

Lacewings (Neuroptera) and Alderflies (Megaloptera) from Finnmark, northern Norway

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Records of 22 species of Neuroptera and four species of Megaloptera from Finnmark, northern Norway are presented based partly on material collected in 2010, partly on material housed in the entomological collections at the Natural History museums in Norway. Of these, 13 species have previously not been recorded from Finnmark, i.e.: *Coniopteryx tineiformis* Curtis, 1834; *Hemerobius atrifrons* McLachlan, 1868; *H. fenestratus* Tjeder, 1932; *H. humulinus* Linnaeus, 1758; *H. marginatus* Stephens, 1836; *H. nitidulus* Fabricius, 1777; *H. pini* Stephens, 1836; *Micromus angulatus* (Stephens, 1836); *Symphorobius fuscescens* (Wallengren, 1863); *Wesmaelius concinnus* (Stephens, 1836); *W. mortonii* (McLachlan, 1899); *W. quadrifasciatus* (Reuter, 1894) and *Chrysoperla carnea* (Stephens, 1836). The total number of Neuroptera known to occur in Finnmark is now 23 of which four belong in the family Coniopterygidae, 17 in Hemerobiidae, and one in each of the families Chrysopidae and Sisyridae.

All four species of Megaloptera reported in this paper belong to the genus *Sialis* Latreille, 1802, the sole genus of the order occurring in Norway. One of these, *Sialis sibirica* McLachlan, 1872, is recorded as Data Deficient (DD) in the 2010 Norwegian Red List for Species. In addition to the four species reported here a fifth species, *Sialis lutaria* (Linnaeus, 1758) is known to occur in Finnmark.

Key words: Neuroptera, Megaloptera, distribution, Finnmark, Norway.

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Introduction

Early records of Neuroptera and Megaloptera species from northern Norway were published among others by McLachlan (1899) and Esben-Petersen (1902, 1910). Tjeder (1943) summarized these records and published new records from Nordland, Troms and Finnmark. An account of the Norwegian species of the family Coniopterygidae was published by Greve (1997), giving records of three species from Finnmark. In Limnofauna Norvegica (Aagaard & Dolmen 1996) check-lists of the Norwegian Megaloptera species and of the Neuroptera family Sisyridae are given, but without exact information on the localities of the different species (Greve 1996a, b). Records

of a few species are also available in Artskart (Artsdatabanken 2012).

In the present article we give new records of 22 species of Neuroptera and 4 species of Megaloptera from Finnmark. The article is partly based on the material collected in 2010 during the project "Insects inhabiting freshwater and humid habitats in Finnmark, northern Norway" (Ekrem *et al.* 2012). However, as the Neuroptera are mainly terrestrial, several species were not taken during the project focusing on freshwater and humid habitats. In addition, we therefore include records of all specimens of Neuroptera and Megaloptera identified by the senior author and housed in the Natural History museums in Oslo, Bergen, Trondheim and Tromsø.

Material and methods

Most of the material was collected during the project in Finnmark in 2010 and is listed under "Material" below. The localities are described in Ekrem *et al.* (2012) and are referred to below by the locality number only. Specimens of most species taken in 2010 have been DNA-barcoded (see Table 1). This material is preserved in alcohol and stored in the entomological collection at the Department of Natural History, University Museum of Bergen (ZMBN).

Unpublished records of Neuroptera and Megaloptera species identified by the senior author and housed in the entomological collections at the University Museum of Bergen; the Natural History Museum, Oslo (NHMO); The Museum of Natural History and Archaeology, Trondheim (VMTN); and in Tromsø University Museum (UMTN), are listed as "Additional material" below. In addition some records of Megaloptera larvae identified by Kjell M. Olsen are included. The biogeographical regions follow Økland (1981).

The species

NEUROPTERA

CONIOPTERYGIDAE

Coniopteryx tineiformis Curtis, 1834

Material. FinLoc81, 24 June–20 July 2010, 1 ♀, Malaise trap.

Remarks. The species has a Holarctic distribution (Aspöck *et al.* 1980, Norman *et al.* 1997). It is distributed all over Europe north to Fennoscandia (Aspöck & Aspöck 2012). In Norway the species has previously been recorded north to Nordland (Greve 1997).

As female *Coniopteryx* are difficult to identify to species, the identification of this species is based on the DNA-barcode (see Table 1).

Conwentzia pineticola Enderlein, 1905

Additional material. FV, Alta: Gargia, 69.80596°N 23.50197°E, 22 June–6 August 1996, 2 ♀♀, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN.

TABLE 1. Overview of barcoded specimens of Neuroptera and Megaloptera collected in Finnmark, northern Norway in 2010.

| Species | Locality no | Bold sample ID | Genbank no | Collection no |
|--------------------------------|-------------|----------------|------------|---------------|
| <i>Coniopteryx tineiformis</i> | FinLoc81 | FinHet81 | JX438301 | ZMBN A 45570 |
| <i>Hemerobius fenestratus</i> | FinLoc81 | FinHet82 | JX438305 | ZMBN A 45571 |
| <i>Hemerobius humulinus</i> | FinLoc19 | FinHet86 | JX438302 | ZMBN A 45573 |
| <i>Hemerobius marginatus</i> | FinLoc67 | FinHet58 | JX438306 | ZMBN A 45559 |
| <i>Hemerobius marginatus</i> | FinLoc55 | FinHet66 | JX438309 | ZMBN A 45562 |
| <i>Hemerobius perelegans</i> | FinLoc08 | FinHet64 | JX438308 | ZMBN A 45561 |
| <i>Hemerobius pini</i> | FinLoc7 | FinHet62 | JX438318 | ZMBN A 45560 |
| <i>Hemerobius simulans</i> | FinLoc05 | FinHet70 | JX438314 | ZMBN A 45564 |
| <i>Micromus angulatus</i> | FinLoc42 | FinHet79 | JX488293 | ZMBN A 45568 |
| <i>Wesmaelius concinnus</i> | FinLoc56 | FinHet87 | JX438307 | ZMBN A 45574 |
| <i>Wesmaelius nervosus</i> | FinLoc68 | FinHet68 | JX438317 | ZMBN A 45563 |
| <i>Wesmaelius nervosus</i> | FinLoc55 | FinHet71 | JX438313 | ZMBN A 45565 |
| <i>Sisyra nigra</i> | FinLoc65 | FinHet77 | JX438303 | ZMBN A 45567 |
| <i>Sialis fuliginosa</i> | FinLoc08 | FinHet80 | JX438315 | ZMBN A 45569 |
| <i>Sialis fuliginosa</i> | FinLoc81 | FinHet88 | JX438310 | ZMBN A 45575 |
| <i>Sialis morio</i> | FinLoc92 | FinHet75 | JX438311 | ZMBN A 45566 |
| <i>Sialis sibirica</i> | FinLoc21 | FinHet84 | JX438304 | ZMBN A 45572 |

Remarks. The species has a Holarctic distribution (Aspöck *et al.* 1980, Norman *et al.* 1997). It is distributed all over Europe north to Fennoscandia (Aspöck & Aspöck 2012). The species has previously been recorded from Alta (Greve 1997).

