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Atlas of the Clusiidae (Diptera) in Norway

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Front cover: *Clusia flava* Meigen, 1830; redrawn after Lintdner 1949.

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Atlas of the Clusiidae (Diptera) in Norway

Lita Greve

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The distribution of the ten species of the family Clusiidae (Diptera) in Norway is presented on EIS grid maps. Supplementary information on the total distribution range of each species and on flight periods is given.This survey is based on a material of 1189 specimens, 649 ♂♂ and 540 ♀♀. One species *Clusiodes (Clusaria) pictipes* Zetterstedt, 1838 has previously not been recorded in Norway.

Keywords: Clusiidae, Diptera, Norway, distribution.

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INTRODUCTION

Twentyfour genera and 246 species of the fly family Clusiidae have been recorded worldwide. Of these only nine genera and 31 species occur in the Palaearctic (Sasakawa 1998). In those species where larvae are known, they live as saproxylics in rotten logs or stumps of various trees, as well as in galleries excavated by other insects. Therefore the adult flies often occur around the trunks of rotten and dying trees (Sasakawa 1998).

The first record of a clusiid fly from Norway was *Clusiodes geomyzinus* (Fallén, 1823) from Bjerkvik, Nordland province (Zetterstedt 1848). Some species of the family were included in Siebke (1877), here placed in other families. Siebke recorded two species only: *Clusiodes geomyzinus* (Fallén, 1823) as *Heteroneura geomyzina* in the family Agromyzides, and *Paraclusia tigrina* (Fallén, 1820) as *Heteromyza tigrina* in the family «Heteromyzides».

Nearly a hundred years later Ringdahl (1954) recorded another species viz. *Clusiodes apicalis* (Zetterstedt, 1848) from Tromsø (TRY). Greve (1983) recorded two additional species: *Clusiodes verticalis* (Collin, 1912) from Tysvær (RY) and *Hendelia beckeri* Czerny, 1903 from Kvam (HOI). Greve & Midtgaard (1986) presented a material collected from Håøya and Ostøya in inner Oslofjord, Akershus province, making a survey of the family Clusiidae in Norway which included all material present in Norwegian collections: 143 specimens. Four species were recorded as new to Norway: *Clusiodes albimanus* (Meigen, 1830), *C. ruficollis* (Meigen, 1830), *C. caledonicus* (Collin, 1912) and *Clusia flava* (Meigen, 1834).

C. fascialis (Collin, 1953), mentioned in Greve & Midtgaard (1986), has been reduced to a synonym for *C. ruficollis* (Withers 1985). In *C. ruficollis* the extent of fascial darkening is very variable.

Later *C. apicalis* was recorded from the Dovrefjell area (STY) (Greve et al. 1987). Greve & Hauge (1989) recorded *Clusiodes geomyzinus* (Fallén) and a female *Clusiodes* sp. from Sjoalemyr, Stord (HOY), a nature reserve. Greve (1996) recorded two species Clusiodes apicalis (Zett.) & *Clusiodes geomyzinus* from the Mjølfjell area (HOI).

For determination to genera and subgenera level, Sasakawa (1998) is very useful. Stubbs (1982) presented a key to species level for eight of the ten species recorded from Norway, Stackelberg (1970) presented a key that includes all norwegian species. For additional information about some of the *Clusiodes* species, see Collin (19129 and Tuomikoski (1933) who presented very good figures of the male genitalia of seven species. In some species of *Clusiodes*, the females are not possible to separate. Female Clusiodes which cannot be determined with absolute certainty are given in brackets.

With a few exceptions the material of this survey is deposited in Zoological museum, University of Bergen, alltogether 1189 specimens (649 ♂♂ 540 ♀♀). The nomenclature follows Chandler (1998), for some species Soós (1984) and Petersen & Greve (2001).

Abbreviations used are: PT = Pitfall trap ; LT = Light trap; MT = Malaise trap, CT= Collision trap, WT = Window trap and J/B = jarring/beating from bushes. ZMO = Zoological Museum, University of Oslo, ZMUK = The Zoological Museum, University of Copenhagen. The geographical divisions follows Økland (1981). Only material collected after the survey in Greve & Midtgaard 1986) is listed below. Material earlier published is mapped. The number of localities listed for each species includes also localities earlier published.

THE SPECIES

Genus: *Hendelia* Czerny, 1903

1. *Hendelia beckeri* Czerny, 1903

Total material: 5 ♂♂, 19 ♀♀ (5 ♀♀ earlier published). **Map 1.**

AK Enebakk: Nordre Bøler (EIS 29), MT, July 1996, 1 ♀. **HES** Eidskog: Bolfoss (EIS 29), MT, 24 June - 16 Aug. 1990, 1 ♀. **BØ** Røyken: Hyggen, Kinnartangen (EIS 28), MT, 6 July - 4 Aug. 1991, 1 ♂. **HOI** Granvin: Between Ålvik and Kvanndal EIS (41), MT, 28 May - 16 June 1982, 1 ♂ 4 ♀♀; Kvam: near Svevatn (EIS 31), MT, 28 May - 1 July 1997, 2 ♀♀, 1 - 28 July 1997, 1 ♀, BT, 5 June - 27 July 1997, 1 ♂, MT, Square 70, 26 May - 23 June 1998, 1 ♂ 1 ♀, Square 73, 23 June - 28 Juli 1998, 3 ♀♀; Ullensvang: Sekse (EIS 32), J/B, 28 Sept. 1982, 1 ♂. **NTI** Stjørdal: Vikan (EIS 92), MT, 14 - 20 July 1990, 1 ♀.

Number of localities: 10.

Hendelia beckeri is new to AK, HES, BØ and NTI (the northernmost record in the country); reported from western areas (HOI) as new to Norway (Greve 1983), and as well from Samnanger (HOY) (Greve & Midtgaard 1986). The species is easy to distinguish from the other small clusiids in Norway on account of the thickened, densely pubescent arista.

One male from the Svevatn area was caught in a pitfall trap.

A male from Sekse HOI was caught by jarring/beating the vegetation as late as 28 Sept., while other specimens in the material were collected between June and August.

According to Hedström (1995) the province Södermanland is the only area where *H. beckeri* has been recorded from Sweden. It is also known from Finland (Hackman 1980), but not from Denmark (Petersen & Greve 2001), nor in the British Isles. Elsewhere in Europe it has a wide distribution (Sasakawa 1998).

Genus: *Clusiodes* Coquilett, 1904

2. *Clusiodes (Clusiodes) albimanus* (Meigen, 1830)

Total material: 48 ♂♂ [34 ♀♀] (14 ♂♂ [7 ♀♀]) earlier published). **Map 2.**

Revised material: Ø Sarpsborg: Sarpsborg EIS 20 1 ♂ ZMO (published as *Heteroneura geomyzina* Fallén (Siebke 1877)).

HES Ringsaker: Helgøya, Hovindsholm (EIS 46), MT, 29 June - 27 July 1991, 2 ♂♂ [1 ♀]; Furnes, Sandvold (EIS 45), MT, May 1997, 1 ♂. **BØ** Drammen: Underlia (EIS 28), MT, June 1992, 1 ♂ [1♀]; Hurum: Tofte (EIS 28), MT, 17 June - 17 July 1985, 1 ♂, Tofteholmen (EIS 19), MT, 31 July - 1 Sept. 1991, 1 ♂ [1 ♀]; Ringerike: Sokna, Hovland (EIS 36), MT, 1 June- 3 July 2004, 2 ♂♂ 4 ♀♀. **BV** Flå: Langtjern (EIS 35), MT, 29 June - 21 July 1986, 1 ♂, Ål: Tuftelia (EIS 43), MT, 18 July - 18 Aug. 2000, 4 ♂♂. **TEY** Porsgrunn: Brevik, Dammane (EIS 11), MT, 26 June - 12 July 1988, 2 ♂♂ [2 ♀♀]. **VAY** Mandal: Eskelandsmyra, Malmø (EIS 2), MT, 6 - 22 July 1982, [1 ♀]. **RY** Finnøy: Kirkøy (EIS 14), 12 July 1986, [1 ♀], Ladsteinsvatn, MT, 19 June - 9 July 1993, 1 ♂, Sevheimsheia, MT, 9 July - 5 Aug. 1994, 1 ♂ [1 ♀]. **HOY** Bergen (Åsane): Almås (EIS 39), net, 16 July 2003, 1 ♂, MT, 5 June – 16 July 2003, 2 ♂♂, Bruås, MT, 28 July – 12 Aug. 2003 1 ♂; Os: Gåssand (EIS 31), June 1975, 1 ♂. **HOI** Kvam: Berge Nature Reserve (EIS 31), 2 MT, 4 July - 6 Aug. 2000, 1 ♂, near Svevatn (EIS 31), MT, Square 37, 28 May - 1 July 1997, 1 ♂, Square 70, MT, 23 June - 28 July 1998, 1 ♂. **SFI** Luster: Fortundalen, Yttri, Dalateigen (EIS 60), MT, 5 – 20 July 2003, 1 ♂, Fortundalen, Drægni, Ruskesethaugen (EIS 60), 28 July – 31 Aug. 2004, 2 [♀♀]. **MRI** Norddal: Fjøra (EIS 77), MT, 23 June - 18 July 1993, 1 ♂ [7 ♀♀], 18 July - 11 Sept. 1993, 3 ♂♂ [4 ♀♀], Stranda: Lauvvika (EIS 77), 6 July - 20 Aug. 2000, 2 ♂♂ [3 ♀♀].

