

# Hoverflies (Diptera, Syrphidae) in North Norway

TOR RANDULFF NIELSEN & SVEIN SVENDSEN

Nielsen, T.R. & Svendsen, S. 2014. Hoverflies (Diptera, Syrphidae) in North Norway. *Norwegian Journal of Entomology* 61, 119–134.

225 hoverfly species and 53 genera have been recorded from North Norway. Examination of northern type material has revealed three synonyms: *Eristalis corymbus* Violovitsh, 1975 = *E. fratercula* (Zetterstedt, 1838), *Platycheirus rarus* Violovitsh, 1978 = *P. manicatus* (Meigen, 1822) and *Melangyna stackelbergi* Violovitsh, 1980 = *M. coei* Nielsen, 1971, all new synonyms. *P. urakawensis* (Matsumura, 1919) is reported new to the Norwegian fauna. The unknown larva of *Eristalis fratercula* was hatched from eggs and figured.

Key words: Diptera, Syrphidae, taxonomy, new synonyms, distribution, ecology, North Norway.

Tore R. Nielsen, Sandvedhagen 8, NO-4318 Sandnes, Norway. E-mail: [tore@nielsen.cc](mailto:tore@nielsen.cc)

Svein Svendsen, Nordåsvegen 34, NO-4760 Birkeland, Norway. E-mail: [svein.svendsen@losmail.no](mailto:svein.svendsen@losmail.no)

## Introduction

North Norway comprises the counties Nordland, Troms and Finnmark, from about 65° northern latitude, e.g. north of Trondheim.

As in other parts of West Europe the climate and vegetation of North Norway is much influenced by the Gulf Stream, giving a cold temperate climate in the coastal areas. The climate of the interior and northernmost parts is of the mountain and polar type. Innermost parts of Finnmark and Troms have continental conditions with less snow and strong frost in winter, but may have dry and warm summers, often influenced by southern winds from Finland and Russia.

Tundra (Figures 1–2) is the main vegetation type along the coast and in the mountains, gradually changing into birch (*Betula*) scrub and deciduous thickets in the fjords and inland. Taiga vegetation (Figure 3), much dominated by pine (*Pinus*), is present in eastern part of county Finnmark, mainly in the Pasvik valley and in Karasjok, but also in the inland valleys of Troms. Further details of topography and climate are

given by Moen (1998).

Bidenkap (1900) was the first to publish on syrphids from North Norway (in coll. Tromsø Museum), reporting on 61 species names. Some of the names could not be verified as the material probably has been lost.

Later on hoverfly material from North Norway has been reported in a series of publications: Nielsen (1974–2008), Mazánek *et al.* (1999, 2004), Nielsen & Claussen (2001), Gammelmo & Nielsen (2008) and Bartsch *et al.* 2009 a, b.

## Material and methods

The material for this paper is mainly from our own collecting trips: the first author in 1969, 1977, 1981, 1983, 1984, 1990, 1999, 2002, 2005, 2006 and 2008, the second author in 2006, 2007, 2010 and 2011. In addition we have had the possibility to include material from the collections of Tromsø Museum, Helgeland Museum, Bergen Museum and Natural History Museum Oslo. Andreas Tore Andreassen, Borlaug supported us with valuable

material from northern Finnmark.

The material has mainly been collected by hand-netting and Malaise-traps. On some occasions yellow water traps were used, especially on peat bogs and river banks with few flowers. Visits to farms or areas with ditches and outdoor heaps of cow and horse manure often gave successful collecting of *Eristalis*, *Helophilus*, *Neoascia* and *Sericomyia* material. See Figure



FIGURE 1. Tundra at Slettnes on the northern coast of Finnmark (EIS 188) July 2011. Photo S. Svendsen.



FIGURE 2. From Gamvik, Finnmark, 2012. A surprising collecting site for *Baccha elongata*. Photo S. Svendsen.



FIGURE 3. Taiga, bog and dystrophic lake. Gjøkåsen, Pasvik 24 June 1990. Photo TRN.

4. – Visiting mountain tops on sunny days sometimes proved successfully, “hill topping” is a phenomenon also known to occur with hoverflies.

## Results

225 hoverfly species and 53 genera have been found in the area (Table 1).

**Synonymy.** During our study of the North Norwegian hoverfly fauna we have checked the identity of three actual Russian species names, *Eristalis corymbus* Violovitsh, 1975, *Platycheirus rarus* Violovitsh, 1978 and *Melangyna stackelbergi* Violovitsh, 1980. The first author examined the types in coll. Zoological Institute, St. Petersburg (ZISP) and found

*Eristalis corymbus* Violovitsh, 1975 male holotype dated “Peninsula Yamal, Shchuch’ya River basin” is synonymous with *E. fratercula*



FIGURE 4. Ditch with cow manure and *Eristalis gomojunovae* males patrolling to and fro. Vaggetem, Pasvik (EIS 160) 23 June 1990. Photo TRN.

**TABLE 1.** Species records from different EIS-squares. EIS numbers (see E-grid map of Norway at the end of the volume).

Species	EIS
<i>Anasimyia interpuncta</i> (Harris, 1776)	154, 169
<i>A. lineata</i> (Fabricius, 1787)	93, 138, 139, 160
<i>A. lunulata</i> (Meigen, 1822)	154, 159, 160, 169
<i>Arctophila bombiformis</i> (Fallén, 1810)	102, 107
<i>Baccha elongata</i> (Fabricius, 1775)	101, 110, 114, 115, 118, 122, 123, 130, 131, 137, 146, 154, 165, 169, 181, 188
<i>Blera fallax</i> (Linnaeus, 1758)	107, 115, 123
<i>Brachyopa cinerea</i> Wahlberg, 1844	146, 160, 162
<i>B. dorsata</i> Zetterstedt, 1838	103, 107, 108, 111, 123, 154, 160, 165, 168
<i>B. obscura</i> Thompson & Torp, 1982	103
<i>B. testacea</i> (Fallén, 1817)	103, 107, 115, 160
<i>B. vittata</i> Zetterstedt, 1843	108
<i>Chalcosyrphus jacobsoni</i> (Stackelberg, 1921)	165
<i>C. nemorum</i> (Fabricius, 1805)	160, 169
<i>C. piger</i> (Fabricius, 1794)	160
<i>C. valgus</i> (Gmelin, 1790)	154, 160, 165, 169, 173
<i>Cheilosia albitarsis</i> (Meigen, 1822)	101, 103, 106, 107, 111, 114, 115, 117, 122, 123, 127, 130, 131, 134, 143, 146, 147, 154, 155, 160, 162, 165, 169, 170, 173, 181
<i>C. alpina</i> (Zetterstedt, 1838)	178, 184, 188
<i>C. angustigenis</i> (Becker, 1894)	123, 160, 168
<i>C. carbonaria</i> Egger, 1860	134, 146, 147, 154, 162
<i>C. chrysocoma</i> (Meigen, 1822)	130, 147, 162, 178, 184, 185, 188
<i>C. flavissima</i> Becker, 1894	169
<i>C. frontalis</i> Loew, 1857	111, 117, 118, 123, 124, 130, 134, 146, 154, 155, 162
<i>C. gigantea</i> (Zetterstedt, 1838)	103, 110, 114, 115, 117, 123, 127, 130, 131, 133, 134, 137, 138, 146, 147, 154, 155, 157, 160, 162, 164, 165, 166, 167, 168, 169, 173, 174, 176, 177, 181, 182, 184, 186
<i>C. ingerae</i> Nielsen & Claussen, 2001	110, 115, 126, 127, 131, 146, 147, 155, 160, 165, 168, 169, 173, 176, 184
<i>C. latifrons</i> (Zetterstedt, 1843)	111, 115, 123, 127, 130, 131, 134, 138, 146, 154, 160, 162, 173, 181, 182, 184, 187, 188, 189
<i>C. longula</i> (Zetterstedt, 1838)	160
<i>C. aff. longula</i> (Zetterstedt, 1838)	104, 111, 115, 116, 123, 127, 131, 134, 138, 139, 144, 146, 147, 154, 155, 157, 158, 159, 160, 162, 164, 165, 166, 167, 168, 169, 170, 173, 174, 175, 176, 177, 179, 180, 181, 182, 183, 184
<i>C. melanopa</i> (Zetterstedt, 1843)	119, 123, 147, 149, 154, 156, 157, 165, 166, 168, 172, 173, 174, 177, 181, 184, 187, 188, 189
<i>C. mutabilis</i> (Fallén, 1817)	114
<i>C. naruska</i> Haarto & Kerppola, 2007	168, 169
<i>C. pagana</i> (Meigen, 1822)	101, 111, 114, 117, 122, 127, 129, 130, 134, 137, 138, 146, 153, 154, 156, 160, 162, 164, 166, 168, 169, 170, 171, 173, 176, 177, 178, 181, 182, 184, 185, 188, 189