***Helicoconis lutea* (Wallengren, 1871)**

Material. FinLoc81, 24 June–20 July 2010, 1♂, Malaise trap.

Additional material. FV, Alta: Gargia, 69.80596°N 23.50197°E, 22 June–6 August 1996, 2♂♂, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN; Mattisdalen south, 69.95956°N 23.40562°E, 23 June–4 August 1996, 1♂, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN.

Remarks. The species has a Holarctic distribution (Aspöck *et al.* 1980, Norman *et al.* 1997). It is distributed in most parts of Europe north to Fennoscandia (Aspöck & Aspöck 2012). The species has previously been recorded from several localities in Finnmark (Greve 1997).

HEMEROBIIDAE

***Hemerobius atrifrons* McLachlan, 1868**

Additional material. FV, Alta: Detsika, Buolamalia, 69.86255°N 23.33996°E, 6 August–25 September 1996, 1♂, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN; Gargia, 69.80596°N 23.50197°E, 27 July 1979, 1♀, net, leg. L. Greve, coll. ZMBN; 22 June–6 August 1996, 4♂♂8♀♀, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN; Mattisdalen south, 69.95956°N 23.40562°E, 23 June–4 August 1996, 1♂1♀, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN; FN Tana: Levajok, 69.93260°N 26.45197°E, 5 July 1997, 1♀, net, leg. T.R. Nielsen, coll. ZMBN.

Remarks. The species is distributed in most parts of Europe north to northern Fennoscandia (Aspöck & Aspöck 2012, Meinander 1962). In Norway it is previously recorded north to Troms (Tjeder 1943).

***Hemerobius fenestratus* Tjeder, 1932**

Material. FinLoc 65, 20–30 July 2010, 1♂; 10–21 August 2010, 1♂, Malaise trap.

Remarks. The species is distributed in most parts of Europe north to Fennoscandia (Aspöck & Aspöck 2012). It was published as new to Norway by Greve (1976) based on specimens collected in Vestfold, southeastern Norway. The present record from Finnmark is the second record from Norway. One specimen of this species was barcoded (Table 1).

***Hemerobius humulinus* Linnaeus, 1758**

Material. FinLoc19, 6–20 August 2010, 1♀, Malaise trap. FinLoc21, 9–24 July 2010, 1♂, Malaise trap. FinLoc36, 28 July 2010, 1♂, net.

Remarks. The species has a Holarctic distribution (Aspöck *et al.* 1980, Norman *et al.* 1997). It is distributed all over Europe north to Fennoscandia (Aspöck & Aspöck 2012). In Norway there are confirmed records from as far north as southern Nordland and Aspöck *et al.* (1980) also mark a record from Troms in their map of the European distribution. One specimen of this species was barcoded (Table 1).

***Hemerobius marginatus* Stephens, 1836**

Material. FinLoc05, 10–23 July 2010, 1♀; 7–24 August 2010, 1♂1♀, Malaise trap. FinLoc06, 25 July 2010, 1♂, net. FinLoc07, 23 July 2010, 2♀♀, net. FinLoc19, 24 July–6 August 2010, 3♂♂, Malaise trap. FinLoc21, 24 July–6 August 2010, 3♂♂; 6–20 August 2010, 1♂; 20–31 August 2010, 1♂, Malaise trap. FinLoc27, 28 July 2010, 2♂♂1♀, net. FinLoc42, 26 July–25 August 2010, 1♀, Malaise trap. FinLoc55, 26 July 2010, 1♂, net. FinLoc56, 26 July–25 August 2010, 3♂♂1♀, Malaise trap. FinLoc60, 2 September 2010, 1♀, net. FinLoc64, 27 July 2010, 1♂, net. FinLoc67, 30 June 2010, 2♂♂1♀; 30 July 2010, 1♂, net. FinLoc68, 31 July 2010, 2♂♂3♀♀, net. FinLoc77, 30 July 2010, 1♂1♀, net. FinLoc81, 24 June–20 July 2010, 1♀; 20–30 July 2010, 5♂♂; 10–21 August 2010, 2♀♀, Malaise trap; 30 July 2010, 6♂♂2♀♀, net.

Additional material. FV, Alta: Detsika, Buolamalia, 69.86255°N 23.33996°E, 6 August–25 September 1996, 1♂, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN; Gargia, 69.80596°N 23.50197°E, 6 August–25 September 1996, 1♂2♀♀, Malaise trap, leg. L.O. Hansen

& H. Rinden, coll. ZMBN; **FØ**, Sør-Varanger: Elvenes, 69.68002°N 30.11797°E, 6 August 1996, 1♀, net, leg. J. Skartveit, coll. ZMBN; Øvre Pasvik, Noatun, 69.16532°N 29.24579°E, 23 July–7 August 1989, 3♂♂1♀, Malaise trap, leg. T.R. Nielsen, coll. ZMBN; Svanvik, Svanhovd, 69.45644°N 30.05056°E, 20 June–4 August 1986, 1♂, Malaise trap, leg. F. Midtgaard, coll. ZMBN.

Remarks. The species has a Palaearctic distribution from Europe eastwards to the Russian Far East and Japan (Aspöck *et al.* 1980, Makarkin & Monserrat 2007). It is distributed in most parts of Europe north to Fennoscandia (Aspöck & Aspöck 2012). In Norway it has previously been recorded north to Troms (Tjeder 1943). Two specimens of this species were barcoded (Table 1).