Number of localities: 26.

Clusiodes albimanus was recorded from Norway for the first time by Greve & Midtgaard (1986) from Bærum and Frogn (AK), Mandal (VAY),

Hjelmeland (RI) and Samnanger (HOY). *C. albimanus* is here reported new to BØ, BV, RY, HOI, SFI and MRI.

C. albimanus has a southern distribution in Norway, the northernmost locality is at Fjøra in Norddal, inner parts of Møre and Romsdal province. Hedström (1995) records *C. albimanus* from several provinces in Sweden, north to Ångermansland, at approximate the same latitude as Møre and Romsdal on the Scandinavian peninsula. *C. albimanus* is known from both Finland (Hackman 1980) and Denmark (Petersen & Greve 2000). It is regarded as a common southern species on the British Isles (Stubbs 1982), and widely spread in Europe (Soós 1984).

Most specimens in this survey have been caught between July and September.

3. *Clusiodes (Clusiodes) caledonicus* (Collin, 1912)

Total material: 45 ♂♂ [43 ♀♀] (2 ♂♂ earlier published). **Map 3**.

Ø Hvaler: Ørekilen (EIS 12), 18 July 1986 2 ♂♂ [1 ♀]. **AK** Asker: Bjørkås (EIS 28), MT, 2 July - 24 Aug.1995 1 ♂ [8 ♀♀]; Nannestad: Nordmoen (EIS 37), MT, 25 June - 24 July 1986, 1 ♂ [1 ♀]. **BØ** Drammen: Underlia (EIS 28), MT, June 1992, 1 ♂, July 1995, 2 ♂♂. **AAY** Birkenes: Sennumstad (EIS 6), MT, 25 June - 6 Aug. 1986, 4 ♂♂ [4 ♀♀]. **RY** Hå: Ogna (EIS 3), 2 MT, 17 July - 21 Aug.1996, 8 ♂♂ [16 ♀♀]. **HOY** Bergen (Åsane): Vollane (EIS 39), MT, 31 July - 16 Aug. 1986, 1 ♂; Os: Sælelid (EIS 31), MT, 25 July - 1 Aug. 1991, 1 ♂, Sælelid, Haukeland, net, 4 June 1992, 1 ♂. M**RI** Norddal: (Fjøra EIS 77), MT, 23 June - 18 July 1993, 14 ♂♂ [4 ♀♀], 18 July - 11 Sept. 1993, 4 ♂♂ [6 ♀♀]. **STI** Oppdal: Lønset (EIS 79), 450 - 520 m a.s.l., 2 MT, 12 June - 13 Aug.1992, 3 ♂♂ [3 ♀♀].

Number of localities: 13.

Clusiodes caledonicus was recorded from Frogn (AK) and Sandnes (RY) (Greve & Midtgaard 1986), and these represented the first records in Norway. *C. caledonicus* is here recorded for the first time from BØ, AAY**,** HOY, MRI and STI. One male among several specimens collected at MRI Norddal: Fjøra, had dark prothorax and a lighter brown meso- and meta-thorax with dark longitudinal stripes.

The distribution of *C. caledonicus* covers S Norway, but scattered. A similar scattered distribution also in Sweden, northenmost Dalarna (Hedström 1995); **STI** Oppdal: Lønset being the northernmost known locality at the Scandinavian peninsula.

The flight period is from June to August.

C. caledonicus is known from both Finland (Hackman, 1980) and Denmark (Petersen & Greve 2001). According to Stubbs (1982), on the British Isles it seems to be confined to the Scottish Highlands.

4. *Clusiodes (Clusaria) apicalis* (Zetterstedt, 1841)

Total material: 96 ♂♂ [81 ♀♀] (23 ♂♂ [24 ♀♀]) earlier published). **Map 4.**

Revised material: AK Oslo: Tøyen, 3 June 1847, 1 ♂ published as *Heteroneura geomyzina* Fallén (Siebke 1877).

AK Rælingen: Losby (EIS 29), WT, Site 3, 24 May - 24 June 1991, 1 ♂, WT, Site 11, 24 June - 31 July 1991, 1 ♂; Lørenskog: Losby (EIS 29), WT, Site 14, 25 May - 25 June 1991, 1 ♂, 25 June - 1 Aug. 1991 1 ♀, WT, Site 33, 24 May - 25 June 1991, 5 ♂♂ 1 ♀, 25 June - 30 July 1991, 1 ♂ 1 ♀, WT, Site 34, 24 May - 24 June 1991, 1 ♂, WT, Site 94, 28 May - 28 June 1991, 1 ♂; Østby, WT, Site 47, 21 June - 31 July 1991, 1 ♂, WT, Site 62, 19 May - 19 June 1991, 1 ♀, WT, Site 95, 31 April - 31 May - 1991, 1 ♂ 1 ♀, Aamodtdammen, Site 29, 21 June 1991, 1 ♂, Site 31, 21 May - 21 June 1991,1 ♂; Enebakk: Ekeberg (EIS 29), Site 48, 24 May - 24 June 1991, 1 ♂. **HES** Ringsaker: Furnes, Sandvold (EIS 45), MT, July 1992, 1 ♂. **BØ** Hurum: Tofte (EIS 28), MT, 18 May - 2 June 1985, 1 ♀; Ringerike: Sokna, Hovland (EIS 36), MT, 3 - 23 June 2003, 1 ♂. **BV** Flå: Langtjern (EIS 35), MT, 1 May - 29 June 1986, 2 ♂♂ 2 ♀♀; Ål, Tuftelia (EIS 43), MT, appr. 450 m a.s.l., 21 May - 19 June 2000, 1 ♂. **BØ** Kongsberg: Hedenstad (EIS 27), 19 July 1995, 1 ♂. **TEY** Porsgrunn: Nitterødbekken, Kjørholt (EIS 11), MT, 13 June - 11 July 1988, 1 ♂. **TEI** Tinn: Rjukan (EIS 26), MT, June 1995, 1 ♂. **AAY** Birkenes: Sennumstad (EIS 6), MT, 26 June - 6 Aug. 1986, 1 ♂ 1♀. **RI** Forsand: Songesand (EIS 8), 28 May 1985, 2 ♂♂, Helmikstøl, 4 June 1985, 1 ♀, Helmikstøl-Håheller, 27 June 1985, 1 ♂. **HOI** Kvam: near Svevatn (EIS 31), MT, Square 37, 28 May - 1 July 1997, 6 ♂♂, 5 May - 23 June 1998 1 ♂, MT, Square 70, 26 May - 23 June 1998, 2 ♂♂. **HOI** Voss: Mjølfjell, Solbakken (EIS 41), MT, 26 June - 7 July 1991, 1 ♂ 1 ♀. **SFI** Luster: Fortundalen, Drægni, Ruskesethaugen (EIS 60), MT, 21 May – 26 June 2004, 1 ♂ 5 ♀♀. **MRI** Norddal: Fjøra, Ytste Furneset (EIS 77), MT, 11 June - 16 July 2000, 2 ♂♂ 1 ♀. **NTI** Høylandet: Skiftesåa (EIS 107), MT, 11 - 18 June 1988, 2 ♂♂ 1 ♀, 25 June - 2 July 1988, 1 ♂ 1 ♀, 2 - 9 July 1988, 1 ♀; Lierne: Kveskallen (EIS 108), MT, 7 - 26 June 1986, 3 ♂♂ 16 ♀♀, Storbekken (EIS 108), MT, 26 June - 16 July 1986, 1 ♂ 4 ♀♀. **TRY** Tromsø: Ramfjordnes (EIS 162), MT, May 1991, 13 ♂♂ 2 ♀♀, July 1991 1 ♂, Aug. 1991, 6 ♂♂. **TRI** Målselv: Kjosvoll, Kirkevollen (EIS 147), MT, Primo July - 25 July 1992, 1 ♂ 1 ♀. **FV** Alta: Mattisdalen (South) (EIS 165), MT, 23 June - 4 Aug.1996, 2 ♂♂ 1 ♀. **FØ** Sør-Varanger: Svanvik (EIS 169), MT, 20 June - 4 Aug.1986, 12 ♀♀, Svanvik, Mellesmo (EIS 169), 20 June - 4 Aug.1986, 1 ♂ 2 ♀♀.

Number of localities: 43.

C. apicalis is recorded here from the first time from BØ, BV, TEI, TEY, TRI, FV and FØ, hence now recorded from most parts of Norway. First Norwegian record of the species was from Tromsø (TRY) (Ringdahl 1954).

C. apicalis is in Sweden distributed from Skåne to Jämtland (Hedström 1995). *C. apicalis* is also recorded from Finland (Hackman 1980), and is reported to occur in Denmark (Petersen & Greve 2001). On the British Isles it is known only from Scotland. The main distribution of *C. apicalis* is the northern parts of Europe.

