

First records of the ichneumonid wasp *Misetus nordicator* Selfa, 1995 (Hymenoptera, Ichneumonidae) outside Sweden, with the description of the male

JANKO KOLAROV & LARS OVE HANSEN

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This study deals with the first Norwegian records of the ichneumonid wasp *Misetus nordicator* Selfa, 1995. 24 males and one female were recorded from 13 Norwegian localities in the period 1996–2016: i.e. Østfold [Ø] Halden: Vesttorp; Akershus [AK] Frogn: Lågøya; Oslo [AK] Oslo: Hovedøya, Ullensaker: Sessvollmoen; Buskerud [BØ] Kongsberg: Skollenborg; Telemark [TEY] Drangedal: Ronnomdalen; Aust Agder [AAY] Grimstad: Rønnes and Marivold; Hedmark [HEN] Åmot: Kildesaga; Nordland [NSI] Grane: Majavatn and Nordre Laksforsmo; Finnmark [FV] Alta: Kåfjord and Detsika; all captured in Malaise traps. These are the first findings of *M. nordicator* outside Sweden as well as the first records of the male worldwide. A description of the male is provided and illustrated with four figures, and a world key to the genus is given. It is clear that the genus *Misetus* Wesmæl, 1845 contains at least two species in Norway: *M. oculatus* Wesmæl, 1845 and *M. nordicator*. Both species are found scattered in Southern and Central Norway, but *M. nordicator* seems apparently to be the most abundant of these species, and may have a slightly more northern expansion than *M. oculatus*. Previous records of *Misetus* from Norway are listed.

Key words: Ichneumonidae, Ichneumoninae, Phaeogenini, *Misetus*, male description, Norway, Europe, malaise trap, key, Embrik Strand.

Janko Kolarov, Pedagogy Faculty, University of Plovdiv, 24 Tsar Assen Str., 4000 Plovdiv, Bulgaria. E-mail: j.kolarov@abv.bg

Lars Ove Hansen, Natural History Museum, University of Oslo, P.O. Box 1172 Blindern, NO-0318 Oslo, Norway. E-mail: l.o.hansen@nhm.uio.no.

Introduction

The genus *Misetus* Wesmæl, 1845 belongs to the tribe Phaeogenini (Ichneumoninae) and comprises six described species worldwide, where all except one are European (Kwon *et al.* 2012, Yu *et al.* 2016). The genus contained for a long time only one European species, *Misetus oculatus* Wesmæl, 1845, until two recent studies expanded the genus with four more species (Kolarov 1985, Selfa & Diller 1995). *M. oculatus* is apparently the most common species in the genus and was reported

from Norway for the first time from Nordland [NSI] Hattfjelldal: Skarmodalen (Strand 1901). Later it was recorded from Troms [TRI] Målselv: Øverbygd (Roman 1936), and more recently from Østfold [Ø] Sarpsborg: Sarpsborg (Riedel & Berg 1997). The interactive database «Artskart» adds one more record, i.e. Nordland [NNØ] Hamarøy: Hillingspollen (Artsdatabanken 2020).

M. nordicator Selfa, 1995 was described from a single female from Gällivare, Northern Sweden (Selfa & Diller 1995). This account deals with the first record of *M. nordicator* outside Sweden, and

the first records of the male ever as well.

The name *Misetus oculus* var. *obscurus* Berthoumieu, 1896 is invalid, because varieties described by Berthoumieu are considered as infrasubspecific and therefore unavailable names according to the Code of Nomenclature, and the types are lost (Diller & Horstmann 1994). The name thus, should not be used for any of these taxa.

Material and methods

This contribution focuses on pinned material deposited at the Natural History Museum of Oslo [NHMO], Norway, and all examined records refer to pinned and fully labeled specimens. The faunistic divisions in Norway are given in **bold** and follow Økland (1981). The new county division introduced from 1 January 2020 has not been implemented in this study (Regjeringen 2020), mainly because all records given here are from before this county reform. The coordinates are given in decimal degrees (Grid: Lat/Lon hddd.dddd°N/E; datum: WGS84). The taxonomy follows Yu *et al.* (2016). Data on biology and distribution are extracted from Yu *et al.* (2016) and Zwakhals (2020).