Hemerobius nitidulus Fabricius, 1777

Additional material. **FV**, Alta: Elvebakken, 69.97855°N 23.33670°E, 4 July 1979, 1♂, net, leg. L. Greve, coll. ZMBN; Gargia, 69.80596°N 23.50197°E, 1 July 1979, 1♂, net, leg. L. Greve, coll. ZMBN; **FØ**, Sør-Varanger: Øvre Pasvik, Noatun, 69.16532°N 29.24579°E, 23 July–7 August 1989, 1♂1♀, Malaise trap, leg. T.R. Nielsen, coll. ZMBN.

Remarks. The species is widespread in Europe north to Fennoscandia (Aspöck & Aspöck 2012). In Norway it has previously been recorded north to Troms (Tjeder 1943).

Hemerobius perelegans Stephens, 1836

Material. FinLoc08, 23 July 2010, 1♀, net.

Additional material. **FV**, Alta: Alta River Camp, 69.92976°N 23.26268°E, 30 June 1989, 1♂, net, leg. A. Fjellberg, coll. UMTN; Gargia, 69.80596°N 23.50197°E, 27 June 1979, 1♀; 1 July 1979, 1♀, net, leg. L. Greve, coll. ZMBN; Aavangen, 69.83820°N 23.39766°E, 28 June 1979, 1♀, net, leg. L. Greve, coll. ZMBN; **FI**, Kautokeino: Bidjovagge, 69.27721°N 22.48900°E, 1 July 1989, 1♀, net, leg. A. Fjellberg, coll. UMTN; **FN** Berlevåg: Berlevåg, 70.85141°N 29.09276°E, 5 July 1986, 1♂, net, leg. G.E.E. Søli, coll. ZMBN; 5–7 July 2002, 2♀♀, Malaise trap, leg. T.R. Nielsen, coll. ZMBN; **FØ**, Sør-Varanger: Øvre Pasvik, Gjøkåsen, 69.15285°N 29.18808°E,

26 June 1990, 1♂2♀♀, Malaise trap, leg. T.R. Nielsen, coll. ZMBN.

Remarks. The species is widespread in Europe north to Fennoscandia (Aspöck & Aspöck 2012). In Norway it is previously recorded north to Karasjok in Finnmark (Tjeder 1943). One specimen of this species was barcoded (Table 1).

Hemerobius pini Stephens, 1836

Material. FinLoc05, 10–23 July 2010, 2♂♂♂, Malaise trap. FinLoc07, 23 July 2010, 1♂, net. FinLoc21, 25 June–9 July 2010, 1♀, Malaise trap.

Additional material. **FV**, Alta: Gargia, 69.80596°N 23.50197°E, 1 July 1979, 1♂, net, leg. L. Greve, coll. ZMBN; Gargia Fjellstue, 69.80571°N 23.49102°E, 29 June 1979, 1♀, net, leg. L. Greve, coll. ZMBN.

Remarks. The species is distributed all over Europe north to Fennoscandia (Aspöck & Aspöck 2012). In Norway it is previously recorded north to southern Nordland (Tjeder 1943). One specimen of this species was barcoded (Table 1).

Hemerobius simulans Walker, 1853

Material. FinLoc05, 23 July 2010, 1♂, net.

Remarks. The species has a Holarctic distribution (Norman *et al.* 1997). It is widespread in Europe north to Fennoscandia (Aspöck & Aspöck 2012). In Norway it is previously recorded northeast to Sør-Varanger in Finnmark (Tjeder 1943). One specimen of this species was barcoded (Table 1).

Hemerobius stigma Stephens, 1836

Material. FinLoc56, 26 July–25 August 2010, 1♂1♀, Malaise trap. FinLoc65, 19–24 June 2010, 1♂, Malaise trap. FinLoc92, 30 July 2010, 1♂, net.

Additional material. **FV**, Alta: Elvebakken, 69.97855°N 23.33670°E, 4 July 1967, 2♂♂2♀♀, net, leg. L. Greve, coll. ZMBN; Detsika, Buolamalia, 69.86255°N 23.33996°E, 6 August–15 September 1996, 4♂♂5♀♀, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN; Gargia, 69.80596°N 23.50197°E, 27 June 1979, 1♂; 1 July 1979, 4♀♀; 2 July 1979, 2♀♀, net, leg. L. Greve, coll. ZMBN; Kåfjord, Møllnes, 69.94934°N 23.06244°E, 4 August–25 September 1996, 3♂♂♂, Malaise trap, leg. L.O. Hansen & H. Rinden, coll.

ZMBN; Aavangen, 69.83820°N 23.39766°E, 28 June 1979, 1♀, net, leg. L. Greve, coll. ZMBN; **FI**, Karasjok: Karasjok, 69.47025°N 25.50783°E, 14 July 1947, 1♂; 16 July 1947, 1♂, net, leg. A. Tjønneland & N. Lønøy, coll. ZMBN; **FØ**, Sør-Varanger: Øvre Pasvik, Gjøkåsen, 69.15285°N 29.18808°E, 26 June 1990, 2♀♀, Malaise trap, leg. T.R. Nielsen, coll. ZMBN; Øvre Pasvik, Noatun, 69.16532°N 29.24579°E, 23 July–7 August 1989, 8♂♂6♀♀; 24 August–5 September 1989, 2♂♂, Malaise trap, leg. T.R. Nielsen, coll. ZMBN; Øvre Pasvik, Juomisjärvi (Fiskevatn), 69.33577°N 29.14619°E, 25 June 1966, 1♂1♀, net, leg. R. Mehl, coll. NHMO; Svanvik, Svanhovd, 69.45644°N 30.05056°E, 20 June–4 August 1986, 3♂♂ 1♀; 4 August–1 September 1986, 1♀, Malaise trap, leg. F. Midtgaard, coll. ZMBN; Øvre Pasvik, Vaggatem, 69.21385°N 29.15538°E, 9 July 1965, 1♂, net, leg. C.F. Lühr, coll. NHMO.

Remarks. The species has a Holarctic distribution (Norman *et al.* 1997). It is distributed in most parts of Europe north to Fennoscandia (Aspöck & Aspöck 2012). In Norway it is previously recorded north to Karasjok in Finnmark (Esben-Petersen 1910).

Micromus angulatus (Stephens, 1836)

Material. FinLoc42, 26 July–25 August 2010, 1♀, Malaise trap; 26 July 2010, 1♀, net. FinLoc67, 30 July 2010, 1♀, net. FinLoc81, 24 June–20 July 2010, 1♀, Malaise trap.