C. apicalis seems to start the flight period earlier (May) than the other species of the genus *Clusiodes.*

5. *Clusiodes (Clusiaria) geomyzinus* (Fallén, 1823)

Total material: 282 ♂♂ 155 ♀♀ (36 ♂♂ 33 ♀♀ earlier published). **Map 5.**

Ø Halden: Prestbakke (EIS 12), MT, 9 - 30 June 1986, 5 ♂♂ 6 ♀♀, 30 June - 28 July 1986, 1 ♂ 1 ♀. **AK** Asker: Bjørkås (EIS 28), MT, 4 June - 2 July 1995 1 ♂; Lørenskog: Losby (EIS 29), WT, Site 83, 21 May - 21 June 1991, 1 ♂; Rælingen, Losby (EIS 29), WT, Site 11, 25 June - 31 July 1991, 1 ♂ 1 ♀; Nannestad: Nordmoen (EIS 37), MT, 25 June - 28 July 1986, 6 ♂♂ 2 ♀♀, 28 July - 3 Aug. 1986 5 ♂♂ 3 ♀♀. **HES** Ringsaker: Helgøya, Eiksåsen (EIS 45), May 1990, 1 ♂ 2 ♀♀. **BØ** Drammen: Underlia (EIS 28), MT, May 1994, 1 ♀; Ringerike: Sokna, Hovland (EIS 36), MT, 1 June – 3 July 2004, 3 ♂♂ 1 ♀. **BV** Flå: Langtjern (EIS 35), MT, 1 May - 29 June 1986, 4 ♂♂ 4 ♀♀, 29 June - 21 July 1986, 2 ♂♂, 21 July - 3 Aug. 1986, 1 ♀; Ål: Tuftelia (EIS 43), MT, ca. 450 m a.s.l., 21 May - 19 June 2000, 1 ♀; Rollag: Bruhaug (EIS 35), 27 May 1985, 1 ♂, Vårviken (EIS 35), Aug. 1994, 1 ♀. **AAY** Birkenes: Sennumstad (EIS 6), MT, 25 June - 6 Aug.1986, 3 ♂♂ 7 ♀♀. **RI** Hjelmeland: Fosså (EIS 14), MT, 20 June - 11 July 1982, 1 ♂. **HOY** Osterøy: Døsså (EIS 40), 26 June 1982, 1 ♂; Samnanger: Ådland (EIS 40), MT 14 - 28 May 1982, 1 ♂. **HOI** Kvam: near Svevatn (EIS 31), MT, 23 June - 28 July 1998, 1 ♀; Voss: Solbakken (EIS 41), MT, 670 m a.s.l., 8 June - 29 June 1986, 1 ♂, 29 June - 6 Aug.1986, 1 ♀, 15 July - 5 Aug.1991, 1 ♂; Granvin: Granvin (EIS 41), MT, 14 - 28 May 1982, 3 ♂♂ 1 ♀, 28 May - 16 June 1982, 6 ♂♂. **SFY** Naustdal: Naustdal (EIS 58), MT, 28 May - 3 July 1986, 9 ♂♂ 18 ♀♀, 3 - 28 July 1986, 2 ♂♂ 3 ♀♀. **SFI** Luster: Fortundalen, Drægni, Ruskesethaugen, (EIS 60), MT, 21 May – 26 June 2004, 1 ♂, 26 June – 28 July 2004, 2 ♂♂ 1 ♀. **MRY** Hareid: Hareidlandet, near Kråkholen (EIS 75), MT, 10 June - 16 July 1990, 1 ♀; Sykkylven: Andestad (EIS 76), MT, 3 - 25 June 2001, 1 ♂ 1 ♀, Vikedalen (EIS 76), 26 June 2001, 1 ♀. **MRI** Norddal: Fjøra (EIS 77), MT, 23 June - 18 July 1993, 1 ♂ 2 ♀♀; Fjøra, Ytste Furneset (EIS 77), MT, 11 June - 16 July 2000, 1 ♀, Stranda: Lauvvikane EIS 77, MT, 28 May - 6 July 2000, 1 ♀. **STI** Oppdal: Lønset (EIS 79), 2 MT, 450 - 520 m a.s.l., 20 May - 1 June 1992, 1 ♂, 1 - 12 June 1992, 3 ♂♂ 1 ♀, 12 June - 13 Aug. 1992, 12 ♂♂ 11 ♀♀, 24 June - 17 July 1992 10 ♂♂ 2 ♀♀, 17 July - 18 Sept. 1993, 2 ♂♂ 1 ♀; Oppdal: Kongsvoll (EIS 79), 900 - 1100 m a.s.l., 20 - 28 July 1983, 1 ♀ (UZMK). **NTI** Høylandet: Skiftesåa (EIS 107), MT, 2 - 9 July 1988, 2 ♀♀; Lierne: Kveskallen (EIS 108), MT, 7 - 26 June 1986, 1 ♂ 1 ♀, Storbekken (EIS 108), MT, 26 June - 16 July 1986, 2 ♂♂. **NSY** Bodø: Valnes, Skålmoen (EIS 130), 27 July 1987, 1 ♂. **NSI** Rana: Granhei (EIS 123), 1 - 29 June 1986, 10 ♂♂ 11 ♀♀, 29 June - 21 July 1986, 1 ♂. **TRY** Tromsø: Ramfjordnes (EIS 162), MT, May 1991, 77 ♂♂ 3 ♀♀, July 1991, 5 ♂♂, Aug. 1991, 10 ♂♂. **TRI** Målselv: Dividalen, Sletta (EIS 154), MT, 14 - 29 June 1986, 2 ♀♀, 28 July - 3 Aug. 1986, 3 ♂♂. **FV** Alta: Kåfjord, Møllenes (EIS 173), MT, 21 June - 4 Aug. 1996, 1 ♂ 1 ♀. **FØ** Sør-Varanger: Pasvik, Noatun (EIS 160), 26 June - 1 July 1990 1 ♀, Svanvik, Svanhovd (EIS 169), MT, 20 June - 4 Aug. 1986, 36 ♂♂ 20 ♀♀, Svanvik, Mellesmo (EIS 169), MT, 20 June - 4 Aug. 1986, 7 ♂♂ 2 ♀♀.

Number of localities : 48.

C. geomyzinus is here recorded for the first time from Ø, BØ, BV, AAY, SFY, SFI, MRI, STI, NSY, NSI, TRI, TRY & FØ. *C. geomyzinus* has earlier been recorded from Oslo (AK), Flekkefjord (VAY), Sandnes (RY), Forsand (RI), Samnanger (HOY) and Granvin, Kvam, Ulvik and Voss (HOI). Zetterstedt (1848) published one record from Bjerkvik, Narvik NNØ. This specimen is unfortunately on loan from the Zoological Museum, University of Lund and the author has not seen it. *C. geomyzinus* is distributed all over the country and is fairly common. Hedström (1995) gives records of *C. geomyzinus* from almost all over Sweden. *C. geomyzinus* is known from Finland (Hackman 1980), from Denmark (Petersen & Greve 2001) and Scotland (Stubbs 1982). Otherwise it is distributed in C Europe (Soós 1984).

C. geomyzinus was recorded as *Heteroneura geomyzina* (Siebke 1877). However, Siebke´s material has been revised (see above), only three specimens were actually *C. geomyzinus* : Those from **AK** Enebakk: Enebakk (EIS 29) 1 ♀, **HEN**

Åmot (Aamodt): Åmot (EIS 55),1 ♂, and Åmot: Åmot (EIS 55), 6 July 1848 1 ♀, see also C. albimanus and *C. apicalis*. Two females can only be determined as *Clusiodes* sp. (nec *geomyzinus*).

The high number of specimens collected at some localities in the northernmost part of Norway, may indicate that this species occurs quite numerous here.

The flight period seems to be from June to late August.

6. *Clusiodes (Clusiaria) pictipes* (Zetterstedt, 1855)

Total material: 1 ♂. **Map 6**.

TEI Tinn: Håkanes (EIS 26), MT, May 1995 1 ♂.

Clusiodes pictipes is new to Norway. The male genitalia are very similar to those of *C. geomyzinus*, see Tuomikoski (1933). However, the costal wing margin of *C. pictipes* is clouded for less than half of its length, as compared to *C. geomyzinus*, having its costal wing margin clouded all along.

Hedström (1995) reported the species from three Swedish provinces. *C. pictipes* is also recorded from Finland (Hackman 1980) and Germany (Schumann 1999), but not from the British Isles.

7. *Clusiodes (Clusiaria) ruficollis* (Meigen, 1830)

Total material: 13 ♂♂ 18 ♀♀ (earlier published 4 ♂♂ 7 ♀♀). **Map 7**.

AK Asker: Bjerkås (EIS 28), MT, 24 Aug.- 10 Oct. 1995, 1 ♂ 1 ♀. **HES** Ringsaker: Furnes, Sandvold (EIS 45), MT, July 1992, 2 ♂♂ 1 ♀, Aug. 1997, 1 ♀, Helgøya, Hovindsholm (EIS 45), MT, 29 June - 29 July 1991, 2 ♂♂ 1 ♀. **BØ** Hurum: Tofte (EIS 28), MT, 1 May - 29 June 1986, 1 ♂ 1 ♀. **BV** Flå: Langtjern (EIS 35), MT, 1 May - 29 June 1986, 2 ♀♀, 29 June - 21 July 1986, 1 ♀; Ål: Storeteigen (EIS 43), MT, 19 June - 19 July 2000, 1 ♂ 1 ♀. **SFI** Vik: Fresvik (EIS 50), MT, 1 - 17 July 1997, 1 ♀. **STI** Trondheim: Korsvika (EIS 92), 20 July 1987, 1 ♂, Oppdal: Lønset (EIS 79), 2 MT, 450 - 520 m a.s.l., 12 June - 13 Aug. 1992, 1 ♀. **NTI** Stjørdal: Vikan (EIS 92), MT, 23 May - 4 June 1990, 1 ♂. **FØ** Sør:Varanger: Svanvik (EIS 169), MT, 20 June - 4 Aug. 1986, 1 ♀.

