 1♀ October 2017, 2♀♀ June 2019, 1♀ August 2019, 1♀ September 2019; Mølstre: 1♀ June 2014, 15♀♀ July 2014, 6♀♀ August 2014, 1♀ July 2016, 3♀♀ August 2016, 3♀♀ September 2016, 2♀♀ August 2019, 2♀♀ September 2019; Opsalneset: 1♀ July 2017, 1♀ September 2017, 3♀♀ August 2018;

Hosanger 1: 1♀ 18 May–18 June 2019, 4♀♀ 18 June–13 July 2019, 3♀♀ 13 July–9 August 2019, 4♀♀ 9 August–14 September 2019; Rekvei: 1♀ 7 September 2019; Revtangen 1: 1♀ 22 September 2017, 1♀ 24 August 2019, 1♀ 27 August 2019; Njåskogen: 1♀ 11 August–18 September 2019.

Distribution: Central Europe, Finland and Sweden (Riedel 2020), new record for Norway.

***Mesochorus tuberculiger* Thomson, 1886**

Material: Sandbakken: 1♂ 13 September 1995.

Distribution: Palaearctic; known from Norway (Riedel *et al.* 2005).

***Mesochorus viator* Schwenke, 2004**

Material: Mølstre: 1♀ July 2014.

Distribution: Known from the Netherlands, new record for Norway and Scandinavia.

***Mesochorus vittator* Zetterstedt, 1838**

Material: Finnvik: 1♀ August 2016; Mølstre, 1♀ June 2014, 1♀ July 2014, 1♂ August 2014, 1♀ June 2016, 1♀ August 2019; Munkebråten: 1♀ 12 August 2010; Tomter: 1♀ August 2011; Skjærhalden: 1♀ 4 June 2010; Opsalneset: 1♀ July 2014; Talgje: 1♂ 9 June–9 July 2019; Brusand S: 1♀ 2–17 July 2019, 1♀ 17–27 July 2019; Indraberget: 1♀ 21 September–16 November 2019; Revtangen 1: 1♀ 28 August 2019, 1♀ 16 September 2019.

Distribution: Holarctic and Neotropical; known from Finland, Sweden and Norway (Strand 1906, Roman 1936, Horstmann 2006).

***Mesochorus vitticollis* Holmgren, 1860**

Material: Mølstre: 1♀ July 2014, 1♀ June 2015, 2♀♀ July 2016, 1♀ July 2017; Skår: 1♀ August 2015, 2♀♀ June 2016, 1♀ July 2016, 1♀ August 2016, 1♀ June 2017, 2♀♀ July 2017, 1♀ August 2017; Oppsalsneset: 1♂ July 2016, 1♀ August 2017, 1♀ August 2018; Munkebråten: 1♀ 12 August 2010; Langøya: 1♀ 8 July–2 August 1991; BØ; Tistel Gård: 1♀ 30 July 2010; Revtangen 2: 2♀♀ 6 July 2012, 1♀ 19 July 2012, 1♀ 15 August 2012, 2♀♀ 4 August 2014, 1♀ 5 July 2015, 1♀ 20 July 2015; Talgje: 2♀♀ 9 June–9 July 2019; Hosanger 1: 1♀ 18 May–18 June

2019, 1♀ 18 June–13 July 2019, 1♀ 9 August–14 September 2019; Revtangen 1: 3♀ 1♂ 25 July–4 August 2019.

Distribution: Europe; known from Denmark, Finland, Sweden and Norway (Strand 1906, Jussila 1973).

Mesochorus zoernerii Schwenke, 1999

Material: Finnvik: 1♀ July 2019, 1♂ August 2019, 1♀ September 2019.

Distribution: Known from Germany and Sweden, new record for Norway.

Discussion

Our findings increase the number of Norwegian Mesochorinae from 49 to 92 different species, less than 1/3 of the known European Mesochorinae species. For *Astiphromma* Förster, 16 of 28 known European species (57 %), for *Mesochorus* Gravenhorst, 75 of 332 European species (22 %) and for *Cidaphus* Förster, one of three European species have been reported from Norway so far. The single species of *Dolichochoerus*, *D. longiceps* (Strobl) was not found in Norway to date.