The records

Misetus nordicator Selfa, 1995

Male description. Fore wing 5.3 mm long, body moderately slender (Figure 1), 7.0 mm long. Head distinctly narrowed behind eyes. Frons polished. Distance between lateral ocellus and eye 1.1 as long as ocellar diameter. Occipital carina complete dorsally, connected with hypostomal carina close to base of mandible. Flagellum moderately stout, 27-segmented, first segment 2.7 as long as wide, all segments elongated, 8–16 segments with tyloidae. Temple 0.6 as long as eye diameter. Face polished, sparsely punctured, 1.75 as wide as high, convex medially (Figure 2). Clypeus well separated from face. Malar space mat, 0.75 as long as base of mandible. Upper tooth of mandible longer than lower tooth.

Mesosoma with moderately dense puncture, upper 2/3 of mesopleurum longitudinally striated (Figure 3). Notaulus deep and crenulated, almost reaching middle of mesonotum. Prepectal carina reaching subtegular ridge. Sternaulus deeply impressed in anterior half of mesopleurum. Areolet of fore wing wide, R1 originated a little behind middle of pterostigma. Nervulus interstitial, parallel vein joins postnervulus a little below middle. Nervellus reclival, intercepted in lower third. Hind wing with 7 distal hamuli. Legs moderately stout, hind femur 4.1 as long as wide. Length of hind tarsal segments 45:23:17:10:12. Propodeum completely carinated. Areola hexagonal, slightly elongated. Area posteromedia transversally striated. Costula a little before middle of areola. Propodeal spiracle circular, equidistant from lateral and pleural carina.

Metasoma gradually widens from base to fifth tergum. Postpetiolus and most part of second tergum longitudinally striate. Distance between thyridium and base of second tergum equals thyridium width (Figure 4). Second tergum longer than wide, third tergum almost square. 3–6 terga coarsely punctured, shining, third tergum mat basally. Black; upper half of facial orbit, palpi and coxae apically yellow; hind legs sometimes also scapus from below and paramerae reddish; hind femur sometimes partly darkened, hind tibia apically and hind tarsus darkened; metasoma varying in color; 2–7 terga black with yellow reddish apical band, sometimes third tergum basally and laterally reddish (in one specimen face orbit entirely black, apical band of metasomal terga reddish brown).

Material examined [NHMO]: NORWAY, Østfold [Ø] Halden: Vesttorp [59.198319°N 11.299774°E ±100m] 1♂ 4 July–15 August 2013, leg. Thor Jan Olsen [det. Matthias Riedel 2013 as *M. oculus*]; Akershus [AK] Frogn: Lågøya [59.735408°N 10.567494°E ±4m] 1♂ 28 May–17 June 2016, malaise trap 2 / island / shore / forest edge / 5m asl, leg. Hallvard Elven & Lars Ove Hansen; Oslo [AK] Oslo: Hovedøya SE [59.89243°N 10.73284°E ±10m] 1♂ 21 July–26 August 2005, malaise trap, deciduous forest / 20m asl, leg. Øivind Gammelmo & Ole Jørgen Lønnve; Akershus [AK] Ullensaker: Sessvollmoen,