Number of localities: 15.

Clusiodes ruficollis was reported as new to Norway (Greve & Midtgaard 1986) from Tjøme (VE) and Kristiansand (VAY). C. ruficollis is here recorded as new to AK, HES, BØ, BV, SFI, STI and FØ.

In Sweden *C. ruficollis* is distributed north to Södermanland (Hedström 1995). It is known from Finland (Hackman 1980), Denmark (Petersen & Greve 2001), and the British Isles (Stubbs 1982: as *C. fascialis*). Otherwise it is known from C Europe (Soós 1984).

The main flight period seems to be from June to August.

8. *Clusiodes (Columbiella) verticalis* (Collin, 1912)

Total material: 36 ♂♂ [8 ♀♀] [3 ♂♂ and [1 ♀] earlier published). **Map 8**.

AK Nesodden: Fagerstrand (EIS 28), LT, 30 - 31 Aug.1994, 1 ♂. **RY** Finnøy: Kirkøy (EIS 14), MT, 16 - 20 July 1987, 1 ♂, 31 Aug.- 7 Sept.1987, 2 ♂♂, Kvitevik (EIS 14), MT, 17 June - 9 July 1993, 1 ♂ [1 ♀], 25 Aug.-10 Sept.1995 1 ♂, 21 Aug. - 23 Okt. 1993 1 ♂ [1♀], Sevheim (EIS 14), MT, 27 July - 21 Aug. 1993, 9 ♂♂ [3 ♀♀]. **HOY** Bømlo: Kalvneset near Olavskolen (EIS 22), 17 - 18 Aug.1992, 1 ♂; Os: Drange (EIS 30), MT, 14 - 26 June 1987, 1 ♂. **HOI** Ullensvang: Espe (EIS 32), J/B, 28 Sept. 1982, 1 ♂, Sekse (EIS 32), J/B, 28 Sept.1982, 1 ♂. **SFY** Hyllestad: Botnen (EIS 48), 25 July - 7 Sept.1999 1 ♂, 25 July - 7 Sept.1999, 3 ♂♂ [1 ♀]. **SFI** Balestrand: Målsnes (EIS 50), 2 MT, 1 - 29 Aug.1998, 1 ♂, 29 Aug.- 4 Oct.1998, 1 ♂; Leikanger: Hamre (EIS 50), J/B 9 Aug. 1982, 1 ♂, CT, 15 Sept. 1982, 4 ♂♂. **MRY** Hareid: Håbakken (EIS 76), MT, 19 - 24 July 1991, 1 ♂ [1 ♀]. **MRI** Norddal: Fjøra (EIS 77), MT, 23 June - 18 July, 1 ♂.

Number of localities: 15.

C. verticalis was first recorded from Norway from Tysvær (RY) (Greve 1983). It has also been recorded from Grimstad (AAY), Etne and Kvam (HOI). *C. verticalis* is new to AK, HOY, SFY, SFI, MRI and MRY. Two specimens from Ullensvang: Espe and Sekse (HOI) were obtained by beating the vegetation; one specimen from Nesodden AK was caught in a light trap. Most of the material was collected late in the year, the flight period from July into late September.

C. verticalis seems to prefer coastal areas, or areas close to larger fjord systems; in Sweden it is known from the southern province of Scania only (Andersson, 1971, Hedström 1995); it is not listed from Finland (Hackman 1980); but, however, recorded from Denmark (Petersen & Greve 2001). There are scattered records from England, Scotland and Wales (Stubbs 1982). It is widely distributed in Europe (Soós 1984).

Genus *Clusia* Haliday, 1838

9. *Clusia flava* (Meigen, 1830)

Total material: 117 ♂♂ 175 ♀♀ (3 ♂♂ 8 ♀♀ earlier published). **Map 9.**

Ø Halden: Prestbakke (EIS 12), MT, 30 June - 28 July 1986, 1 ♀, Hvaler: Ørekroken, 18 July 1986, 2 ♀♀. **AK** Nesodden: Fagerstrand (EIS 28), LT, 20 - 21 Aug. 1994, 1 ♂, 23 - 24 Aug. 1994, 1 ♂, 28 - 29 Aug. 1994, 1 ♂, 20 - 21 July 1997, 1 ♂, 4 - 5 Aug. 1997, 1 ♂, 9 - 10 Sept. 1998, 1 ♂, 14 - 15 Sept. 1998, 1 ♂, 19 - 20 Aug. 2001, 2 ♂♂, 30 - 31 Aug. 2001, 1 ♂; Enebakk: Vangen (EIS 29), WT, Site 48, 24 June - 29 July 1991, 1 ♂, Nordre Bøler (EIS 29), MT, July 1996, 2 ♀♀, Aug. 1996, 1 ♀; Nannestad: Nordmoen (EIS 37), MT, 25 June - 24 July 1986 1 ♀. **HES** Ringsaker: Furnes, Sandvoll (EIS 45), MT, July 1992, 2 ♂♂ 1 ♀, July 1997, 2 ♀♀, Aug.1997, 2 ♀♀, Helgøya, Eiksåsen (EIS 45), MT, June 1990, 1 ♀, July 1990, 1 ♂ 2 ♀♀, Helgøya, Hovindsholm (EIS 45), MT, 27 June - 27 July 1991, 1 ♂ 3 ♀♀; Eidskog: Bolfoss (EIS 29), MT, 24 June - 16 Aug. 1990, 1 ♂. **HEN** Åmot: Borregårdsvelta (EIS 55), June 1998, 1 ♀. **BØ** Drammen: Underlia (EIS 28), MT, June 1992, 1 ♀; Hurum: Tofte (EIS 28), MT, 17 June - 17 July 1985 1 ♂ 2 ♀♀, 17 July - 8 Aug. 1985 2 ♂♂; Ringerike: Sokna, Hovland (EIS 36), MT, 1 June – 3 July 2004, 2 ♂♂, 3 July – 13 Aug. 2004, 5 ♂♂. **BV** Ål: Storeteigen (EIS 43), MT, 19 June - 19 July 2000, 2 ♂♂ 2 ♀♀, 18 July - 18 Aug. 2000 1 ♂ 5 ♀♀, 18 Aug. - 18 Sept. 2000, 1 ♀, Tuftelia (EIS 43), MT, appr. 450 m a.s.l., 18 June - 18 July 2000, 1 ♀, 18 July - 18 Aug. 2000 1 ♂ 1 ♀. **VE** Hedrum: Seierstad (EIS 19), 11 July 1986, 1 ♀. **TEY** Porsgrunn: Brevik, Dammane (EIS 11), MT, 13 - 27 June 1988, 4 ♂♂ 5 ♀♀, 27 June - 12 July 1988, 1 ♂ 2 ♀♀, 12 - 20 July 1988, 1 ♀, Hitterødbekken, Kjørholt (EIS 11), MT, 13 June - 11 July 1988, 2 ♀♀. **TEI** Tinn: Håkanes (EIS 26), MT, Aug. 1995, 1 ♀, Sept.1995 1 ♀, Rjukan (EIS 26), MT, July 1995, 1 ♂ 1 ♀; Kviteseid: Kviteseid (EIS 17), LT, 11 - 20 July 1988, 2 ♂♂. **AAY** Birkenes: Sennumstad (EIS 6), MT, 25 June - 6 Aug. 1986, 2 ♂♂ 6 ♀♀. **AAI** Bygland: Heddevika (EIS 9), MT, 16 May - 11 June 1997, 2 ♂♂ 3 ♀♀, 11 June - 4 July 1997, 4 ♂♂ 15 ♀♀, 4 July - 31 Aug.1997, 3 ♂♂ 3 ♀♀, 1 - 29 July 1998, 1 ♀. **VAY** Farsund: Straumen, (EIS 1), 13 June - 8 July 1999, 1 ♀. **RY** Finnøy: Kirkøy (EIS 14), 1 July 1986, 1 ♂, 11 July 1987, 1 ♂, MT, 27 July - 2 Aug.1987, 1 ♂, 26 May - 26 June 1995, 2 ♂♂ 1♀, Kvitevik, MT, 29 May - 17 June 1993, 1 ♀, 9 - 27 July 1993, 1 ♂, Sevheim, MT, 29 May - 17 June 1993, 2 ♂♂, 27 July - 21 August 1993, 1 ♂, Sevheimsheia, MT, 9 July - 5 Aug. 1994, 1 ♀; Karmøy: Våge, Grodvatn (EIS 13), MT, July 1994, 1 ♀, Midtstokke, MT, June 1995, 1 ♀. **RI** Hjelmeland, Mosnes (EIS 14), JB, 19 Aug. 1982, 1 ♂, 2 Sept. 1982, 1 ♂. **HOY** Bergen (Fana): at Mildevann (EIS 30), MT, 19 June - 27 July 2005, 1 ♀; Samnanger: Tysse (EIS 40), MT, 23 Aug. - 5 Sept.1980, 2 ♂♂, Ådland (EIS 40), MT, 16 June - 2 July 1982, 1 ♀; Os: Drange (EIS 30), MT, 26 June - 16 July 1988, 1 ♂, Gåssand, MT, 24 May - 7 July 1993, 1 ♀, Gåssand, Raudli, MT, 28 June - 12 July 1990, 4 ♂♂ 1 ♀, 6 - 28 Aug. 1990, 6 ♂♂ 7 ♀♀, Åsen, MT, 31 May - 28 June 1990, 2 ♂♂ 1 ♀. **HOI** Granvin: Between Ålvik and Kvanndal (EIS 41), MT 28 May - 16 June 1982, 1 ♀; Kvam: Berge Nature Reserve (EIS 31), MT, 6 June - 4 July 2000, 1 ♀, 4 July - 6 Aug. 2000, 1 ♀, near Svevatn (EIS 31), MT, 28 May - 1 July 1997, 1 ♀, 23 June - 28 July 1998, 1 ♀. **SFY** Hyllestad: Botnen (EIS 48), 2 MT, 21 May - 21 June 1999, 2 ♂♂ 1 ♀, 21 June - 25 July 1999, 1 ♂ 8 ♀♀, 25 July - 7 Sept.1999, 6 ♂♂; Jølster: 200 m West of Vassenden (EIS 58), MT, 6 - 11 July 1998, 3 ♀♀;. **SFI** Aurland; Flåm, Indrelid (EIS 50), MT, 26 June - 17 July 2000 1 ♀; Balestrand, Målsnes (EIS 50), MT, 14 June - 1 Aug.1998, 4 ♀♀, 1 - 29. Aug.1998, 1 ♀; Leikanger: Gjerde (EIS 50), 30 Sept. 1982 J/R, 1 ♂; Luster: Fortundalen, Drægni, Ruskesethaugen (EIS 60), MT, 26 June – 28 July 2004, 1 ♂ 4 ♀♀, Fåbergstølgrandane, 520 m a s l, MT, 23 - 24 June 1988, 5 ♂♂ 4 ♀♀, Øyastrandi, MT, 24 June - 12 July 1988, 1 ♂ 1 ♀; Vik: Fresvik (EIS 50), MT, 1 - 17 July 1997, 18 ♂♂ 5 ♀♀. **MRY** Hareid: Hareidlandet, Kråkholen (EIS 75), MT, 10 June - 16 July 1990, 6 ♀♀, 16 July - 5 Aug. 1990 1 ♀; Sykkylven: Andestad (EIS 76), MT, 25 June - 1 Aug. 2001, 1 ♀, Gjevenes, MT, 11 June - 11 Aug. 2001, 1 ♀,11 Aug. - 30 Sept. 2001, 1 ♀. **MRI** Norddal: Fjøra (EIS 77), MT, 23 June - 18 July 1993, 1 ♂ 2 ♀♀, 18 July - 11 Sept. 1993, 1 ♂4 ♀♀, Fjøra Ytste Furneset (EIS 77),