TABLE 1. continued

Species	EIS
<i>C. pubera</i> (Zetterstedt, 1838)	115, 117, 123, 130, 131, 146, 152, 154, 160, 162, 165, 166, 167, 168, 169, 176, 181, 184, 188
<i>C. rufimana</i> (Becker, 1894)	123
<i>C. sahlbergi</i> (Becker, 1894)	127, 157, 159, 160, 162, 167, 173, 174, 177, 181, 182, 187, 187, 188
<i>C. scutellata</i> (Fallén, 1817)	146
<i>C. semifasciata</i> (Becker, 1894)	130, 170, 171, 188
<i>C. sootryeni</i> Nielsen, 1970	118, 123, 124, 127, 130, 134, 138, 146, 160, 162, 164, 165, 169, 181, 182
<i>C. uviformis</i> (Becker, 1894)	123, 127, 130, 134, 146, 166, 169
<i>C. vernalis</i> (Fallén, 1817)	123, 124, 127, 134, 137, 146, 153, 154, 157, 160, 162, 165, 168, 169, 170, 173, 174, 178, 181, 184, 185, 188, 189
<i>C. vicina</i> (Zetterstedt, 1849)	114, 123, 127, 130, 137, 146, 162, 165, 182
<i>Chrysosyrphus nasutus</i> (Zetterstedt, 1838)	139, 146, 154, 155, 158, 160, 165, 168, 173, 174
<i>C. niger</i> (Zetterstedt, 1843)	149, 158, 160, 165, 168, 174, 176
<i>Chrysotoxum arcuatum</i> (Linnaeus, 1758)	92, 103, 108, 114, 115, 118, 122, 123, 126, 127, 130, 131, 134, 137, 138, 139, 147, 154, 157, 162, 164, 165, 172, 182
<i>C. bicinctum</i> (Linnaeus, 1758)	110, 114, 115, 122, 123, 126
<i>C. fasciolatum</i> (De Geer, 1776)	103, 123
<i>Criorhina asilica</i> (Fallén, 1816)	122, 130, 147
<i>Dasysyrphus albostrigatus</i> (Fallén, 1817)	139, 146, 153, 162, 165, 168, 173, 179
<i>D. hilaris</i> (Zetterstedt, 1843)	130
<i>D. friuliensis</i> (v.d. Goot, 1960)	101, 115, 123, 126, 127, 146, 147, 154, 160, 162, 164, 165, 168, 169, 173, 174, 175, 176, 177, 182, 185
<i>D. nigricornis</i> (Verrall, 1873)	157, 160, 165, 167, 168, 169, 174
<i>D. pauxillus</i> Williston, 1887	111, 123, 127, 146, 154, 160, 164, 165, 167, 169
<i>D. pinastri</i> (De Geer, 1776)	107, 115, 123, 127, 130, 146, 147, 160, 162, 165, 168, 169, 172
<i>D. tricinctus</i> (Fallén, 1817)	101, 110, 115, 127, 134, 139, 155, 162, 165, 168, 169, 172, 173, 174, 176
<i>D. venustus</i> (Meigen, 1822)	110, 127, 130, 131, 147, 160, 165, 169, 173
<i>Didea alneti</i> (Fallén, 1817)	168
<i>D. intermedia</i> Loew, 1854	138, 160
<i>Epistrophe cryptica</i> Doczkal & Schmid, 1994	160
<i>E. melanostoma</i> (Zetterstedt, 1843)	160, 165
<i>E. nitidicollis</i> (Meigen, 1822)	127, 130, 138, 154, 162
<i>E. obscuripes</i> (Strobl, 1909)	127
<i>E. ochrostoma</i> (Zetterstedt, 1849)	160
<i>Epistrophella euchroma</i> (Kowarz, 1885)	130, 146, 160
<i>Episyrphus balteatus</i> (De Geer, 1776)	117, 138, 168, 169
<i>Eristalinus aeneus</i> (Scopoli, 1763)	130
<i>E. sepulchralis</i> (Linnaeus, 1758)	129, 170, 173