Additional material. **FV**, Alta: Gargia, 69.80596°N 23.50197°E, 28 June 1989, 1♀, net, leg. B. Sagvolden, coll. ZMBN; Loppa: Frakkfjorden, 70.19419°N 21.49484°E, 1997, 1♀, net, leg. H. Rinden, coll. ZMBN.

Remarks. The species has a Holarctic distribution (Aspöck *et al.* 1980, Norman *et al.* 1997). It is distributed in most parts of Europe north to Fennoscandia and is also taken in Morocco and Israel (Aspöck *et al.* 1980, Aspöck & Aspöck 2012). In Norway it is previously recorded north to Troms (Tjeder 1943). One specimen of this species was barcoded (Table 1).

Micromus paganus (Linnaeus, 1767)

Additional material. **FV**, Alta: Kåfjord, Møllnes, 69.94934°N 23.06244°E, 3 July–8

August 1995, 2♂♂, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN; Mattisdalen south, 69.95956°N 23.40562°E, 23 June–4 August 1996, 3♂♂2♀♀, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN.

Remarks. The species is widely distributed in the Palaearctic region, from Europe east to the Kuril Islands and Japan (Aspöck *et al.* 1980). In Norway it is previously recorded north to Alta in Finnmark (Tjeder 1943).

Symphorobius fuscescens (Wallengren, 1863)

Additional material. **FØ**, Sør-Varanger: Svanvik, Svanhovd, 69.45644°N 30.05056°E, 20 June–4 August 1986, 1♀, Malaise trap, leg. F. Midtgaard, coll. ZMBN.

Remarks. The species is widely distributed in the Palaearctic region, from Europe east to Japan (Aspöck *et al.* 1980). In Norway it is previously recorded north to Nordland (Tjeder 1943).

Wesmaelius concinnus (Stephens, 1836)

Material. FinLoc56, 26 July–25 August 2010, 1♂, Malaise trap.

Additional material. **FI**, Karasjok: Karasjok, 69.47025°N 25.50783°E, 14–15 July 1947, 2♂♂, net, leg. A. Tjønneland & N. Lønøy, coll. ZMBN.

Remarks. The species is distributed in most parts of Europe north to Fennoscandia and is also taken in Georgia (Aspöck *et al.* 1980, Aspöck & Aspöck 2012). In Norway it is previously recorded north to Troms (Tjeder 1943). One specimen of this species was barcoded (Table 1).

Wesmaelius malladai (Navás, 1925)

Syn.: *Boriomyia mortoni* auct. scand., nec McLachlan, 1899

Additional material. **FV**, Alta: Bosekop, 69.96034°N 23.23470°E, July 1901, 1♂, leg. E. Strand, coll. NHMO; Detsika, Buolamalia, 69.86255°N 23.33996°E, 24 June–16 July 1996, 25♂♂3♀♀; 6 August–25 September 1996, 1♂, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN; Eiby, Valsetmoen, 69.89373°N 23.22674°E, 6 July–8 August 1995, 1♂1♀, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN; Elvebakken, 69.97855°N 23.33670°E, 8 July 1995, 1♂, net, leg. K. Berggren, coll. ZMBN; Elvestrand, 69.95189°N 23.26481°E,

4 July–18 August 1997, 1♂3♀♀, Malaise trap, leg. H. Rinden, coll. ZMBN; Gargia, 69.80596°N 23.50197°E, 22 June–6 August 1996, 33♂♂29♀♀, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN; Kåfjord, 69.93000°N 23.02867°E, July 1901, 2♂♂, leg. E. Strand, coll. NHMO; Kåfjord, Møllnes, 69.94934°N 23.06244°E, 3 July–8 August 1995, 5♂♂10♀♀; 21 June–4 August 1996, 6♀♀; 4 August–25 September 1996, 1♀, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN; Mattisdalen south, 69.95956°N 23.40562°E, 23 June–4 August 1996, 28♂♂26♀♀; 4 August–26 September 1996, 7♂♂2♀♀, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN; Sopnes, 70.05566°N 22.35255°E, July 1901, 1♂, leg. E. Strand, coll. NHMO; Kvalsund: Fægffjord, 70.47851°N 24.21404°E, 8 July 1995, 1♂, net, leg. K. Berggren, coll. ZMBN; Loppa: Frakkfjorden, 70.19419°N 21.49484°E, 1997, 2♀♀, net, leg. H. Rinden, coll. ZMBN; FN, Gamvik: Mehann, 71.01298°N 27.83555°E, 7 July 1986, 1♂, net, leg. G.E.E. Søli, coll. ZMBN.

Remarks. The species is distributed in most parts of Europe north to Fennoscandia and is also reported from Georgia (Aspöck *et al.* 1980, Aspöck & Aspöck 2012). Tjeder (1943) recorded the species, as *Boriomyia mortoni*, from several localities in Finnmark.

Wesmaelius mortoni (McLachlan, 1899)

Additional material. FV, Alta: Elvebakken, 69.97855°N 23.33670°E, 4 July 1979, 2♀♀, net, leg. L. Greve, coll. ZMBN; FI, Karasjok: Karasjok, 69.47025°N 25.50783°E, 14 July 1947, 1♀, net, leg. A. Tjønneland & N. Lønøy, coll. ZMBN.

Remarks. The species is distributed in most parts of Europe north to Fennoscandia and is also reported from Georgia (Aspöck *et al.* 1980, Aspöck & Aspöck 2012). In Norway the species is previously recorded from Dombås in northern Oppland (Kimmins 1963).

Wesmaelius nervosus (Fabricius, 1793)

Material. FinLoc10, 29 July 2010, 1♂, net. FinLoc55, 26 July 2010, 1♀, net. FinLoc 67, 30 July 2010, 1♀, net. FinLoc68, 31 July 2010, 1♀, net. FinLoc85, 19 June 2010, 1♂, net. FinLoc106, 29 July 2010, 1♀, net.