MT, 5 May - 11 June 2000, 1 ♀; Stranda: Lauvvika (EIS 77), MT, 28 May - 6 July 2000, 2 ♂♂ 1 ♀, 6 July - 20 Aug. 2000, 2 ♂♂. **NTI** Høylandet: Skiftesåa (EIS 107), MT, 2 - 9 July 1988, 2 ♀♀; Lierne: Kveskallen (EIS 108), MT, 14 July - 18 Aug. 1986, 4 ♀♀. **NSY** Bodø: Falkflaugvika (EIS 130), 14 July 1987, 1 ♀, Kronli, Urskar, MT, 15 July - 27 July 1986, 1 ♀. **TRY** Tromsø: Ramfjordnes (EIS 162), MT, July 1991, 1 ♀, Aug.1991, 1 ♀. **TRI** Målselv: Kirkedalen, Kjosvoll (EIS 147), MT, primo July - 25 July 1992, 9 ♀♀, 25 July - 10 Aug. 1992, 1 ♀, 10 - 25 Aug. 1992, 1 ♀.

Number of localties: 66.

C. flava is recorded here for the first time from HES, HEN, BØ, VE, TEY, TEI, AAY, RY, SFI, MRY, MRI, NTI, NSY, TRY and TRI; it is previously known from Frogn and Bærum (AK), Flekkefjord (VAY), Hjelmeland (RI), Eidfjord (HOI) and Bergen (HOY) (Greve & Midtgaard 1986). *C. flava* is rarely collected in high numbers from one locality, however, it seems to be common compared to the other clusiid-species. In Sweden it is known only from two provinces (Hedström 1995), but it is fairly common in Denmark (Petersen & Greve 2000). It is recorded from Finland (Hackman 1980) and seems common in the southern parts of the British Isles (Stubbs 1982), otherwise it has a wide distribution in Europe, as well as Japan (Sòos 1984).

The major part of the material of C. flava has been collected by Malaise traps, however, one light trap at Nesodden: Fagerstrand collected ten specimens in eight years. One specimen from SFI Leikanger: Gjerde was beaten from hazel (*Corylus avellana*). The main flight period is from June to August.

Genus *Paraclusia* Czerny, 1902

10. *Paraclusia tigrina* (Fallén, 1820)

Total material: 6 ♂♂ 7 ♀♀ (2 ♂♂ 4 ♀♀ earlier published). **Map 10.**

AK Nesodden: Fagerstrand (EIS 28), LT, 4 - 5 Oct. 1993, 1 ♂. **BØ** Ringerike: Sokna, Hovland (EIS 36), MT, 3 Sept.- 11 Okt. 2004, 1 ♂. **TEI** Tinn: Håkanes (EIS 26), MT, Sept. 1995, 1 ♂. **AAI** Bygland: Heddevika (EIS 9), MT, 27 July - 5 Sept. 1998, 1 ♂ 2 ♀♀. **SFI** Luster: Fortundalen, Drægni, Ruskesethaugen (EIS 60), MT, 2 Sept.- 6 Okt. 2004, 1 ♀.

Number of localities: 8

Paraclusia tigrina recorded here for the first time from BØ, TEI, AAI and SFI, and has only been recorded from five localities since 1986. Previous material has only been collected from AK, viz. Oslo: Tøyen, June 1854, Bærum: Ostøya and Frogn: Håøya (Siebke 1877, Greve & Midtgaard 1986). Siebke collected one specimen in June, all other specimens have been collected from late July, August and as late as October. Hedström (1995) reported *P. tigrina* from six provinces in S Sweden northwards to Uppland, but mostly older records. Hedström´s new records were from the autumn. *P. tigrina* is red listed in Sweden (Ehnström et. al 1993). It is recorded from Finland (Hackman 1980), but not from Denmark.

P. tigrina has been considered to be a very rare, and endangered species on the British Isles. In recent years it has been reported from some additional localities in the SE England (Stubbs 1982, Howe et al. 2000, and Jones 2000).

DISCUSSION

The known larvae of the Clusiidae live in rotten logs or stumps of various deciduous trees, and in the galleries excavated by other insects. The adults are usually found in or near forests, around trunks of old or rotten trees.

Saproxylic invertebrates´ role in nature is to decompose the wood of naturally dying trees. Saproxylic invertebrates are of great interest in conservation perspective in Europe (Haring & Alexander 1994), due to the fact that several saproxylic species are declining markedly. The evaluation of sites for wildlife conservation has traditionally been based on botanical and ornithological assessments, however, saproxylic invertebrates are suggested for use when selecting and evaluating areas of relic forests (Speight 1989). Clusiidae larvae are saproxylic, and will therefore be a useful group.

The number of species are fairly low, males and most of the females can be determined with the keys which are present today, see under Introduction.

Before 1975, few authors had mentioned these flies from Norway, and around ten specimens were deposited in Norwegian museums. A survey by Greve & Midtgaard (1986) raised the number to 143, mainly because the increasing use of Malaise-traps is a very effective collecting method of Clusiidae. The main part of the material presented here is collected with Malaise-traps, only few specimens have been netted, collected with pitfall-traps, light-traps or by jarring/beating the vegetation.

Based on our present knowledge it is possible to determine which clusiid species are rare, and which species which can be considered more common or fairly common in our country. Habitats rich in Clusiidae, should be considered interesting in conservational view as they indicate old and untouched trees or forest. Such areas could indicate a possible presence of other saproxylic and rare insects, and could be used in evaluation of relic forest parts.

Clusiodes geomyzinus and *Clusia flava* are definitivly the most common species among the ten species listed above, both distributed in most parts of the country (Map 5 and 8). While most specimens of both species have been collected in the lowlands, *C. geomyzinus* has also been collected in alpine areas, but rarely, and it has a wide distribution in Troms and Finnmark. *C. flava* has been recorded north to Troms only, and in S Norway up to about 500 m a.s.l. *C. flava* is very rarely collected in large numbers. 292 specimens of *C. flava* has been collected from 66 localities, a high number of localities compared to a much higher number of specimens of *G. geomyzinus* collected from only 48 localities. The ratio males/females is also different, twice as many males have been caught of *C. geomyzinus* compared to the number of females. As to *C. flava*, females caught are dominating (117 ♂♂ to 175 ♀♀).

C. flava is one of the few species caught in light traps. At AK Nesodden: Fagerstrand, *C. flava* was repeatedly collected, ten males all together: 3 in 1994, 2 in 1997, 2 in 1998 and 3 in 2001. The trap was hung one meter above the ground at precisely the same location each year from 1984 and checked for Clusiidae every year since 1994. The trap was situated in an edge habitat between old coniferous forest, temperate deciduous forest, open grassland and a garden. All specimens were males, interesting as males of *C. flava* usually are more scarce than females in other types of traps. For description of the locality see Kobro (1991).