TABLE 1. continued

Species	EIS
<i>Eristalis abusiva</i> Collin, 1931	110, 122, 146, 147, 154, 157, 160, 162, 164, 165, 167, 168, 169, 173, 174, 176, 177
<i>E. anthophorina</i> (Fallén, 1817)	111, 123, 125, 127, 136, 137, 146, 154, 155, 157, 160, 162, 164, 165, 167, 168, 169, 173, 174, 176, 177, 182
<i>E. arbustorum</i> (Linnaeus, 1758)	101, 106, 110, 114, 115, 117, 122, 123, 129, 130, 131, 133, 134, 136, 138, 143, 146, 147, 152, 154, 155, 157, 159, 160, 162, 164, 165, 166, 167, 168, 169, 170, 171, 173, 174, 176, 177, 181, 182, 184, 188
<i>E. cryptarum</i> (Fabricius, 1794)	146, 154, 160, 168, 173, 176, 183, 184
<i>E. fratercula</i> (Zetterstedt, 1838)	154, 157, 160, 164, 165, 167, 168, 169, 173, 174, 176, 177, 188
<i>E. gomojunovae</i> Violovitsh, 1977	146, 157, 160, 165, 168, 169, 176
<i>E. hirta</i> Loew, 1866 (syn. <i>tundrarum</i> Frey, 1932)	111, 122, 123, 130, 133, 136, 146, 147, 149, 154, 155, 157, 160, 162, 164, 165, 166, 168, 169, 173, 174, 176, 177, 181, 182, 184, 188
<i>E. interrupta</i> (Poda, 1761)	101, 103, 111, 115, 117, 122, 123, 130, 155, 157, 158, 160, 164, 165, 166, 168, 169, 173, 174, 176, 177, 182, 184
<i>E. intricaria</i> (Linnaeus, 1758)	101, 107, 110, 114, 115, 117, 121, 122, 123, 126, 130, 131, 134, 136, 137, 138, 139, 147, 152, 154, 155, 157, 160, 162, 164, 165, 168, 169, 170, 174, 176, 177, 181, 187, 188
<i>E. obscura</i> Loew, 1866 (syn. <i>pseudorupium</i> Kan.)	117, 138, 154, 155, 157, 160, 164, 165, 166, 168, 169, 174, 177
<i>E. oestracea</i> (Linnaeus, 1758)	160, 168, 169, 174
<i>E. pertinax</i> (Scopoli, 1763)	116, 117, 122, 123, 160, 178, 184
<i>E. picea</i> (Fallén, 1817)	160
<i>E. rupium</i> Fabricius, 1805	101, 106, 110, 114, 115, 117, 122, 123, 127, 130, 131, 137, 139, 146, 147, 154, 155, 157, 160, 162, 164, 165, 168, 169, 171, 173, 174, 176, 178, 182, 183, 184
<i>E. tenax</i> (Linnaeus, 1758)	114, 115, 122, 127, 136, 146, 169, 177
<i>Eupeodes abiskoensis</i> Dušek & Láška, 1973	147, 160, 173, 183
<i>E. biciki</i> Nielsen, 2003	162
<i>E. bucculatus</i> (Rondani, 1857)	127, 130, 131, 138, 146, 154, 160, 162, 163, 164, 165, 173, 177
<i>E. corollae</i> (Fabricius, 1794)	107, 110, 115, 117, 122, 123, 138, 146, 160, 162, 168, 169, 173, 174, 176, 177, 179, 184, 188
<i>E. curtus</i> (Hine, 1922)	146, 160, 165, 169, 174, 188
<i>E. duseki</i> Mazánek, Láška & Bičík, 1998	131, 160, 165, 169, 174
<i>E. goeldlini</i> Mazánek, Láška & Bičík, 1998	165
<i>E. lapponicus</i> (Zetterstedt, 1838)	106, 114, 122, 137, 138, 147, 154, 157, 160, 165, 166, 168, 169, 180, 187
<i>E. latifasciatus</i> (Macquart, 1829)	110, 111, 115, 122, 123, 124, 126, 127, 130, 131, 134, 138, 146, 147, 153, 154, 157, 158, 160, 162, 164, 165, 167, 168, 169, 172, 173, 174, 175, 176, 177, 179, 180, 181, 182
<i>E. lundbecki</i> (Soot-Ryen, 1946)	101, 115, 117, 122, 123, 124, 127, 130, 131, 134, 138, 146, 154, 157, 160, 162, 164, 165, 167, 168, 172, 173, 174, 176, 179, 180, 181, 183, 186

TABLE 1. continued

Species	EIS
<i>E. luniger</i> (Meigen, 1822)	106, 122, 123, 127, 162, 167, 173, 181
<i>E. nielseni</i> (Dušek & Láska, 1976)	111, 124, 127, 139, 153, 154, 160
<i>E. nitens</i> (Zetterstedt, 1843)	110, 122, 123, 131, 154, 160, 165, 173
<i>E. punctifer</i> (Frey, 1934)	119, 123, 127, 138, 149, 154, 157, 160, 163, 164, 165, 168, 169, 172, 173, 174, 175, 176, 177, 179, 181, 182, 184, 187
<i>E. tirolensis</i> (Dušek & Láska, 1973)	154, 172
<i>Ferdinandea cuprea</i> (Scopoli, 1763)	138
<i>Hammerschmidia ferruginea</i> (Fallén, 1817)	127, 160
<i>Helophilus affinis</i> Wahlberg, 1844	123, 159, 160, 165, 166, 168, 169, 174, 176, 177, 183
<i>H. groenlandicus</i> (Fabricius, 1780)	119, 147, 160, 165, 169, 176, 177, 178
<i>H. hybridus</i> Loew, 1846	157, 160, 169, 174, 177, 178
<i>H. lapponicus</i> Wahlberg, 1844	146, 147, 154, 157, 160, 162, 164, 165, 166, 168, 169, 173, 174, 176, 177, 178, 181, 184
<i>H. pendulus</i> (Linnaeus, 1758)	98, 101, 107, 110, 111, 115, 117, 118, 122, 123, 125, 127, 129, 130, 131, 133, 137, 138, 139, 144, 146, 147, 152, 153, 154, 155, 157, 160, 162, 164, 165, 166, 168, 169, 171, 173, 174, 176, 177, 178, 180, 181, 182, 183, 184, 185, 186, 188, 189
<i>Heringia pubescens</i> (Delucchi & Pschorn-Walch., 1955)	146
<i>H. vitripennis</i> (Meigen, 1822)	160
<i>Lejogaster metallina</i> (Fabricius, 1777)	129, 130, 133, 139, 146, 160, 168, 169
<i>Lejota ruficornis</i> (Zetterstedt, 1843)	160
<i>Leucozona glaucia</i> (Linnaeus, 1758)	146, 169
<i>L. inopinata</i> Doczkal, 2000	123
<i>L. laternaria</i> (Müller, 1776)	114, 115, 119, 130, 146, 168, 177
<i>L. lucorum</i> (Linnaeus, 1758)	111, 114, 115, 117, 122, 123, 127, 130, 131, 134, 137, 139, 146, 147, 154, 155, 157, 160, 162, 164, 165, 167, 168, 169, 173, 174, 175, 179, 180, 181, 182, 184, 186, 188
<i>Megasyrphus erraticus</i> (Linnaeus, 1758)	103, 115, 123, 165
<i>Melangyna arctica</i> (Zetterstedt, 1838)	117, 118, 123, 124, 127, 130, 139, 146, 147, 148, 149, 152, 154, 157, 160, 162, 165, 166, 167, 168, 169, 172, 173, 174, 175, 176, 177, 181, 182, 184
<i>M. coei</i> Nielsen, 1971	115, 122, 127, 130, 138, 146, 154, 157, 160, 162, 165, 166, 168, 169, 172, 174, 177, 182
<i>M. compositarum</i> (Verrall, 1873)	101
<i>M. lasiophthalma</i> (Zetterstedt, 1843)	107, 115, 117, 147, 154, 162
<i>M. umbellatarum</i> (Fabricius, 1794)	115
<i>Melanogaster aerosa</i> (Loew, 1843)	136, 139, 146
<i>M. parumplicata</i> (Loew, 1840)	115, 130, 139
<i>Melanostoma dubium</i> (Zetterstedt, 1838)	103, 122, 123, 131, 144, 146, 158, 160, 165, 168, 179, 182, 184, 188
<i>M. mellinum</i> (Linnaeus, 1758)	103, 117, 122, 146, 147, 165, 173, 181, 186, 188