Additional material. FV, Alta: Detsika, Buolamalia, 69.86255°N 23.33996°E, 24 June–16 July 1996, 1♀, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN; Gargia, 69.80596°N 23.50197°E, 1 July 1979, 2♂♂1♀, net, leg. L. Greve, coll. ZMBN; Grønnåsen, 69.79674°N 23.53243°E, 30 June 1979, 1♀, net, leg. L. Greve, coll. ZMBN; Kåfjord, Møllnes, 69.94934°N 23.06244°E, 4 August–25 September 1996, 1♀, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN; Mattisdalen south, 69.95956°N 23.40562°E, 4 August–25 September 1996, 1♀, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN; Aavangen, 69.83820°N 39766°E, 28 June 1979, 1♀, net, leg. L. Greve, coll. ZMBN; FI, Kautokeino: Gievdnevuohppi, 69.20712°N 23.58326°E, 19 June 1986, 1♀, net, leg. A. Fjellberg & F. Midtgaard, coll. UMTN; Kautokeino, 69.00281°N 23.04822°E, 1 July 1989, 1♂3♀♀, net, leg. A. Fjellberg, coll. UMTN; FN, Berlevåg: Berlevåg, 70.85141°N 29.09276°E, 3 July 2002, 1♂, net, leg. T.R. Nielsen, coll. ZMBN; FØ, Sør-Varanger: Svanvik, Mellesmo, 69.45375°N 30.06198°E, 20 June–4 August 1989, 1♂, Malaise trap, leg. F. Midtgaard, coll. ZMBN; Øvre Pasvik, Gjøkbukta, 69.15811°N 29.22185°E, 16 July 1966, 1♂, net, leg. A. Lillehammer, coll. NHMO; Øvre Pasvik, Gjøkåsen, 69.15285°N 29.18808°E, 17 July 1989, 1♀, net, leg. T.R. Nielsen, coll. ZMBN; Øvre Pasvik, Noatun, 69.16532°N 29.24579°E, 7–15 August 1989, 2♀♀, Malaise trap, leg. T.R. Nielsen, coll. ZMBN; Øvre Pasvik, Nyrud, 69.14633°N 29.24402°E, 10 July 1966, 1♀; 12 July 1966, 1♀, net, leg. A. Lillehammer, coll. NHMO; Øvre Pasvik, Vaggatem, 69.21385°N 29.15538°E, 16 July 1978, 1♀, net, leg. K. Rognes, coll. ZMBN.

Remarks. The species has a Holarctic distribution (Aspöck *et al.* 1980, Norman *et al.* 1997). It is distributed all over Europe north to Fennoscandia (Aspöck & Aspöck 2012). In Norway it is previously recorded north to Karasjok in Finnmark (Tjeder 1943). Two specimens of this species were barcoded (Table 1).

Wesmaelius quadrifasciatus (Reuter, 1894)

Additional material. FV, Alta: Detsika, Buolamalia, 69.86255°N 23.33996°E, 8 August–10

September 1995, 1♂, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN.

Remarks. The species is distributed in most parts of Europe north to Fennoscandia and is also reported from Georgia (Aspöck *et al.* 1980, Aspöck & Aspöck 2012). In Norway it is previously recorded north to Nordland (Tjeder 1943).

CHRYSOPIDAE

Chrysoperla carnea (Stephens, 1836)

Additional material. FV, Alta: Kåfjord, Møllnes, 69.94934°N 23.06244°E, 21 June–4 August 1995, 1♀, Malaise trap, leg. L.O. Hansen & H. Rinden, coll. ZMBN; FI, Karasjok: Buddasnjarga, 69.371598°N 25.813463°E, 5 July 1995, 1♀, net, leg. K. Berggren & K. Myhr, coll. ZMBN; FN, Vadsø: Vadsø, 70.08121°N 29.74332°E, 9–10 July 1983, 1♀, Malaise trap, leg. T.R. Nielsen, coll. ZMBN.

Remarks. The species has long been regarded as an anthropochore cosmopolite (see Aspöck *et al.* 1980). However, it is now generally regarded to be a complex of several cryptic species indistinguishable from each other morphologically, but distinguished by variations in the vibrational songs the insects use to communicate with each other during courtship (see Henry *et al.* 2002). *Chrysoperla carnea* s.l. is not recorded for northern Norway by Tjeder (1943).

SISYRIDAE

Sisyra nigra (Retzius, 1793)

Syn.: *S. fuscata* (Fabricius, 1793)

Material. FinLoc19, 25 June–9 July 2010, 8♂♂; 9–24 July 2010, 4♂♂; 24 July–6 August 2010, 4♂♂, Malaise trap. FinLoc21, 12–25 June 2010, 1♂; 25 June–9 July 2010, 21♂♂; 9–24 July 2010, 1♂; 24 July–6 August 2010, 3♂♂, Malaise trap. FinLoc65, 19–24 June 2010, 26♂♂1♀; 24 June–20 July 2010, 200♂♂2♀♀; 20–30 July 2010, 21♂♂, Malaise trap; 19 June 2010, 1♂; 31 July 2010, 1♂, net. FinLoc69, 19 June 2010, 1♂, net. FinLoc81, 24 June–20 July 2010, 1♂, Malaise trap.

Additional material. FØ, Sør-Varanger: Øvre Pasvik, Sortbrysttjern, 69.15962°N 28.97643°E,

5 July 1974, 1♂1♀, sweep net, leg. A. Fjellberg, coll. ZMBN.

Remarks. The species is distributed all over Europe north to Fennoscandia (Aspöck & Aspöck 2012). In Norway it is previously recorded northwards to eastern Finnmark (Greve 1996b). One specimen of this species was barcoded (Table 1).

MEGALOPTERA

SIALIDAE

Sialis fuliginosa Pictet, 1836

Material. FinLoc05, 26 June–10 July 2010, 1♂, Malaise trap. FinLoc08, 26 June–10 July 2010, 3♂♂; 10–23 July 2010, 1♂2♀♀, Malaise trap. FinLoc21, 25 June–9 July 2010, 1♂, Malaise trap. FinLoc56, 2–17 July 2010, 1♀, Malaise trap. FinLoc81, 24 June–20 July 2010, 1♂1♀, Malaise trap.