The three common species *Clusiodes apicalis, C. geomyzinus* and *Clusia flava* are, together with *C. ruficollis*, the only species occurring in the three northernmost Norwegian provinces.

As much as 282 males and 155 females of *C. geomyzinus* have been caught in 46 localities, the highest number of specimens of all the ten species of Clusiidae caught in Norway. Even in the northern provinces there are a high number of specimens caught at some localities, indicating dense populations. Highest number of specimens collected during one month of Malaise trapping were in Tromsø: Ramfjordnes (TRY), 80 specimens (77 ♂♂, 3 ♀♀).

Dovre, Kongsvoll (STI) is the highest situated locality for *C. geomyzinus* (between 900 and 1100 m a.s.l. This record, however, was not included in Greve et al. (1987). Two other highland localities for the species were Voss: Mjølfjell, Solbakken (HOI), 670 m a.s.l., and Oppdal: Lønset (STI), 450 m a.s.l. & 520 m a.s.l.. The habitat at Mjølfjell was subalpine birch forest with a few pines and some *Salix* sp., at Lønset pine forest with some deciduous trees.

C. apicalis is the third most common species, representing 177 specimens, and the second species caught at Dovre, 1000 m a. s. l., the highest situated locality (Greve et al. 1987).

The seven remaining species listed above are, exception for *C. ruficollis*, recorded only from Southern and Central Norway, two of them are represented by more than fifty specimens.

Eighty-eight specimens of *C. caledonicus* were collected, but in relatively few localities (13), and one quarter of the material, twenty-four specimens, was collected at one single locality: Hå: Ogna (RY). The northernmost locality is in the southern areas of Sør-Trøndelag. In Sweden records of *C. caledonicus* is from Dalarna, a little south of Sør-Trøndelag (Hedström 1995).

Eighty-two specimens of *C. albimanus* have been collected in 26 localities, the northernmost in Møre og Romsdal province. The northernmost locality in Sweden for *C. albimanus* is in Ångermanland (Hedström 1995), at the latitude of Møre og Romsdal. Hence both *C. albimanus* and *C. caledonicus* should be considered as southern species at the Scandinavian peninsula.

From the British Isles Stubbs (1982) describes *C. albimanus* as a common, southern species, but *C. caledonicus* is here apparently confined to the Scottish highlands.

Thirty-one specimens of *C. ruficollis* and forty-four specimens of *C. verticalis* were collected, both probably not very common. For *C. ruficollis* the northernmost locality is an isolated record from Eastern Finnmark, otherwise it is distributed southwards from Nord-Trøndelag (Map 7). From W Norway there is only one record from Fresvik in the Sognefjord area. The number of localities is 15. According to Hedström (1995) *C. ruficollis* is known from the southeastern parts of Sweden.

C. verticalis has been collected north to Møre og Romsdal, obviously a species located in coastal and fjord areas (Map 8). In Sweden there is only records from the southernmost parts, the province Skåne (Hedström 1995). The species is not known from Finland (Hackman 1980), and is rare in Denmark (Petersen & Greve 2001). Hence, the main known distribution in Fennoscandia and Denmark seems to be in Norway, the outer parts of Møre og Romsdal being a north-western outpost in Europe. The Norwegian distributional area represents an important part of the known distributional area of this species.

Three species should be considered as rare. *C. pictipes* is here reported as new to Norway and from one locality only. It is probably rare in Sweden as well, there are no new records besides the three provinces mentioned by Hedström (1995). The distributional area outside Fennoscandia lies in the north of Europe.

Paraclusia tigrina is redlisted in some countries, including Sweden (Ehnström et al. 1993), see also Hedström (1995), and should probably be so in Norway as well. Its size and the spotted wings is easily observable in the field. However, species which flies in late autumn are less collected.

Also *Hendelia beckeri* is a fairly rare species. Only twenty-four specimens were collected. Its distribution is scattered in southern and middle Norway, the majority of the ten localities are from Western Norway, in particular the Hardangerfjord (HO) and all localities are in coastal and fjord areas (Map 1), northernmost Northern Tröndelag. In Sweden *Hendelia beckeri* has been recorded from one province only (Hedström 1995).

Three species of Clusiidae occurring in NW Europe have hitherto not been recorded from Norway: *Heteromeringia nigrimana* Loew has in Sweden been recorded from two southern provinces (Hedström 1995), *Clusiodes* (*Clusiaria) freyi* Tuomikoski, 1933 is known from Finland and northern Russia (Soós 1984), and *Clusiodes (Clusiodes) gentilis* (Collin, 1912) has a more southern distribution (Collin, 1912), and is known

from the British Isles, Poland, Finland and Russia (Soós 1984), but not yet from the Scandinavian peninsula or Denmark.

Only short notes have been made on the flight periods for the different species. However, most of the species are flying from June to August. Some specimens probably start early in May and some are collected in late September. *C. verticalis* seems to have more specimens caught in late autumn than the other species.