TABLE 1. continued

Species	EIS
<i>M. scalare</i> (Fabricius, 1794)	106, 110, 111, 113, 114, 115, 116, 117, 118, 119, 122, 123, 124, 126, 127, 130, 131, 133, 134, 137, 138, 139, 145, 146, 147, 153, 154, 160, 161, 162, 164, 165, 166, 169, 173, 177, 181, 182, 184, 185, 186, 188
<i>Meligramma guttata</i> (Fallén, 1817)	123, 146, 154, 160, 165, 166, 168, 177
<i>M. triangulifera</i> (Zetterstedt, 1843)	123, 146, 160, 169
<i>Meliscaeva cinctella</i> (Zetterstedt, 1843)	103, 106, 107, 110, 111, 114, 115, 117, 118, 122, 123, 127, 130, 138, 139, 146, 164, 165, 168, 169, 176, 182, 187
<i>Microdon analis</i> (Macquart, 1842)	103, 115, 123, 126, 127, 147, 154, 160, 165
<i>Myathropa florea</i> (Linnaeus, 1758)	169
<i>Neoascia geniculata</i> (Meigen, 1822)	117, 123, 127, 138, 146, 154, 155, 157, 160, 162, 165, 168, 169, 173, 174, 181, 182
<i>N. meticulousa</i> (Scopoli, 1763)	147, 160, 169
<i>N. podagrica</i> (Fabricius, 1775)	110, 114, 115, 117, 123, 137, 146
<i>N. subchalybea</i> Curran, 1925	156, 160, 174
<i>N. tenur</i> (Harris, 1780)	113, 114, 117, 118, 123, 127, 131, 134, 139, 145, 147, 153, 154, 155, 157, 158, 160, 162, 168, 169, 170, 171, 173, 174, 178, 182
<i>Orthonevra geniculata</i> (Meigen, 1830)	123, 143, 147, 160, 166, 167, 169, 173, 174, 177, 184
<i>Paragus haemorrhous</i> Meigen, 1822	157, 167
<i>P. punctulatus</i> Zetterstedt, 1838	139, 163
<i>Parasyrphus annulatus</i> (Zetterstedt, 1838)	110, 114, 115, 123, 126, 127, 146, 160, 165, 167, 169
<i>P. groenlandicus</i> (Nielsen, 1910)	160
<i>P. lineolus</i> (Zetterstedt, 1843)	106, 110, 111, 115, 118, 123, 131, 134, 146, 153, 160, 162, 165, 167, 168
<i>P. macularis</i> (Zetterstedt, 1843)	107, 115, 123
<i>P. malinellus</i> (Collin, 1952)	115
<i>P. nigratarsis</i> (Zetterstedt, 1843)	108, 117, 146, 159, 162, 165, 167, 168, 169, 174, 177, 179, 180, 182, 184
<i>P. punctulatus</i> (Verrall, 1873)	123
<i>P. tarsatus</i> (Zetterstedt, 1838)	103, 107, 117, 119, 122, 123, 124, 127, 130, 136, 146, 147, 149, 154, 155, 156, 157, 159, 160, 162, 163, 164, 165, 168, 169, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 187, 188, 189
<i>P. vittiger</i> (Zetterstedt, 1843)	123, 134, 138, 146, 157, 159, 160, 164, 165, 167, 168, 169, 173, 174
<i>Pelecocera caledonica</i> Collin, 1940	160, 169, 173
<i>P. scaevoides</i> (Fallén, 1817)	131, 147, 154, 160, 162, 169, 173
<i>Pipiza bimaculata</i> Meigen, 1822	111, 127, 134, 146, 154, 160, 165, 173
<i>P. luteitarsis</i> Zetterstedt, 1843	122
<i>P. noctiluca</i> (Linnaeus, 1758)	123, 127, 134, 139, 146, 160, 164, 165, 173
<i>P. quadrimaculata</i> (Panzer, 1804)	103, 104, 107, 110, 111, 115, 123, 134, 146

TABLE 1. continued

Species	EIS
<i>Pipizella viduata</i> (Linnaeus, 1758)	133, 139, 162, 169, 170
<i>Platycheirus albimanus</i> (Fabricius, 1781)	101, 103, 110, 111, 113, 114, 115, 117, 122, 123, 124, 125, 127, 130, 131, 134, 138, 139, 145, 146, 147, 149, 153, 154, 155, 157, 160, 161, 162, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 176, 177, 178, 179, 180, 181, 182, 184, 185, 187, 188, 189
<i>P. ambiguus</i> (Fallén, 1817)	130, 162
<i>P. amplus</i> Curran, 1927	101, 114, 115, 123, 127, 130, 131, 138, 139, 146, 153, 154, 157, 160, 162, 165, 167, 168, 169, 173, 174, 177, 182
<i>P. angustatus</i> (Zetterstedt, 1843)	97, 101, 114, 123, 127, 138, 139, 146, 154, 160, 161, 173, 182
<i>P. carinatus</i> (Curran, 1927)	162, 172
<i>P. clypeatus</i> (Meigen, 1822)	97, 101, 106, 110, 111, 113, 116, 117, 122, 123, 126, 127, 130, 131, 138, 139, 145, 146, 147, 149, 154, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 173, 174, 175, 176, 177, 178, 181, 182, 183, 184, 187, 188, 189
<i>P. europaeus</i> Goeldlin, Maibach & Speight, 1990	117, 127, 130, 146, 177, 188
<i>P. fulviventris</i> (Macquart, 1829)	157
<i>P. groenlandicus</i> Curran, 1927	147, 148, 156, 157, 160, 163, 165, 174, 177, 181, 188
<i>P. holarcticus</i> Vockeroth, 1990	114, 134, 139, 146, 154, 155, 157, 160, 162, 165, 167, 168, 174, 175, 177, 185, 188
<i>P. hyperboreus</i> (Stæger, 1845)	122, 127, 138, 157, 160, 165, 169, 173, 174, 177, 183, 184, 188, 189
<i>P. immarginatus</i> (Zetterstedt, 1849)	131, 146, 160, 173
<i>P. jaerensis</i> Nielsen, 1971	184
<i>P. kittilaensis</i> Dušek & Láska, 1982	146, 160, 162, 163, 165, 169, 174, 175, 177, 181, 184, 188
<i>P. laskai</i> Nielsen, 1999	145, 146
<i>P. latimanus</i> (Wahlberg, 1845)	145, 147, 154, 162, 172
<i>P. lundbecki</i> (Collin, 1931)	147, 154, 160, 168, 174
<i>P. manicatus</i> (Meigen, 1822)	101, 103, 108, 110, 111, 114, 115, 117, 122, 123, 124, 125, 127, 129, 130, 131, 133, 134, 136, 137, 138, 139, 144, 145, 146, 152, 153, 154, 155, 157, 160, 162, 164, 165, 166, 167, 168, 169, 170, 171, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 184, 187, 188, 189
<i>P. nielseni</i> Vockeroth, 1990	108, 110, 111, 114, 117, 123, 134, 137, 138, 146, 154, 159, 160, 162, 165, 167, 168, 177
<i>P. nigrofemoratus</i> Kanervo, 1934	157, 164, 175, 181
<i>P. occultus</i> Goeldlin, Maibach & Speight, 1990	173, 177
<i>P. parmatus</i> Rondani, 1857	106, 111, 115, 123, 127, 130, 139, 146, 173, 182
<i>P. peltatus</i> (Meigen, 1822)	101, 111, 114, 115, 119, 123, 127, 130, 138, 146, 160, 165, 169, 175, 177, 182, 188
<i>P. perpallidus</i> (Verrall, 1901)	119, 123, 157, 160, 168, 169, 174, 189