This diversity of Mesochorinae in Norway is comparable with other Scandinavian countries, such as Finland with 101 reported Mesochorine species (Yu *et al.* 2016) or Sweden with 112 species (Riedel 2020). Since some species-groups of the large genus *Mesochorus* Gravenhorst would still need a new and detailed revision for a correct separation and determination of several species, especially the *declinans*- and *pectoralis*-groups sensu Schwenke (1999), a portion of our collected Norwegian material (c. 15 %) could still not be determined certainly. We suppose a significant higher number of the subfamily Mesochorinae in Norway when more revisions, molecular data and host records will be available in the future.

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generous donation of their collected Norwegian Mesochorinae for this study.

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APPENDIX. Collection sites and collectors. Abbreviations. MT=Malaise trap, AAI=Aust-Agder (interior), HOY=Hordaland (coastal), Ø=Østfold, SFI=Sogn og Fjordane (interior), RI=Rogaland (interior), RY: Rogaland (coastal), VE=Vestfold.

Alby: Ø, Moss, Jeløy, Alby, 59.42279°N 10.61283°E, leg. Thor Jan Olsen.

Åstad: RY, Soknal, Åstad, 58.2017°N 6.1800°E, leg. Jarl Birkeland.

Bjerkebakke: Ø, Spydeberg, Bjerkebakke, 59.58343°N 11.02626°E, leg. Gro Aase & Thor Jan Olsen.

Brusand N: RY, Hå, Brusand N, 58.53872°N 5.74565°E, MT, leg. Alf Tore Mjøs.

Brusand S: RY, Hå, Brusand S, 58.53657°N 5.75154°E, MT, leg. Alf Tore Mjøs.

Buerbakkene: Ø, Rakkestad, Buerbakkene, 59.43776°N 11.27063°E, leg. Thor Jan Olsen.

Buviken: Ø, Marker, Buviken, 59.57619°N 11.51891°E, leg. Thor Jan Olsen.

Bøensætra: Ø, Aremark, Bøensætra, 59.31554°N 11.72493°E, leg. Thor Jan Olsen.

Eløya: Østfold, Rygge, island Eløya, N 59.31973° E 10.65882°, MT, leg. Thor Jan Olsen.

Enningdalen: Ø, Halden, Enningdalen, 58.89588°N 11.52092°E, MT, leg. Thor Jan Olsen.

Finnvik: RY, Suldal, Finnvik, 59.448504°N 6.021319°E, MT, leg. Håkon Haraldseide.

Flesjøvannet: Ø, Våler, Flesjøvannet, 59.43645°N 10.98008°E, leg. Thor Jan Olsen.

Gaupstein: Ø, Hobøl, Gaupstein, 59.69559°N 10.99189°E, MT, leg. Thor Jan Olsen.

Holleby: Ø, Sarpsborg, Holleby, 59.34435°N 11.11598°E, MT, leg. Thor Jan Olsen.

Hosanger 1: HOY, Osterøy, Hosanger, 60.56832°N 5.48575°E, MT, leg. Alf Tore Mjøs.