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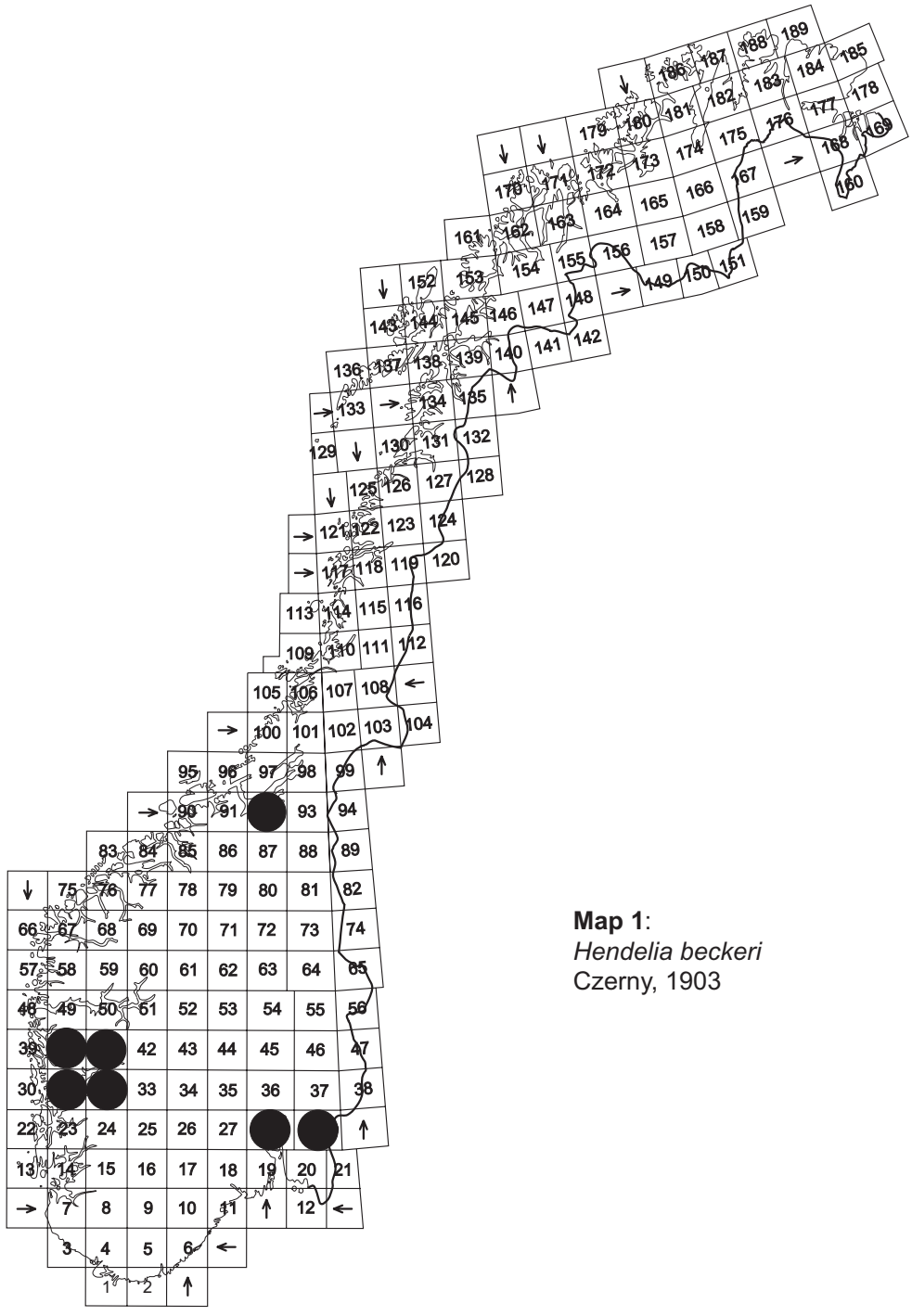
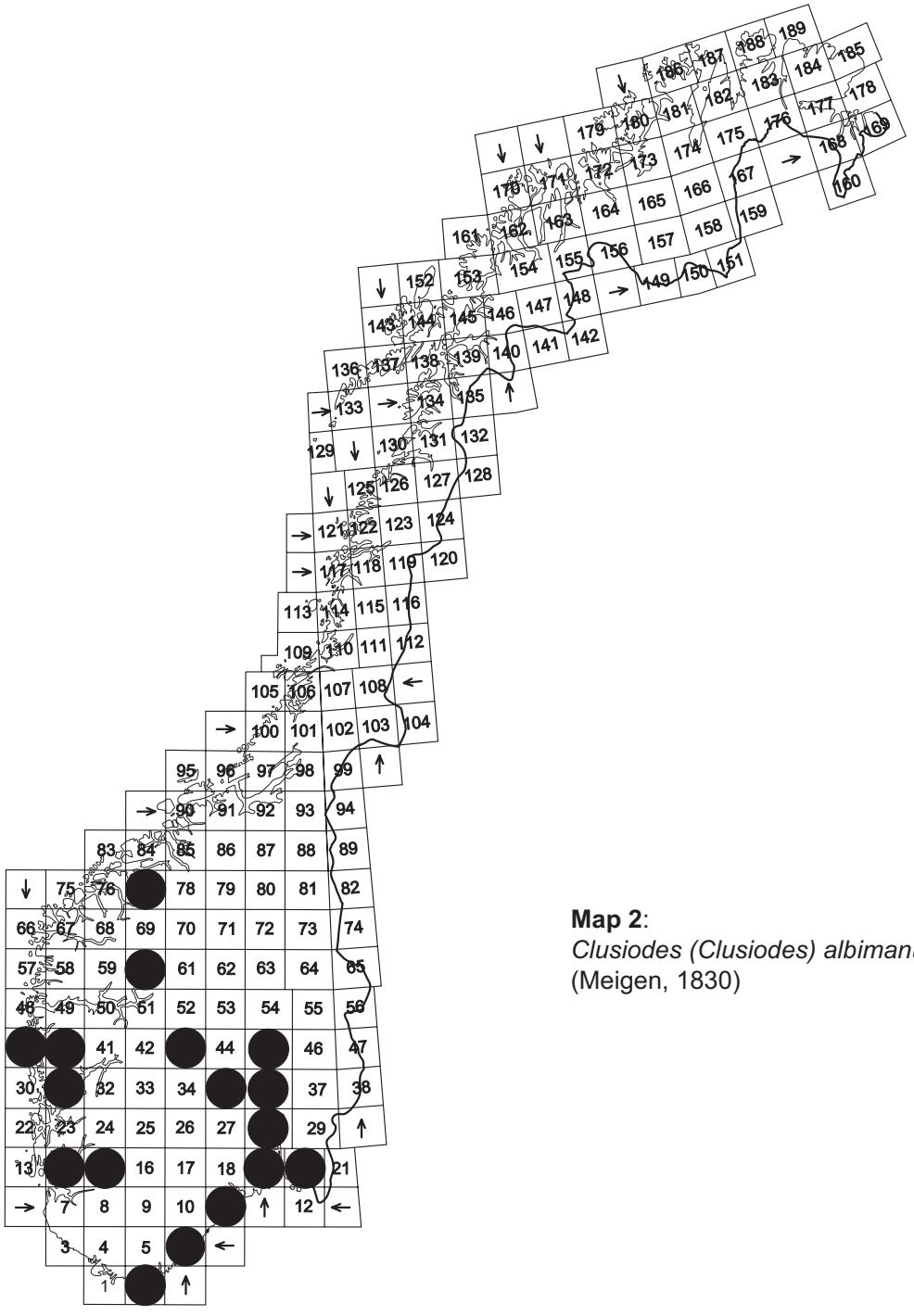
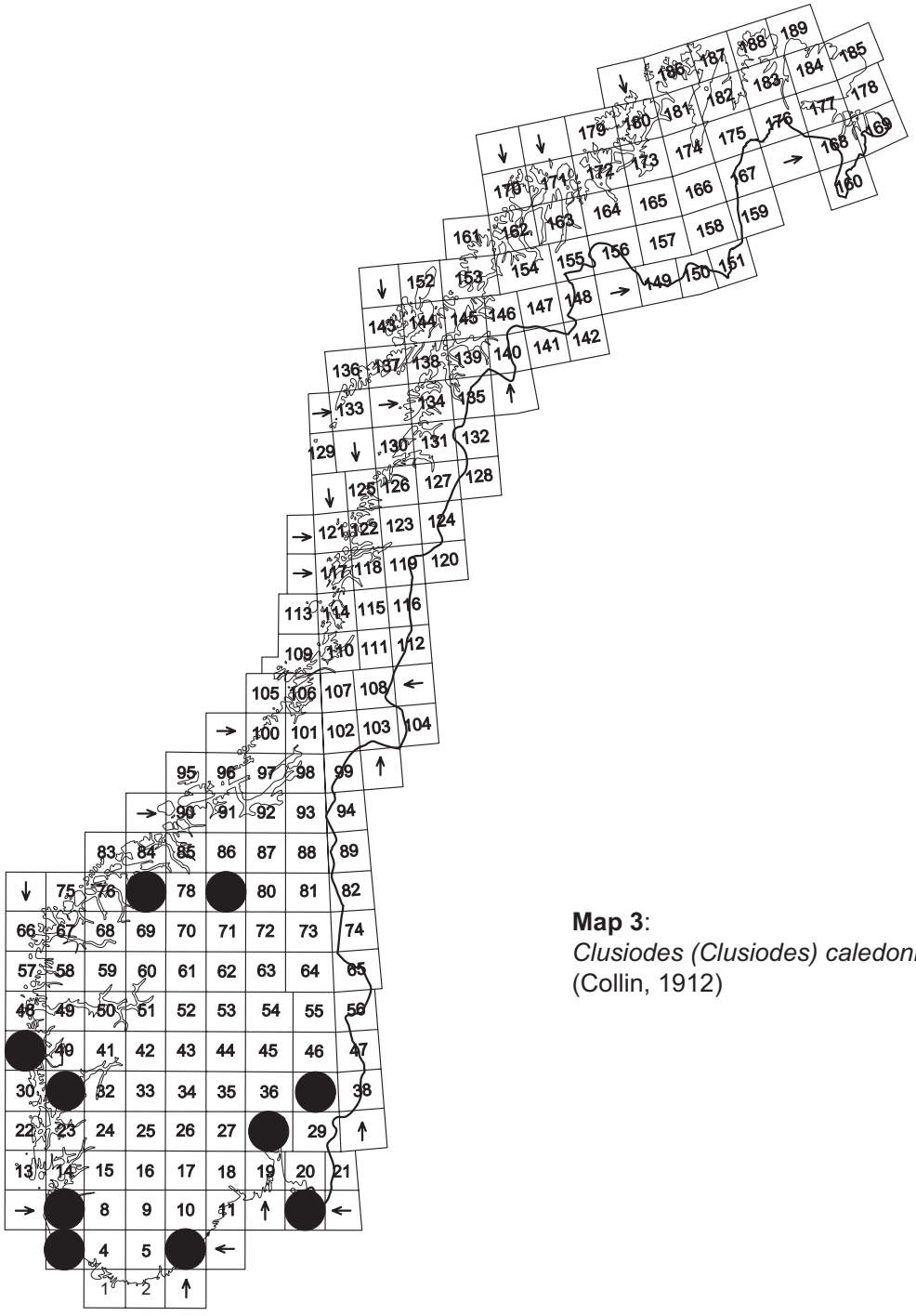