TABLE 1. continued

Species	EIS
<i>P. podagratus</i> (Zetterstedt, 1838)	101, 103, 110, 122, 123, 127, 130, 131, 134, 138, 139, 146, 148, 149, 154, 155, 157, 158, 160, 162, 164, 165, 167, 168, 169, 173, 174, 176, 177, 181, 182, 183, 184, 185, 187, 189
<i>P. ramsarensis</i> Goeldlin, Maibach & Speight, 1990	117, 130, 136, 137, 138, 139, 147, 155, 162, 163, 168, 170, 174, 177
<i>P. scambus</i> (Stæger, 1843)	101, 106, 110, 114, 115, 117, 122, 123, 127, 130, 133, 136, 138, 139, 145, 146, 147, 154, 155, 160, 161, 162, 168, 169
<i>P. scutatus</i> (Meigen, 1822)	101, 114, 115, 123, 127, 130, 146, 153, 162, 173, 180, 181
<i>P. splendidus</i> Rotheray, 1998	162
<i>P. subordinatus</i> (Becker, 1915)	155, 157, 165, 172, 174, 176, 177, 178, 179, 181, 182, 183, 184, 187, 188, 189
<i>P. tarsalis</i> (Schummel, 1836)	146
<i>P. transfugus</i> (Zetterstedt, 1838)	118, 173
<i>P. urakawensis</i> (Matsumura, 1919)	157, 160, 165, 167, 175
<i>P. varipes</i> Curran, 1923	160, 168, 176, 184
<i>Pyrophaena graditarsa</i> (Forster, 1771)	138, 154, 173
<i>Rhingia borealis</i> Ringdahl, 1928	103, 108, 114, 123, 124, 147, 154, 159, 162, 165
<i>R. campestris</i> Meigen, 1822	107, 108, 110, 113, 114, 115, 117, 118, 121, 122, 123, 130, 131, 139, 145, 153, 154, 160, 162, 165, 169, 173, 181, 182, 183
<i>Scaeva selenitica</i> (Meigen, 1822)	110, 159, 162, 168, 173
<i>Sericomyia arctica</i> Schirmer, 1913	160
<i>S. jakutica</i> (Stackelberg, 1927)	181
<i>S. lappona</i> (Linnaeus, 1758)	97, 103, 110, 111, 119, 122, 123, 124, 127, 130, 131, 136, 137, 139, 146, 147, 152, 154, 159, 160, 162, 164, 165, 166, 168, 169, 171, 172, 173, 176, 177, 178, 181, 182, 184, 186, 188
<i>S. nigra</i> Portschinsky, 1873	115, 117, 123, 139, 147, 160, 168
<i>S. silentis</i> (Harris, 1776)	98, 101, 103, 108, 110, 118, 122, 123, 130, 131, 134, 136, 137, 147, 152, 154, 162
<i>Sphaerophoria abbreviata</i> Zetterstedt, 1859	160, 165, 172, 174, 175, 181, 183
<i>S. bankowskiae</i> Goeldlin, 1989	160, 165, 173
<i>S. batava</i> Goeldlin, 1974	110, 131, 137, 147, 160, 165, 169, 172
<i>S. boreoalpina</i> Goeldlin, 1989	131, 154, 160, 165, 173, 179, 180
<i>S. fatarum</i> Goeldlin, 1989	110, 123, 127, 138, 147, 160, 165, 167, 168, 171, 172, 173, 177
<i>S. interrupta</i> (Fabricius, 1805)	98, 101, 106, 114, 115, 122, 123, 124, 127, 130, 131, 134, 138, 144, 146, 147, 149, 154, 155, 157, 158, 160, 162, 164, 165, 167, 168, 169, 172, 173, 174, 175, 176, 177, 181, 183, 184, 187, 188
<i>S. laurae</i> Goeldlin, 1989	157, 159, 165
<i>S. philantha</i> (Meigen, 1822)	98, 115, 117, 122, 127, 130, 134, 138, 139, 146, 152, 154, 157, 158, 159, 160, 162, 165, 166, 167, 168, 169, 170, 172, 173, 174, 175, 176, 177, 179, 181, 182, 187, 188
<i>S. rueppelli</i> (Wiedemann, 1830)	97
<i>S. scripta</i> (Linnaeus, 1758)	98, 115, 122, 123, 130, 134, 152, 155, 173, 174, 175, 184

TABLE 1. continued

Species	EIS
<i>S. taeniata</i> (Meigen, 1822)	160, 165, 169, 172
<i>S. virgata</i> Goeldlin, 1974	115, 123, 127, 138, 154, 160, 172
<i>Sphegina clunipes</i> (Fallén, 1816)	101, 103, 111, 115, 122, 123, 131, 146, 148, 154, 155, 165, 173
<i>S. montana</i> Becker, 1921	169
<i>S. sibirica</i> Stackelberg, 1953	101, 160, 168, 173
<i>S. sphenoginea</i> (Zetterstedt, 1838)	123, 160
<i>Syrirta pipiens</i> (Linnaeus, 1758)	92, 97, 98, 101, 106, 114, 115, 118, 121, 122, 123, 129, 130, 131, 133, 134, 136, 137, 138, 146, 147, 153, 154, 160, 162, 164, 165, 168, 169, 171, 173, 176, 182
<i>Syrphus attenuatus</i> Hine, 1922	147, 157, 160, 164, 167, 174, 177, 178
<i>S. ribesii</i> (Linnaeus, 1758)	101, 107, 111, 114, 115, 117, 118, 122, 123, 124, 127, 130, 131, 134, 136, 139, 146, 147, 153, 154, 157, 158, 159, 160, 162, 164, 165, 166, 167, 168, 169, 173, 174, 175, 176, 179, 180, 181, 182, 184, 185
<i>S. sexmaculatus</i> (Zetterstedt, 1838)	104, 108, 115, 138, 139, 146, 147, 154, 160, 165, 167, 173, 174
<i>S. torvus</i> Osten Sacken, 1875	106, 107, 110, 114, 115, 116, 122, 123, 131, 136, 138, 139, 146, 147, 152, 154, 157, 158, 159, 160, 162, 165, 166, 168, 169, 171, 173, 174, 176, 177, 179, 182, 184, 188
<i>S. vitripennis</i> Meigen, 1822	101, 115, 117, 123, 127, 130, 136, 147, 153, 162, 168, 169, 173, 175, 176
<i>Temnostoma apiforme</i> (Fabricius, 1794)	107, 147, 148, 154, 160, 164, 176
<i>T. vespiforme</i> (Linnaeus, 1758)	108, 115, 127, 134, 138, 154, 164, 165
<i>Trichopsomyia flavitarsis</i> (Meigen, 1822)	127, 139, 173
<i>Volucella bombylans</i> (Linnaeus, 1758)	96, 101, 107, 108, 110, 114, 115, 122, 123, 125, 126, 127, 130, 131, 134, 139, 146, 147, 153, 154, 160, 168, 169, 170
<i>V. pellucens</i> (Linnaeus, 1758)	123, 162
<i>Xylota jakutorum</i> Bagatshanova, 1980	103, 104, 110, 123, 160
<i>X. meigeniana</i> Stackelberg, 1964	139
<i>X. segnis</i> (Linnaeus, 1758)	101, 107, 110, 111, 114, 115, 118, 122, 123, 131, 146, 147, 154, 162, 164
<i>X. suecica</i> (Ringdahl, 1943)	160, 169
<i>X. tarda</i> Meigen, 1822	114, 131, 138, 139, 146, 160
<i>X. triangularis</i> Zetterstedt, 1838	160