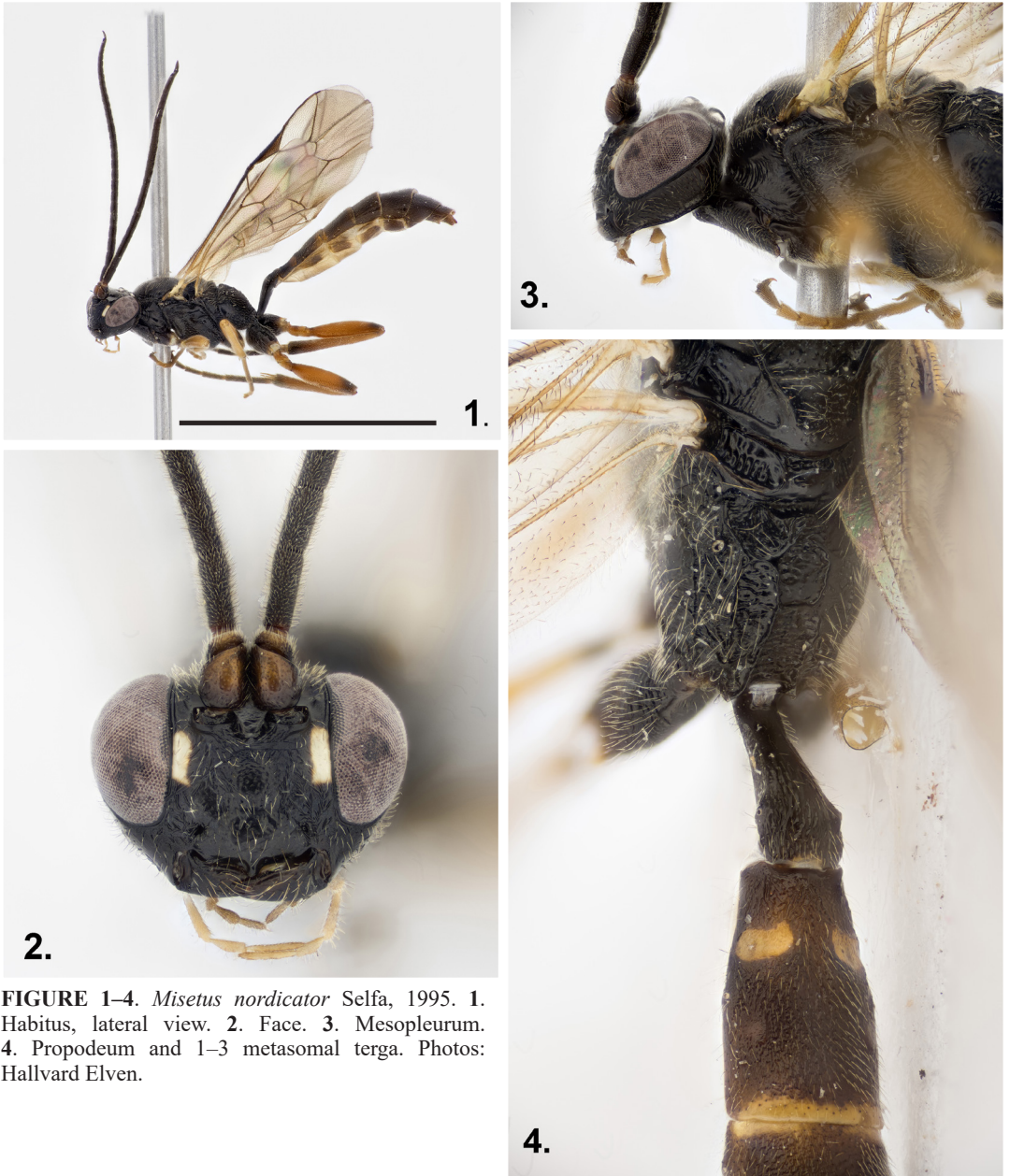


FIGURE 1–4. *Misetus nordicator* Selfa, 1995. 1. Habitus, lateral view. 2. Face. 3. Mesopleurum. 4. Propodeum and 1–3 metasomal terga. Photos: Hallvard Elven.

Aurtjernet W [60.231473°N 11.116603°E ±5m] 1♂ 26 June–25 August 2007, malaise trap C / sandy area / forest edge / 200m asl, leg. Lars Ove Hansen, det. Andrei Humala 2008 as *M. oculatus*; Buskerud [BØ] Kongsberg: Skollenborg, Laugerudmoen [59.627539°N 9.665037°E ±5m] 1♂ 2 August–28 September 2008, malaise trap W

/ sand pit / pine forest, leg. Lars Ove Hansen, det. Andrei Humala 2008 as *M. oculatus*; Telemark [TEY] Drangedal: Rønno mdalen [59.121604°N 8.823351°E ±50m] 1♂ 6 June–3 August 1999, malaise trap / forest slope, 315m asl, leg. Anders Bjørnstad; Aust Agder [AAY] Grimstad: Rønnes, Tollholtheia [58.340696°N 8.609948°E ±5m]