Additional material. FV, Alta: Elvebakken, 69.96914°N 23.37476°E, 5 July 1979, 1♂, net, leg. T.R. Nielsen, coll. ZMBN; FN, Porsanger: Øvre Glattfiskvatn, 70.33789°N 25.51398°E, 24 August 2011, 1juv., bar sieve, leg. K.M. Olsen & J.T. Klepsland, det. K.M. Olsen, coll. NHMO; FØ, Sør-Varanger: Øvre Pasvik, Gjøkbukta, 69.15811°N 29.22185°E, 10 July 1966, 2♂♂1♀, net, leg. A. Lillehammer, coll. NHMO; Øvre Pasvik, Ivargammevatn, 69.15012°N 28.86443°E, 4 July 1966, 1♂1♀, net, leg. A. Lillehammer, coll. NHMO.

Remarks. The species is found in several European countries north to Fennoscandia (Aspöck & Aspöck 2012). In Norway it is previously recorded northwards to eastern Finnmark (Greve 1996a). Two specimens of this species were barcoded (Table 1).

Sialis morio Klingstedt, 1932

Material. FinLoc19, 12–25 June 2010, 1♂; 25 June–9 July 2010, 21♂♂1♀, Malaise trap. FinLoc21, 25 June–9 July 2010, 11♂♂1♀, Malaise trap. FinLoc92, 19 June 2010, 1♂, net.

Additional material. FI, Kautokeino: Kautokeino, 69.00281°N 23.04822°E, 27 July 1955, 1♂, net, leg. E. Sivertsen, coll. VMTN;

Sullomašluoppal, 68.90890°N 23.10488°E, 18 June 1986, 1♀, net, leg. A. Fjellberg & F. Midtgaard, coll. UMTN; Suolovuopmi, 69.58657°N 23.52802°E, 12–17 July 1993, 1♂1♀, Malaise trap, leg. A. Nilssen, coll. UMTN; Vuottašjavri, 69.06291°N 24.18620°E, 9 July 1985, 1♂, net, leg. A. Fjellberg, coll. UMTN; **FØ**, Sør-Varanger: Øvre Pasvik, Ellenelva, lower parts, 69.21334°N 29.14162°E, 7 July 1966, 1♀, net, leg. A. Lillehammer, coll. NHMO; Øvre Pasvik, Ellenvatn, 69.11960°N 28.90504°E, 29–30 June 1966, 3♂♂2♀♀, net, leg. A. Lillehammer, coll. NHMO; Øvre Pasvik, Emanuelbekken, 69.30428°N 29.25199°E, 25 June 1990, 1♂, net, leg. T.R. Nielsen, coll. ZMBN; Øvre Pasvik, Juomisjärvi (Fiskevatn), 69.33577°N 29.14619°E, 25 June 1966, 1♂, net, leg. A. Lillehammer, coll. NHMO; Øvre Pasvik, Fiskevatnet, 69.07897°N 29.07226°E, 14 July 1969, 2♀♀, net, leg. T.R. Nielsen, coll. ZMBN; Øvre Pasvik, Gjøkvatnet, 69.15260°N 29.09848°E, 10 July 1990, 1♂2♀♀, net, leg. T.R. Nielsen, coll. ZMBN; Øvre Pasvik, Gjøkåsen, 69.15285°N 29.18808°E, 20 June 1990, 1♂, net, leg. T.R. Nielsen, coll. ZMBN; Øvre Pasvik, Noatun, 69.16532°N 29.24579°E, 22 June 1990, 1♀, net, leg. T.R. Nielsen, coll. ZMBN; Øvre Pasvik, Nyrud, 69.14633°N 29.24402°E, 12 July 1966, 1♂2♀♀, net, leg. A. Lillehammer, coll. NHMO; Øvre Pasvik, Svanvold, 69.21605°N 29.29388°E, 15 July 1966, 1♂, in window, leg. A. Lillehammer, coll. NHMO.

Remarks. The species is distributed in Croatia, Hungary, Italy, Romania, Caucasus and Asian Turkey and from Fennoscandia eastwards to arctic Siberia (Aspöck & Aspöck 2012, Aspöck *et al.* 1980). In Norway the species is previously recorded from Troms and Finnmark (Greve 1996a). One specimen of this species was barcoded (Table 1).

Sialis sibirica McLachlan, 1872

Material. FinLoc21, 25 June–9 July 2010, 1♂1♀, Malaise trap.

Additional material. **FN**, Tana: Rustekjos, 70.66995°N 28.16400°E, 1 August 1960, 3juv., bar sieve, leg. J. Økland, det. K.M. Olsen, coll. NHMO.

Remarks. The species has a Palaearctic

distribution from northern Fennoscandia eastwards through Siberia to Amur, Sakhalin, the Kuril Islands and Japan (Aspöck *et al.* 1980, Hayashi & Suda 1995). It is regarded as a rare species in Fennoscandia (Greve 1996a, Meinander 1962) and is listed as Data Deficient (DD) in the 2010 Norwegian Red List for Species (Gammelmo *et al.* 2010). One specimen of this species was barcoded (Table 1).

Sialis sordida Klingstedt, 1932

Material. FinLoc19, 9–24 July 2010, 1♂, Malaise trap. FinLoc21, 25 June–9 July 2010, 7♂♂, Malaise trap. FinLoc69, 19 June 2010, 1♂, net.

Additional material. **FV**, Alta: Leirbotnvatnet, 70.11129°N 23.56597°E, 14 August 1960, 3juv., bar sieve, leg. J. Økland, det. K.M. Olsen, coll. NHMO; **FI**, Kautokeino: Biggeluobbal, 69.37°N 29.44°E, 26 July 1960, 4juv., bar sieve, leg. J. Økland, det. K.M. Olsen, coll. NHMO; Karasjok: Nattvatn, 69.63°N 25.30°E, 10 August 1960, 1juv., bar sieve, leg. J. Økland, det. K.M. Olsen, coll. NHMO; Jeambealesnjargga, 69.43972°N 25.65228°E, 11 August 1960, 1juv., bar sieve, leg. J. Økland, det. K.M. Olsen, coll. NHMO; Karasjok, 69.47025°N 25.50783°E, 7 July 1977, 1♂, net, leg. I. & T.R. Nielsen, coll. ZMBN; **FN**, Porsanger: Kivijärvi, 70.32977°N 25.48232°E, 23 August 2011, 1juv., bar sieve, leg. K.M. Olsen & J.T. Klepsland, det. & coll. K.M. Olsen; Nedrevatn, 69.89°N 24.96°E, 10 August 1960, 4juv., bar sieve, leg. J. Økland, det. K.M. Olsen, coll. NHMO; Smørfjordvann, 70.46°N 24.74°E, 13 August 1960, 1juv., bar sieve, leg. J. Økland, det. K.M. Olsen, coll. NHMO; **FØ**, Sør-Varanger: Pikevatnet, 69.66248°N 30.19394°E, 2 August 1960, 1juv., bar sieve, leg. J. Økland, det. K.M. Olsen, coll. NHMO; Skrotnes (Skrotynes), 69.42516°N 29.99481°E, 20 June 2002, 1♂, net, leg. T.R. Nielsen, coll. ZMBN; Svanvatn, 69.45133°N 30.03284°E, 4 August 1960, 5juv., bar sieve, leg. J. Økland, det. K.M. Olsen, coll. NHMO; Vaggatem, 69.24904°N 29.24218°E, 5 August 1960, 4juv., bar sieve, leg. J. Økland, det. K.M. Olsen, coll. NHMO.