(Zetterstedt, 1838). The identity of *E. fratercula* has been discussed in a previous paper (Nielsen 1995). **New synonym.**

*Melangyna stackelbergi* Violovitsh, 1980 male holotype dated “Хакасия, окр. пос. Кубанка, 24/VI 1972 Челябин” is synonymous with *M. coei* Nielsen, 1971. **New synonym.**

*Platycheirus rarus* Violovitsh, 1978 female holotype dated “SW Altay, Dzhaga-ter River, near Karakul’ Lake, 18.VII.64, Violovitsh N.A. leg.”. It is identical to *manicatus* (Meigen, 1822). **New synonym.**

## The hoverfly fauna (main components) of different habitats

### Tundra (Figures 1–2).

Species: *Cheilosia alpina*, *C. melanopa*, *C. sahlbergi*, *C. pubera*, *C. chrysocoma*, *C. gigantea*, *Eristalis hirta*, *Eupeodes punctifer*, *Helophilus groenlandicus*, *H. lapponicus*, *Melangyna arctica*, *Melanostoma dubium*, *Parasyrphus tarsatus*, *Platycheirus carinatus*, *P. groenlandicus*, *P. holarcticus*, *P. lundbecki*, *P. manicatus*, *P. podagratus* (in humid areas), *P. ramsarensis*, *P. subordinatus*, *P. varipes*.

As expected the hoverfly fauna on the tundra is less rich in species, but often dominated by a few species which may occur in numbers. On the windy northern and northeastern coast of Finnmark (EIS 187, 188, 189, 185) we often found a concentration of hoverflies in the minor valleys and crevices, close to the ground. On these coastal tundra localities *Platycheirus subordinatus* was found in numbers, often sitting in the *Caltha* and *Ranunculus* flowers. Also *Cheilosia alpina*, *chrysocoma* and *melanopa* were seen amongst abundant *Parasyrphus tarsatus* and *Helophilus pendulus*.

### Taiga (Figure 3).

Humid forest with *Vaccinium vitis-idaea*, *Rhododendron palustre* and *Rubus chamaemorus*.

Species: *Chrysosyrphus nasutus*, *C. niger*, *Dasysyrphus* sp., *Helophilus* sp., *Temnostoma apiforme*, *T. vespiforme*.

Dry Pinus forest with *Calluna*, *Vaccinium* and *Empetrum* on elevated areas: very poor in species and individuals, but scattered *Cheilosia aff. longula*, *Melanostoma* sp. and *Parasyrphus tarsatus*. In mid July 1989 *Pelecocera caledonica* was found in numbers on *Solidago virgaurea* at Gjøkåsen, Pasvik.

### Bogs, river banks, borders of lakes, ditches (Figure 3).

Species found: *Anasimyia lineata*, *A. lunulata*, *Chrysosyrphus nasutus*, *C. niger*, *Eristalis anthophorina*, *E. cryptarum*, *E. fratercula*, *E. gomojunovae*, *Helophilus groenlandicus*, *H. lapponicus*, *H. pendulus*, *Orthonevra geniculata*,

*Platycheirus perpallidus*, *P. podagratus*, *P. scambus*, *Sericomyia arctica*, *S. jakutica* and *S. lappona*.

### Farms and cultivated areas (Figure 4).

Species: *Cheilosia albitarsis*, *C. gigantea*, *C. naruska*, *C. vernalis*, *Eristalis* sp., *Eupeodes corollae*, *E. latifasciatus*, *E. lundbecki*, *Helophilus groenlandicus*, *H. lapponicus*, *Lejogaster metallina*, *Neoascia geniculata*, *Platycheirus albimanus*, *P. clypeatus*, *Sphaerophoria* sp., *Syrirta pipiens*, *Syrphus* sp.

### Comments on species

#### *Chalcosyrphus jacobsoni* (Stackelberg, 1921).

A single female in humid *Alnus* and *Pinus* forest, FI, Alta: Vina near Gargia (EIS 165) 16 July 1977 leg. TRN (Nielsen 1999: 26).

#### *Cheilosia frontalis* Loew, 1857

An early species with few records from Norway. On some occasions (e.g. NSI, Rana: Dunderland 20 June 1981) found in large numbers on blooming *Salix*.

#### *Cheilosia naruska* Haarto & Kerppola, 2007

Reported from the Pasvik valley (Nielsen 2008). Another record by B. A. Sagvolden and S. Svendsen: FØ, Sør-Varanger: Bjørknes, EIS 168, 35W PT 171036 3 July 2006, 1♂, in coll. S. Svendsen.



FIGURE 5. *Dasysyrphus nigricornis* (Verrall, 1873) (male). Photo TRN.

***Dasyrphus nigricornis* (Verrall, 1873)**

A small and dark *Dasyrphus* species, face and frons broad and dark, predominantly dark haired. Male with reduced yellow spots on tergite 2 (Figure 5). Mainly found in taiga (*Pinus*) forest areas, on *Caltha palustris* and *Rhododendron palustre*.

***Epistrophe cryptica* Doczkal & Schmid, 1994**

The second Norwegian find of this species: FØ, Sør-Varanger: Neiden (EIS 168) 28–29 June 1990, 1♀ on *Anthriscus sylvestris*. Leg. TRN.

***Eristalinus aeneus* (Scopoli, 1763)**

Photo documented at Mørkvedbukta, Bodø (67°20'N) 7 September 2010 (Geir Ørsnes in <http://artsobservasjoner.no/>). A northernmost record for *aeneus*.

***Eristalis fratercula* (Zetterstedt, 1838)**

A rare beauty of the wetlands up north. Similar to *anthophorina*, but recognizable from that in black hairs on the genae (pale hairs in *anthophorina*). Figure 6. Larva: see page 131–132.

***Eristalis hirta* Loew, 1866**

syn. *tundrarum* Frey, 1932; see Hippa *et al.* 2001).

Often a dominating *Eristalis* species, especially in cultivated areas, on *Matricaria indora* and *Taraxacum*.

***Eupeodes biciki* Nielsen, 2003**

Described from Tromsø on a single male. A broad frons and white hairs on scutellum are male characters for this rare species. Figure 7.

***Helophilus lapponicus* Wahlberg, 1844**

Variable as to the grey stripes on mesonotum and tergites 3–4. Figure 8.

***Neoascia geniculata* (Meigen, 1822)**

While rather rare in South Norway, *geniculata* was frequent and often numerous at given sites in North Norway. The first author found it in large numbers on several farms with piles of horse manure, like in FV, Alta: Gargia (EIS 165) 16 July 1977 84♂♂35♀♀ and FN, Porsanger: Lakselv (EIS 174) 26–27 June 1979 10♂♂10♀♀.



FIGURE 6. *Eristalis fratercula* (Zetterstedt, 1838) (male). Photo TRN.



FIGURE 7. *Eupeodes biciki* Nielsen, 2003, male holotype with a characteristic wide frons and white haired scutellum. Photo A.C. Nilssen.



FIGURE 8. *Helophilus lapponicus* Wahlberg, 1844. Photo A.B. Sortland.