2♂♂ 15 April–3 August 2015, malaise trap / pine forest / 35m asl, leg. Jon Peder Lindemann; Grimstad: Rønnes, Osterkilen W [58.338255°N 8.612404°E ±5m] 1♂ 10 May–11 September 2016, malaise trap / oak forest / 30m asl, leg. Jon Peder Lindemann; Grimstad: Marivold, Rossevika [58.335066°N 8.624813°E ±5m] 1♂ 10 May–11 September 2016, malaise trap / mixed forest / 30m asl, leg. Jon Peder Lindemann; Hedmark [HEN] Åmot: Kildesaga [61.178778°N 11.402167°E ±10m] 3♂♂ 23 June–11 July 2016, malaise trap 1 / rich wood and scrub-covered lowland fen / 290m asl, leg. Trond Andersen & Linn K. Hagenlund; Nordland [NSI] Grane: Nordre Laksforsmo, Geitklauvmyra [65.60632°N 13.28757°E ±5m] 3♂♂ 12 July–11 August 2016, Malaise trap / spruce forest / 120m asl, leg. Jon Peder Lindemann; Grane: Majavatn W [65.16219°N 13.37686°E ±5m] 1♂ 13 July–8 August 2016, Malaise trap / spruce forest / bog / 390m asl, leg. Jon Peder Lindemann; Finnmark [FV] Alta: Kåfjord, Møllernes [69.95030°N 23.05851°E ±25m] 6♂♂ 03 July–8 August 1996, Malaise trap / south faced slope / scree / 130m asl, det. Lars Ove Hansen / Helge Rinden; Alta: Detsika, Buolamalia [69.8628°N 23.3297°E ±10m] 1♂1♀ 24 June–16 July 1996, Malaise trap / sandy slope / 60m asl, det. Lars Ove Hansen / Helge Rinden.

Distribution: Norway and Sweden.

Misetus oculus Wesmael, 1845

Material examined [NHMO]: NORWAY, Østfold [Ø] Hvaler: Kjerkøy, Ørekroken [59.03308°N 11.01048°E ±5m,] 1♂ 16 July–15 August 2003, malaise trap A / east of stream / sandy shore / pine forest / 5m asl, leg. Lars Ove Hansen; Oslo [AK] Oslo: Ljanselva, Leirskallbråten W [59.855164°N 10.816906°E ±10m] 1♂ 13 June–15 July 2009, malaise trap / river shore / mixed forest / 106m asl, leg. Eirik Rindal / Geir Søli; Akershus [AK] Ullensaker: Sessvollmoen, Aurtjernet W [60.231473°N 11.116603°E ±5m] 1♀ 26 June–25 August 2007, malaise trap C / sandy area / forest edge / 200m asl, leg. Lars Ove Hansen, det. Andrei Humala 2008; Aurtjernet W [60.22954°N 11.11133°E ±5m] 1♂ 30 June–12 August 2008, malaise

trap S / sandy area / forest edge / pine forest / 200m asl, leg. Lars Ove Hansen; Buskerud [BØ] Kongsberg: Skollenborg, Laugerudmoen [59.627539°N 9.665037°E ±5m] 1♀ 2 August–28 September 2008, malaise trap W / sand pit / pine forest, leg. Lars Ove Hansen, det. Andrei Humala 2008; Telemark [TEY] Drangedal: Rønnoaldalen [59.121604°N 8.823351°E ±50m] 1♀ 6 June–3 August 1999, malaise trap / forest slope, 315m asl, leg. Anders Bjørnstad; Nordland [NSI] Hattfjelldal: Skarmodalen 1♀ [collected between 1898 – 1900, lacking abdomen], det. Pierre Jules Tosquinet and Matthias Riedel (Figure 5).

Distribution: Austria, Belgium, Bulgaria, Czech Republic, Finland, France, Germany, Ireland; Italy, Latvia, Netherlands, Norway, Poland, Romania, Russia (Krasnodar Kray, Moscow Oblast), Spain, Sweden and United Kingdom (Yu *et al.* 2016, Zwakhals 2020).

Comments: *M. oculus* was reported from Nordland [NSI] Hattfjelldal: Skarmodalen (Strand 1901) which coincides with the specimen in the collections at NHMO. *M. oculus* has previously been reported from Troms [TRI] Målselv: Øverbygd (Roman (1936), and more recent Østfold [Ø] Sarpsborg: Sarpsborg (Riedel & Berg 1997). The interactive database «Artskart» adds one more record, i.e. Nordland [NNØ] Hamarøy: Hillingspollen (Artsdatabanken 2020). These records were not examined in this work,



FIGURE 5. Labels of *Misetus oculus* Wesmael, 1845 collected in Skarmodalen, Hattfjelldal in Nordland by Embrick Strand between 1898–1900. Determinator labels by Pierre Jules Tosquinet from around 1900 and Matthias Riedel from 2000. Photo. Lars Ove Hansen.