Remarks. The species is distributed in Germany and Fennoscandia eastwards to northern

Russia (Aspöck & Aspöck 2012, Aspöck *et al.* 1980). In Norway the species has previously been recorded from Troms and Finnmark (Greve 1996a, Yakovlev 2009).

Discussion

Tjeder (1943) recorded six species of Hemerobidae (Neuroptera) and two species of Megaloptera from Finnmark (Table 2). Greve (1996a, b) added one species of Sisyridae (Neuroptera) and three species of Megaloptera, but without giving exact locality information. Further, in her review of the Norwegian Coniopterygidae (Neuroptera) species Greve (1997) recorded three species from Finnmark.

In the present paper we give new records of three species of Coniopterygidae of which *Coniopteryx tineiformis* has not previously been recorded from Finnmark. Of Hemerobidae we give records of 17 species of which *Hemerobius atrifrons*, *H. fenestratus*, *H. humulinus*, *H. marginatus*, *H. nitidulus*, *H. pini*, *Micromus angulatus*, *Symphorobius fuscescens*, *Wesmaelius concinnus*, *W. mortoni* and *W. quadrifasciatus* have not previously been recorded from Finnmark. Of Chrysopidae we give records of one species, *Chrysoperla carnea*, a species which has previously not been recorded from northern Norway. However, today many specialists regard *C. carnea* as a complex of morphologically very similar species and further studies might be necessary to establish the true identity of these specimens. Of Sisyridae we give records of *Sisyra nigra*. The total number of Neuroptera known to occur in Finnmark is now 23 of which four belong in Coniopterygidae, 17 in Hemerobidae, and one in each of the families Chrysopidae and Sisyridae.

Five species of the Megaloptera genus *Sialis* occur in Norway and all have previously been recorded from Finnmark (Greve 1996a). In the present paper we give records of four of these species; for *S. morio* the present records are the first records from Finnmark with exact locality information. *Sialis sibirica* is listed as Data Deficient (DD) in the 2010 Norwegian Red List for Species based on a few records from Troms

and Finnmark (Gammelmo *et al.* 2010).

The field work in Finnmark in 2010 focused on insects inhabiting freshwater and humid habitats (see Ekrem *et al.* 2012). Only species of the Neuroptera family Sisyridae and the Megaloptera have aquatic larvae while most of the Neuroptera species are terrestrial. Even so, 13 species of Neuroptera and four species of Megaloptera were collected during the field work in 2010. The records of the remaining 10 species of Neuroptera are based solely on material housed in the collections at the University Museum of Bergen; the Natural History Museum, Oslo; The Museum of Natural History and Archaeology, Trondheim and in Tromsø University Museum. Neuroptera is regarded as one of the better studied insect groups in Norway (Aagaard 2011). Even so the present study more than doubles the number of species known from Finnmark and following Strand's system (Økland 1981) we add 41 new regional records for Finnmark. The present paper thus emphasizes the importance of systematic surveys to increase our knowledge on the occurrence of even comparatively well studied insect groups in Norway.

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References

- Aagaard, K. 2011. *Artsmangfoldet i Norge - en kunnskapsoversikt anno 2011*. Utredning for Artsdatabanken 1/2011: 1–47. Artsdatabanken, Norge.
- Aagaard, K. & Dolmen, D. (Eds). 1996. *Limnofauna Norvegica. Katalog over norsk ferskvannsfåuna*. 310 pp. Tapir, Trondheim.
- Artsdatabanken. 2012. *Artskart 1.6*. Artsdatabanken & GBIF-Norge. [Available from: <http://artskart.artsdatabanken.no/default.aspx>] (14 October 2012).
- Aspöck, U. & Aspöck, H. (Eds). 2012. *Neuropteroid orders*. Fauna Europaea version 2.5. [Available

TABLE 2. Distribution of Neuroptera and Megaloptera in Finnmark based on the revised Strand-system (Økland 1981). For previously published records the publications or source are referred to by numbers as follows: ¹Tjeder (1943), ²Greve (1997), ³Greve (1996b), ⁴Greve (1996a), ⁵Artskart (2012).