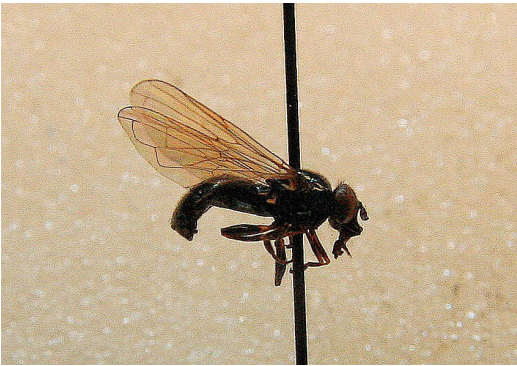


FIGURE 9. *Neoscia subchalybea* Curran, 1925 with its prolonged lower part of face. Photo TRN.



FIGURE 10. *Platycheirus nigrofemoratus* Kanervo, 1934, male fore tibia and tarsus. Photo K. Solheim.

#### *Neoscia subchalybea* Curran, 1925

FØ, Sør-Varanger: Vaggetem, Gjøkåsen, EIS 160, 21 June 1974 1♀, leg. A. Fjellberg; Vaggetem 30 June 1977 1♀ and Emmanuelbekken 28 June 1977 1♀; FN, Porsanger: Lakselv, EIS 174, 26–27 July 1979 2♀♀, leg. I. & T.R. Nielsen. Figure 9.

#### *Platycheirus nigrofemoratus* Kanervo, 1934

TRI, Nordreisa: Storslett, Andsjøen, EIS 164, 8 July 1979 1♂, leg. I. & T.R. Nielsen; FI, Kautokeino: Kautokeino, EIS 157, 3–4 July 1979 2♂♂, leg. I. & T.R. Nielsen; FN, Lakselv: Kistrand, EIS 181, 9 June 1974 1♂, leg. A. Fjellberg; Tana: Levajok EIS 175 5 July 1977, 1♂, 6♀♀, leg. I. & T.R. Nielsen.

Very similar to *P. albimanus*, but apical margin of male fore basitarsus arcuate or widely  $\Lambda$  shaped. Figure 10.

#### *Platycheirus urakawensis* (Matsumara, 1919)

FN, Tana: Levajok EIS 175 5 July 1977 6♀♀, leg. I. & T.R. Nielsen; FI, Karasjok: Sopparjok EIS 167 18 July 1978 1♀, leg. K. Rognes; Kautokeino: Kautokeino, EIS 157 3–4 July 1979 4♀♀; Alta: Gargia, EIS 165 28 June 1979 1♀; FØ, Sør-Varanger: Fiskevann 14 July 1969 EIS 160 1♀, leg. I. & T.R. Nielsen.

New to the Norwegian fauna. The *urakawensis* female is very similar to the *nigrofemoratus* female, but Bartsch *et al.* (2009 a: 84) found the lower part of posterior anepisternum shining and the two longest bristles on scutellum black as characters in *urakawensis*. Figure 11.

#### *Eristalis fratercula* (Zetterstedt, 1838) larva

The larva of this *Eristalis* species has been unknown.

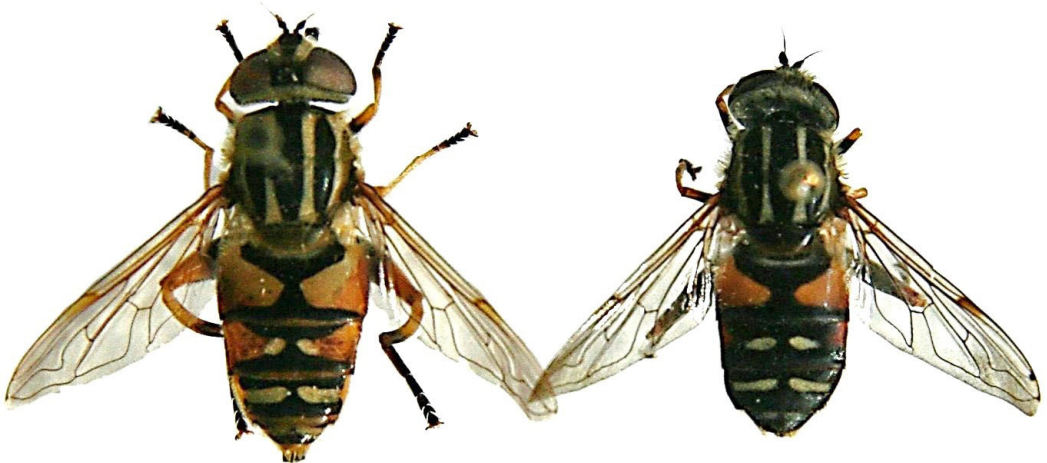
A *fratercula* female, collected at Skogmo, Pasvik 2 July 2006, was kept in a glass jar, fed with drops of diluted honey applied on a *Ranunculus*



FIGURE 11. *Platycheirus urakawensis* (Matsumara, 1919) female. Photo K. Solheim.



**FIGURE 12.** *Eristalis fratercula* (Zetterstedt, 1838) larva. Photo TRN.



**FIGURE 13.** *Helophilus pendulus* (Linnaeus, 1758) females. Left: normally coloured specimen from South Norway. Right: dark specimen from NE Finnmark (Slettnes). Photo TRN.

flower and given a plastic dish with a solution of soil, water and cow manure. After a few days small larvae appeared and developed in the dish. One of them was photographed when nearly fully grown (Figure 12). A number of larvae of different stages were killed in hot water and preserved in 70% alcohol.

## Discussion

**Variation in annual populations.** Annual variations of northern populations are known to occur amongst Lepidoptera (Mikkola 1976, Aarvik 2011). This seems also to be the fact in hoverflies in North Norway. Despite several collecting trips to Eastern Finnmark *Cheilosia naruska* and *C. flavissima* were not found until they showed up in numbers in 2008. Also *Eristalis hirta*, *Eupeodes punctifer* and *Helophilus lapponicus* have shown similar “mass occurrence” in the odd years 1983, 1979 and 1983 respectively. The biennial rhythm is probably a consequence of larval stages over two years.

**Adaptations to a cold climate.** Body coloration: it is well known that many insect species develop darker coloration under cold than under warmer conditions. This was shown by Dušek & Láska (1974) to occur in several hoverfly species (Syrphidae) when the pupal stage was kept under low temperatures. In our material specimens of *Helophilus pendulus* from the arctic coast of northern Finnmark (EIS 188 and 189) showed such colour adaptations. Especially the abdomen but also thorax and the legs were darker than in specimens from South Norway (Figure 13).

**Behaviour.** On sunny but cold and windy days at Slettnes (in 2011) and Kiberg (in 2008) some of the species (e.g. *Platycheirus subordinatus*) were nearly immovable in the flowers, but slowly eating pollen and nectar. They were very little shy, but when sufficiently disturbed they escaped by “rolling” out of the flowers and dropped into the vegetation.

**Prolonged larval stages.** According to our observations the populations of at least some species has fluctuated over the years, from low to

high numbers of individuals – as mentioned above.