APPENDIX. continued

- Hosanger 2:** HOY, Osterøy, Hosanger, 60.5679°N 5.4860°E, light trap, Alf Tore Mjøs.
- Indraberget:** RY, Sola, Indraberget, 58.91242°N 5.66279°E, MT, leg. Arjen Leendertse.
- Kjetså:** AAL, Evje & Hornnes, Kjetså, 58.54398°N 7.75592°E, MT, leg. Lars Breistol.
- Kutjern:** Ø, Aremark, Kutjern, 59.27711°N 11.58547°E, MT, leg. Gro Aase & Thor Jan Olsen.
- Langøya:** VE, Re [Våle], Langøya, 59.499817°N 10.366113°E, MT, leg. Lars Ove Hansen.
- Lindtjern:** Ø, Aremark, Lindtjern, 59.18758°N 11.64770°E, MT, leg. Thor Jan Olsen.
- Lærdal:** SFI, Lærdal, 61.06533°N 7.50121°E, leg. Thor Jan Olsen.
- Mølstre:** HOY, Sveio, Mølstre, 59.516399°N 5.277373°E, MT, leg. Håkon Haraldseide.
- Munkebråten:** Ø, Rakkestad, Munkebråten, 59.24667°N 11.39068°E, leg. Thor Jan Olsen.
- Myrvold:** Ø, Spydeberg, Myrvold, 59.53458°N 11.01041°E, leg. Thor Jan Olsen.
- Nord i Fjella:** Ø, Hvaler, Vesterøy, Nord i Fjella, 59.09239°N 10.87868°E, leg. Gro Aase & Thor Jan Olsen.
- Njåskogen:** RY, Time, Njåskogen, 58.75569°N 5.68781°E, MT, leg. Alf Tore Mjøs.
- Ognasanden:** RY, Hå, Ognasanden, 58.51237°N 5.79923°E, MT, leg. Jarl Birkeland.
- Oppsalsneset:** RY, Vindafjord, Oppsalsneset, 59.29479°N 5.52589°E, MT, leg. Håkon Haraldseide & E. Thorsen.
- Øra:** Ø, Fredrikstad, Øra, 59.19713°N 10.99386°E, leg. Thor Jan Olsen.
- Presthammar:** RY, Karmøy, Presthammar, 59.2418695°N 5.2159472°E, light trap, leg. Leiv-Tommas Haugen.
- Råkil:** Ø, Sarpsborg, Tune, Råkil (EIS 20), 59.29737°N 11.10056°E, leg. Thor Jan Olsen.
- Rekedal:** RY, Soknal, Rekedal, 58.2139°N 6.1550°E, MT, leg. Jarl Birkeland.
- Rekvei:** RY, Soknal, Rekvei, 58.2035°N 6.1559°E, MT, leg. Jarl Birkeland.
- Revtangen 1:** RY, Klepp, Revtangen OS, 58.76181°N 5.50807°E, light trap, leg. Alf Tore Mjøs.
- Revtangen 2:** RY, Klepp, Revtangen Bird Observatory, 58.7619°N 5.5081°E, light trap, leg. Alf Tore Mjøs.
- Rokke:** Ø, Halden, Vesttorp, Rokke, 59.19547°N 11.29318°E, leg. Thor Jan Olsen.
- Sandbakken:** Ø, Sarpsborg, Sandbakken, 59.23515°N 11.18047°E, leg. Thor Jan Olsen.
- Sandbekk:** RY, Sokndal, Sandbekk, 58.35748°N 6.32193°E, leg. Jarl Birkeland.
- Skår:** RY, Karmøy, Skår, 59.287979°N 5.264283°E, MT, leg. Håkon Haraldseide.
- Skjeberg:** Ø, Sarpsborg, Skjeberg Kirke, 59.22720°N 11.19116°E, leg. Thor Jan Olsen.
- Skjærhalden:** Ø, Hvaler, Skjærhalden, 59.02546°N 11.02664°E, leg. Thor Jan Olsen.
- Skittmyr:** RY, Soknal, Skittmyr, 58.2102°N 6.18197°E, leg. Jarl Birkeland.
- Smedalsvatn:** SFI, Lærdal, Smedalsvatn, 61.16383°N 8.01688°E, leg. Thor Jan Olsen.
- Soknal:** RY, Soknal, 58.2120°N 6.10908°E, leg. Jarl Birkeland.
- Talgje:** RY, Finnøy, Talgje, 59.11108°N 5.84658°E, MT, leg. Gaute Tengesdal.
- Tistel Gård:** SFI, Sogn, Vik, Tistel Gård, 61.05656°N 6.53549°E, leg. Thor Jan Olsen.
- Tomter:** Ø, Sarpsborg, Tomter, 59.646674°N 10.98812°E, MT, leg. Thor Jan Olsen.
- Vikaneset 1:** RI, Sauda, Vikaneset, 59.56847°N 6.28322°E, MT, leg. Øyvind Nyvold Larsen.
- Vikaneset 2:** RI, Sauda, Vikaneset, 59.56888°N 6.28494°E, MT, leg. Øyvind Nyvold Larsen.
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