| Species | FV | FI | FN | FØ |
|---|----------------|------------------|--------------------|----------------|
| NEUROPTERA | | | | |
| Coniopterygidae | | | | |
| <i>Coniopteryx pygmaea</i> Enderlein, 1906 | x ² | | | |
| <i>Coniopteryx tineiformis</i> Curtis, 1834 | | | | x |
| <i>Conwentzia pineticola</i> Enderlein, 1905 | x ² | | | |
| <i>Helicoconis lutea</i> (Wallengren, 1871) | x ² | | x ² | x ² |
| Hemerobidae | | | | |
| <i>Hemerobius atrifrons</i> McLachlan, 1868 | x | | x | |
| <i>Hemerobius fenestratus</i> Tjeder, 1932 | | | | x |
| <i>Hemerobius humulinus</i> Linnaeus, 1758 | | x | x | |
| <i>Hemerobius marginatus</i> Stephens, 1836 | x | x | x | x |
| <i>Hemerobius nitidulus</i> Fabricius, 1777 | x | | | x |
| <i>Hemerobius perelegans</i> Stephens, 1836 | x | x ¹ | x | x |
| <i>Hemerobius pini</i> Stephens, 1836 | x | x | | |
| <i>Hemerobius simulans</i> Walker, 1853 | x | | | x ¹ |
| <i>Hemerobius stigma</i> Stephens, 1836 | x | x ¹ | x | x |
| <i>Micromus angulatus</i> (Stephens, 1836) | x | | x | x |
| <i>Micromus paganus</i> (Linnaeus, 1767) | x ¹ | | | |
| <i>Symphorobius fuscescens</i> (Wallengren, 1863) | | | | x |
| <i>Wesmaelius concinnus</i> (Stephens, 1836) | | x | x | |
| <i>Wesmaelius malladai</i> (Návas, 1925) | x ¹ | x ¹ | | |
| <i>Wesmaelius mortoni</i> (McLachlan, 1899) | x | | x | |
| <i>Wesmaelius nervosus</i> (Fabricius, 1793) | x | x ¹ | x | x |
| <i>Wesmaelius quadrifasciatus</i> (Reuter, 1894) | x | | | |
| Chrysopidae | | | | |
| <i>Chrysoperla carnea</i> (Stephens, 1836) | x | x | x | |
| Sisyridae | | | | |
| <i>Sisyra nigra</i> (Retzius, 1783) | x | x | | x ⁴ |
| MEGALOPTERA | | | | |
| <i>Sialis fuliginosa</i> Pictet, 1836 | x ³ | x ^{1,2} | x ⁵ | x ³ |
| <i>Sialis lutaria</i> (Linnaeus, 1758) | | x ¹ | | |
| <i>Sialis morio</i> Klingstedt, 1932 | | x ³ | | x ³ |
| <i>Sialis sibirica</i> McLachlan, 1872 | | x | x ^{1,3,5} | |
| <i>Sialis sordida</i> Klingstedt, 1932 | | x ³ | x ⁵ | x |

- from: <http://www.faunaeur.org/> (14 October 2012).
- Aspöck, H., Aspöck, U. & Hölzel, H. 1980. *Die Neuropteren Europas. Eine zusammenfassende Dartstellung der Systematik, Ökologie und Chorologie der Neuropteroidea (Megaloptera, Raphidioptera, Planipennia) Europas. Vol. I & II.* 495 + 355 pp. Goecke & Evers, Krefeld.
- Ekrem, T., Roth, S., Andersen, T., Stur, E., Søli, G. & Halvorsen, G.A. 2012. Insects inhabiting freshwater and humid habitats in Finnmark, northern Norway. *Norwegian Journal of Entomology* 59, 91–107.
- Esben-Petersen, P. 1902. Bidrag til en fortegnelse over arktisk Norges Neuropterfauna. (With description of a new species of Ephemeroidea by Rev. A. E. Eaton). *Tromsø Museums Aarshefter* 25, 119–153.
- Esben-Petersen, P. 1910. Bidrag til en fortegnelse over arktisk Norges Neuropterfauna. II. *Tromsø Museums Aarshefter* 31–32 (1908–1909), 75–89.
- Gammelmo, Ø., Olsen, K.M., Hansen, L.O. & Greve, L. 2010. *Nebbflyer, kamelhalsflyer, mudderflyer og nettvinger: Mecoptera, Raphidioptera, Megaloptera, Neuroptera.* Pp. 251–256 in Kålås, J. A., Viken, Å., Henriksen, S. & Skjelseth, S. (Eds), The 2010 Norwegian Red List for Species. Norwegian Biodiversity Information Centre, Norway.
- Greve, L. 1976. *Hemerobius fenestratus* Tjeder, 1932 (Neuroptera, Planipennia) new to Norway. *Norwegian Journal of Entomology* 32, 92.
- Greve, L. 1996a. *Megaloptera Mudderflyer.* Pp. 168–169 in Aagaard, K. & Dolmen, D. (Eds), *Limnofauna Norvegica. Katalog over norsk ferskvannsfåuna.* Tapir, Trondheim.
- Greve, L. 1996b. *Neuroptera Planipennia Nettvinger.* Pp. 170–171 in Aagaard, K. & Dolmen, D. (Eds), *Limnofauna Norvegica. Katalog over norsk ferskvannsfåuna.* Tapir, Trondheim.
- Greve, L. 1997. The family Coniopterygidae (Neuroptera) in Norway. *Fauna norvegica, Serie B* 44, 143–157.
- Hayashi, F. & Suda, S. 1995. Sialidae (Megaloptera) of Japan. *Aquatic Insects* 17, 1–15.
- Henry, C.S., Brooks, S.J., Duelli, P. & Johnson, J. B. 2002. Discovering the true *Chrysoperla carnea* (Insecta: Neuroptera: Chrysopidae) using song analysis, morphology, and ecology. *Annals of the Entomological Society of America* 95, 172–191.
- Kimmins, D.E. 1963. Notes on two British species of Neuroptera (*Boriomyia mortoni* (McL) and *B. killington* (Morton)), with a description of a new species in the *mortoni* group of *Boriomyia*. *Entomologist's Gazette* 14, 140–149.
- Makarkin, V.N. & Monserrat, V.J. 2007. Notes on the identity of *Hemerobius amurensis* Navás, 1929 (Neuroptera, Hemerobidae). *Deutsche Entomologische Zeitschrift* 54, 267–270.
- McLachlan, R. 1899. Trichoptera, Planipennia, and Pseudo-Neuroptera, collected in Finnmark in 1898 by Dr. T.A. Chapman and Mr. R.W. Lloyd. *Entomologist's Monthly Magazine* 35, 28–30.
- Meinander, M. 1962. The Neuroptera and Mecoptera of eastern Fennoscandia. *Fauna Fennica* 13, 1–96.
- Norman, P.D., Adams, P.A. & Stange, L.A. 1997. Species catalog of the Neuroptera, Megaloptera, and Raphidioptera of America north of Mexico. *Proceedings of the California Academy of Sciences* 50(3), 39–114.
- Tjeder, B. 1943. The Neuroptera and Mecoptera of Northern Norway (Nordland, Troms and Finnmark). *Tromsø Museums Årshefter, Naturhistorisk Avdeling* 25. 63(3) (1940), 3–15.
- Yakovlev, V.A. 2009. The fauna and distribution of Alderfly larvae (Sialidae, Megaloptera) in Northern Fennoscandia and its dependence on natural and anthropogenous factors. *Inland Water Biology* 2, 193–198.
- Økland, K.A. 1981. Inndeling av Norge til bruk ved biogeografiske oppgaver - et revidert Strand-system. *Fauna* 34, 167–178.

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