**Acknowledgements.** We wish to thank the following persons and institutions for sending us material from their collections, or helping in other practical ways: Andreas Tore Andreassen, Borlaug, Paul Eric Aspholm, Bioforsk Svanhovd, Morten A. Falck, Oslo, Arne Fjellberg, Tjøme, Lita Greve Jensen, Bergen Museum, Arne C. Nilssen and Robert Bergersen, Tromsø Museum, Bjørn A. Sagvolden, Kongsberg, Knut Rognes, Oslo, Per Ole Syvertsen, Helgeland Museum, Mo i Rana, Karsten Sund and Leif Aarvik, Naturhistorisk Museum, Oslo and Sergey Yu. Kusnetsov, ZISP, St. Petersburg. The first author is also grateful to his family, Inger, Thorvald, Kristin and Ingunn for their many contributions on several expeditions to North Norway, and to Fylkesmannen i Finnmark, Miljøvernnavdelingen for financial support (2008). Sandnes videregående skole gave him financial support for field work and for a long-term loan of technical equipment. The second author wants to thank Torstein Johnsrud and Roy Erling Wrånes, Gamvik museum/Slettnes lighthouse for various practical help. Michelle Locke, Ottawa is acknowledged for examining specimens of our variable *Dasyisyrphus* material. Geir Ørsnes, Bodø documented *Eristalinus aeneus* from the Bodø region, Arne C. Nilssen, Tromsø, Kåre Solheim, Sandnes and Andy B. Sortland, Tromsø are acknowledged for permission to use their photographs. The late Raymond Ryeng, Strand, Vilhelm Høgre, Lyngmo and Hans Schaanning, Noatun are acknowledged for their generous help on our first trips to Finnmark. We finally want to thank our editor, Øivind Gammelmo and our unknown referee for the painstaking work in improving the presentation of our paper.

## References

- Aarvik, L. 2011. *Xestia gelida* (Sparre Schneider, 1883) (Lepidoptera, Noctuidae) rediscovered in Norway. *Norwegian Journal of Entomology* 58, 1–6.
- Bartsch, H., Binkiewicz, E., Klintbjer, A., Rådén, A., Nasibov, E., Nordin, A., Östman, T., Hall, K. & Reisborg, C. 2009a. *Tvävingar: Blomflugor. Del 1, Diptera: Syrphidae, Syrphinae*. Nationalnyckeln till Sveriges flora och Fauna. ArtDatabanken, SLU.
- Bartsch, H., Binkiewicz, E., Klintbjer, A., Rådén, A., Nasibov, E., Nordin, A., Östman, T., Hall, K. & Reisborg, C. 2009b. *Tvävingar: Blomflugor. Del 2, Diptera: Syrphidae, Eristalinae & Microdontinae*. Nationalnyckeln till Sveriges flora och Fauna. ArtDatabanken, SLU.
- Bidenkap, O. 1900. Foreløbig oversigt over de i det arktiske Norge hidtil bemærkede Diptera

- Brachycera. Tromsø Museums Aarshefter 23, 13–112.
- Dušek, J. & Láška, P. 1974. Influence of temperature during pupal development on the colour of Syrphid adults (Syrphidae, Diptera). *Folia Facultatis Scientiarum Naturalium Universitatis Purkynianae Bruennsis*, Tomus XV, *Biologia* 43, 77–81.
- Gammelmo, Ø. & Nielsen, T.R. 2008. Further records of hoverfly species (Diptera, Syrphidae) in Norway. *Norwegian Journal of Entomology* 55, 19–25.
- Hippa, H., Nielsen, T.R. & van Steenis, J. 2001. The West Palaearctic species of the genus *Eristalis* Latreille (Diptera, Syrphidae). *Norwegian Journal of Entomology* 48, 289–327.
- Mazánek, L., Láška, P., Bičík, V. & Nielsen, T.R. 1999. Key to males of Norwegian species of *Eupeodes* (Diptera: Syrphidae). *Dipterologica bohemoslovaca* 9, 143–152.
- Mazánek, L., Láška, P., Bičík, V. & Nielsen, T.R. 2004. Key to females of Norwegian species of *Eupeodes* (Diptera, Syrphidae). *Folia Fac. Sci. Nat. Univ. Masaryk. Brun., Biol.* 109, 203–213.
- Mikkola, K. 1976. Alternate-year flight of Northern *Xestia* species (Lep., Noctuidae) and its adaptive significance. *Annales Entomologici Fennici* 42, 191–199.
- Moen, A. 1998. Nasjonalatlas for Norge. Vegetasjon. Statens Kartverk, Hønefoss. 200 p.
- Nielsen, T.R. 1971. Syrphidae (Dipt.) from Jæren, Norway, I, with description of two new species. *Norsk entomologisk Tidsskrift* 18, 53–73.
- Nielsen, T.R. 1974. Notes on two northern species of the genus *Platycheirus* St.-Farg. et Serv. (Dipt., Syrphidae). *Norsk entomologisk Tidsskrift* 21, 167–172.
- Nielsen, T.R. 1981. Studies on *Platycheirus* Lepeletier & Serville: *P. complicatus* Becker, *P. latitarsis* (Wahlberg) and *P. boreomontanus* nom. nov. (Diptera: Syrphidae). *Ent. scand.* 12, 99–102.
- Nielsen, T.R. 1990. A survey of some Norwegian Hoverfly genera (Diptera: Syrphidae). Stavanger Museums Årbok 1989, 81–100.
- Nielsen, T.R. 1992. On the Syrphid genera *Brachyopa* Meigen and *Hammerschmidtia* Schummel in Norway. *Fauna norvegica Serie B* 39, 39–43.
- Nielsen, T.R. 1995. Studies on some northern *Eristalis* species (Diptera, Syrphidae). *Int. J. Dipt. Research* 6, 129–133.
- Nielsen, T.R. 1996. Syrphidae. Blomsterfluer, pp. 267–270. In Aagaard, K. & Dolmen, D.: *Limnofauna Norvegica*. Katalog over norsk ferskvannsfåuna. Tapir Forlag, Trondheim.
- Nielsen, T.R. 1997. The Hoverfly genera *Anasimyia* Schiner, *Helophilus* Meigen, *Parhelophilus* Girschner and *Sericomyia* Meigen in Norway (Diptera, Syrphidae). *Fauna norvegica Serie B* 44, 107–122.
- Nielsen, T.R. 1998. Hoverflies (Dipt., Syrphidae) in the arctic Pasvik valley, Norway. *Fauna norvegica Serie B* 45, 83–92.
- Nielsen, T.R. 1999. Check-list and distribution maps of Norwegian Hoverflies, with description of *Platycheirus laskai* nov. sp. (Diptera, Syrphidae). *NINA Fagrapport* 035, 1–99. Trondheim. ISBN 82-426-1004-5.
- Nielsen, T.R. 2003. Description of *Eupeodes biciki* spec. nov. (Diptera, Syrphidae) from northern Norway. *Norwegian Journal of Entomology* 50, 99–103.
- Nielsen, T.R. 2005. Additions and a correction to the Norwegian Hoverfly fauna (Diptera, Syrphidae). *Norwegian Journal of Entomology* 52, 139–144.
- Nielsen, T.R. 2008. *Cheilosia naruska* Haarto & Kerppola, 2007 and *Sphegina montana* Becker, 1921 in Pasvik, North Norway (Diptera, Syrphidae). *Norwegian Journal of Entomology* 55, 235–236.
- Nielsen, T.R. & Claussen, C. 2001. On *Cheilosia ingerae* spec. nov. (Diptera, Syrphidae) from northern Fennoscandia. *Dipteron* 4, 43–56.

Received: 12 October 2013  
Accepted: 6 September 2014