Key to the species of the genus *Misetus* Wesmael, 1845.

1.	Females	2
–	Males	5
2 (1)	Apical ridge of some metasomal terga strongly concave	3
–	Apical ridge of some metasomal terga weakly concave	4
3 (2)	Apical ridge of 3–7 metasomal terga concave. Genal carina meets oral carina near base of mandibulae. Basal area not delimited. Middle field of postpetiolus punctate. Flagellum with 31–33 segments. Hind tibia completely blackish brown. Male unknown	<i>M. borealis</i> Kusigemati 1974 [Japan, Korea]
–	Apical ridge only of 5 (apically) – 6–7 metasomal terga concave. Genal carina meets oral carina far from base of mandible. Area basalis delimited. Middle field of postpetiolus strigose. Flagellum with 27 segments. Hind tibia mostly red	<i>M. nordicator</i> Selfa, 1995 [Norway, Sweden]
4 (2)	Head strongly narrowed in frontal view. Postpetiolus with punctures and rugae apically. Base of metasomal tergum 2 rugose. Scutellum with yellow marking. Hind femur entirely red. Metasoma extensively red	<i>M. oculus</i> Wesmael, 1845 [Europe, including Norway and Sweden]
–	Head weakly narrowed in frontal view. Postpetiolus punctate and less striate. Base of metasomal tergum 2 strigose. Scutellum black. Hind femora reddish brown to dark brown. Metasoma extensively black	<i>M. hispanator</i> Selfa, 1995 [Spain]
5 (1)	Tyloidae absent. Thyridia separated from tergum base to a distance shorter than its width. Costula strong. Area superomedia as long as wide. Dorsolateral carina of postpetiolus distinct. Gastral tergum 2 quadrangular and dull, its base rugose. Tegulae black. Female unknown	<i>M. nigrutilus</i> Kolarov, 1985 [Bulgaria]
–	Tyloidae present. Thyridia separated from tergum base to a distance longer than its width. Costula weak. Area superomedia longer than wide. Dorsolateral carina of postpetiolus weak. Gastral tergum 2 long, with different structure. Tegulae red or yellow	6
6 (5)	Area superomedia not well defined. Tyloidae on flagellar segments 4–18. Temple as long as eye width. Hind femur mostly blackish brown. Female unknown	<i>M. tyloidalis</i> Kolarov, 1985 [Bulgaria]
–	Area superomedia well defined. Tyloidae on flagellar segments 7(8)–14(15) (16). Temple shorter than eye width. Hind femur mostly red, rarely darkened	7
7 (6)	Metasoma narrowed starting from tergum 3. Area superomedia irregular. Middle field of postpetiolus strigose or punctate. Scutellum black. Hind coxa black. Metasomal terga 2–3 mostly black	<i>M. hispanator</i> Selfa, 1995 [Spain]
–	Metasoma with different structure. Area superomedia regular. Hind coxa reddish. Metasomal terga 2–3 red or black with yellow reddish apical band	8
8 (7)	Metasoma with parallel lateral sides. Metasomal terga 2–3 red. Scutellum with yellow spot	<i>M. oculus</i> Wesmael, 1845 [Europe, including Norway and Sweden]
–	Metasoma gradually widened from base to fifth tergum. Metasomal terga black with yellow red apical band. Scutellum entirely black	<i>M. nordicator</i> Selfa, 1995 [Sweden, Norway]

since they are not present in the collections at NHMO. The collector of the Hamarøy specimen indicates that this record most probably represents *M. nordicator* (Tomas Husdal in litt.).

Discussion

It is clear that the genus *Misetus* contains at least two species in Norway. *M. nordicator* seems apparently to be the most abundant of these, and may have a more northern expansion than *M. oculatus*, but both species are found scattered in Southern and Central Norway. *M. nordicator* is certainly overlooked, but was expected since the holotype is from Gällivare in Northern Sweden. The material of *Misetus*, and in particular Northern European material of *M. oculatus* should be revised.

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