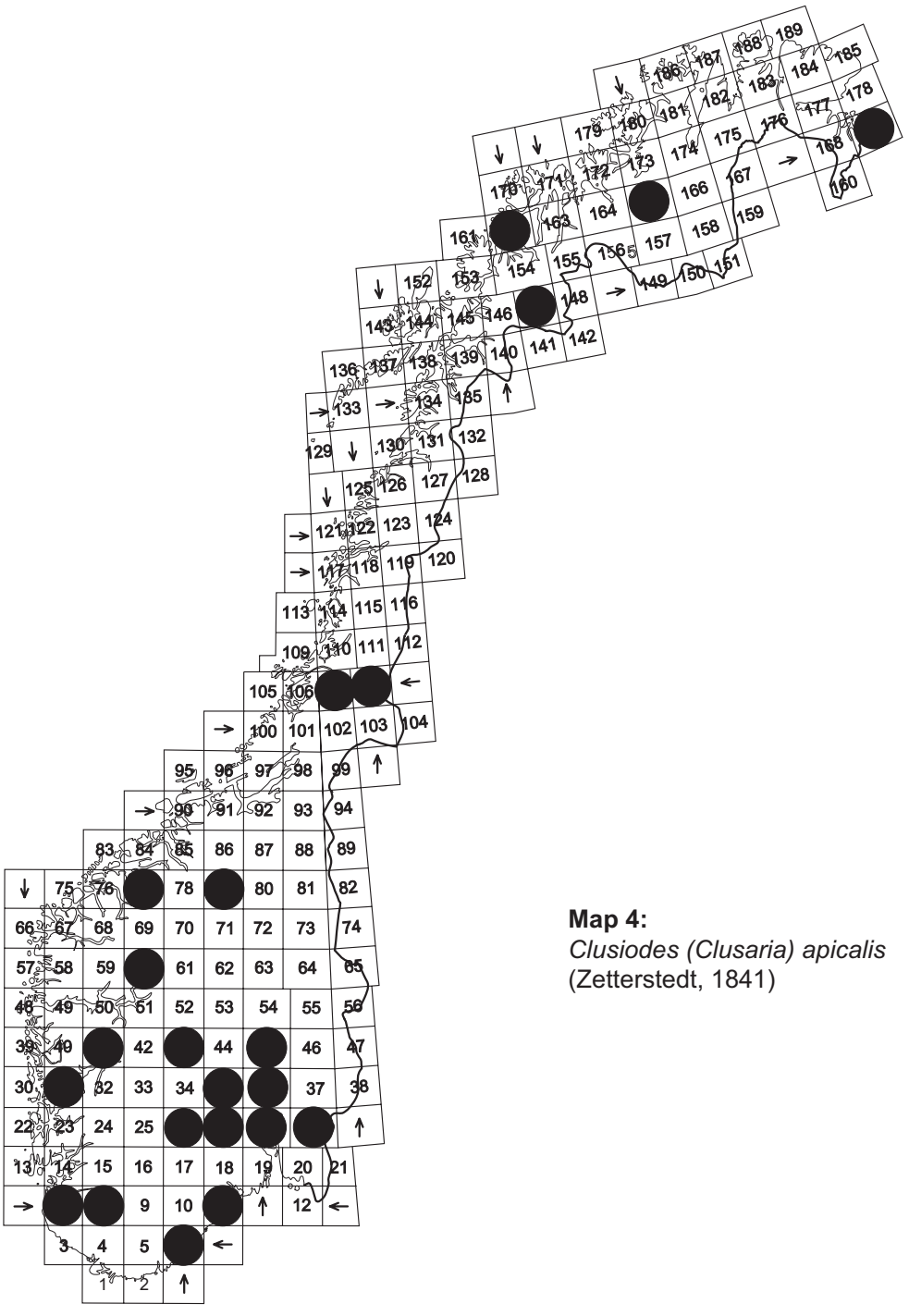
Map 1:
Hendelia beckeri
Czerny, 1903



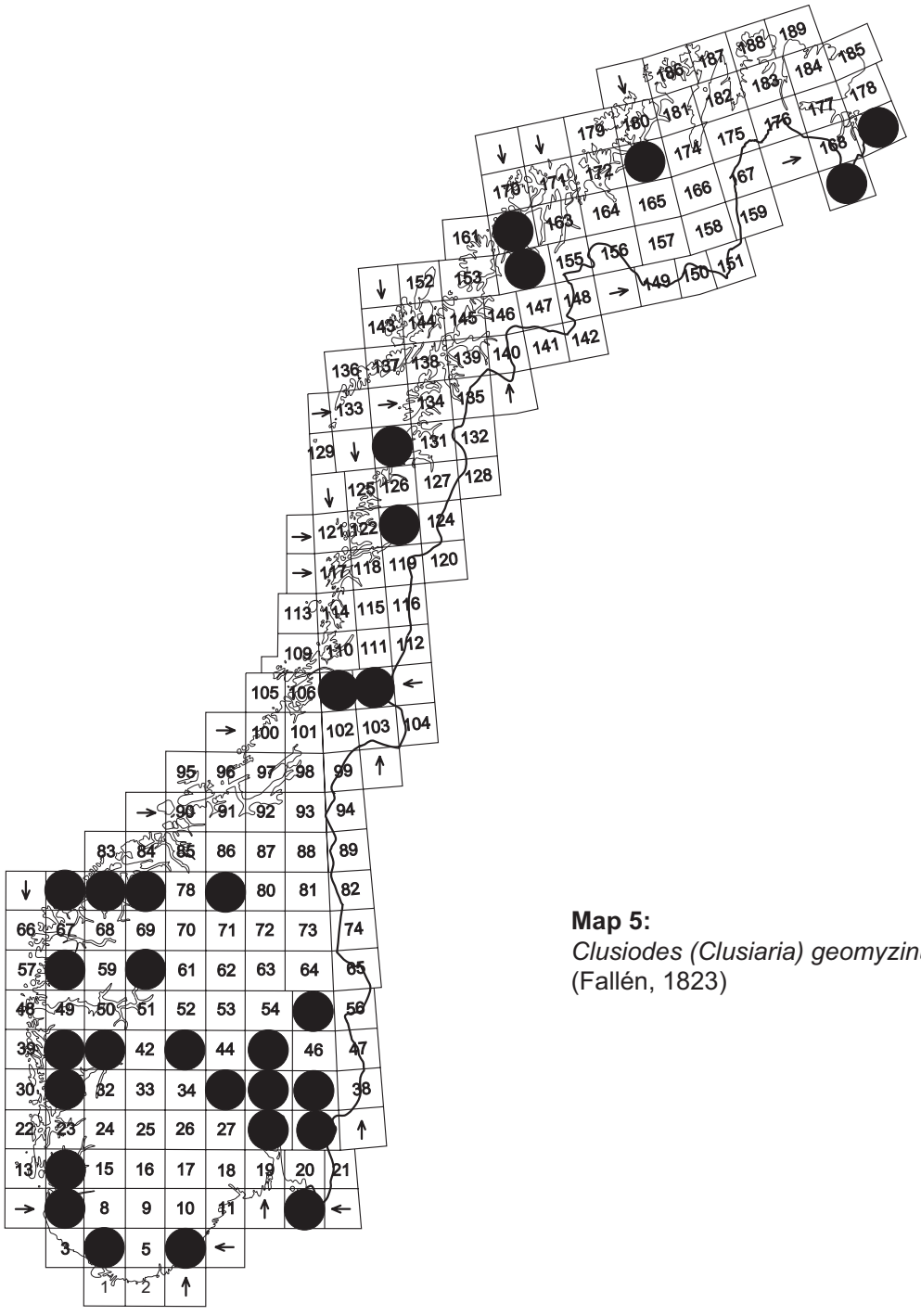
Map 2:
Clusiodes (Clusiodes) albimanus
(Meigen, 1830)



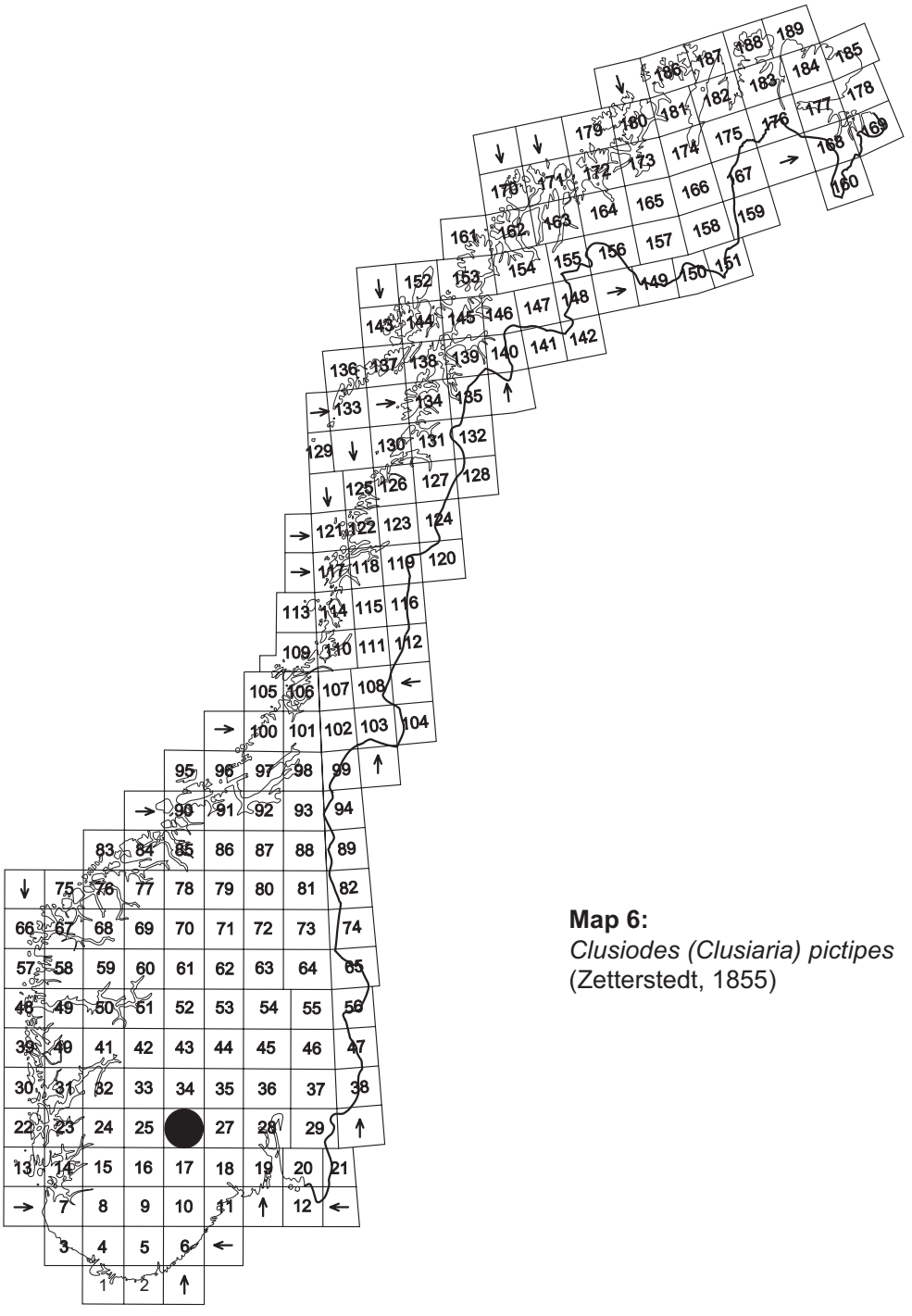
Map 3:
Clusiodes (Clusiodes) caledonicus
(Collin, 1912)



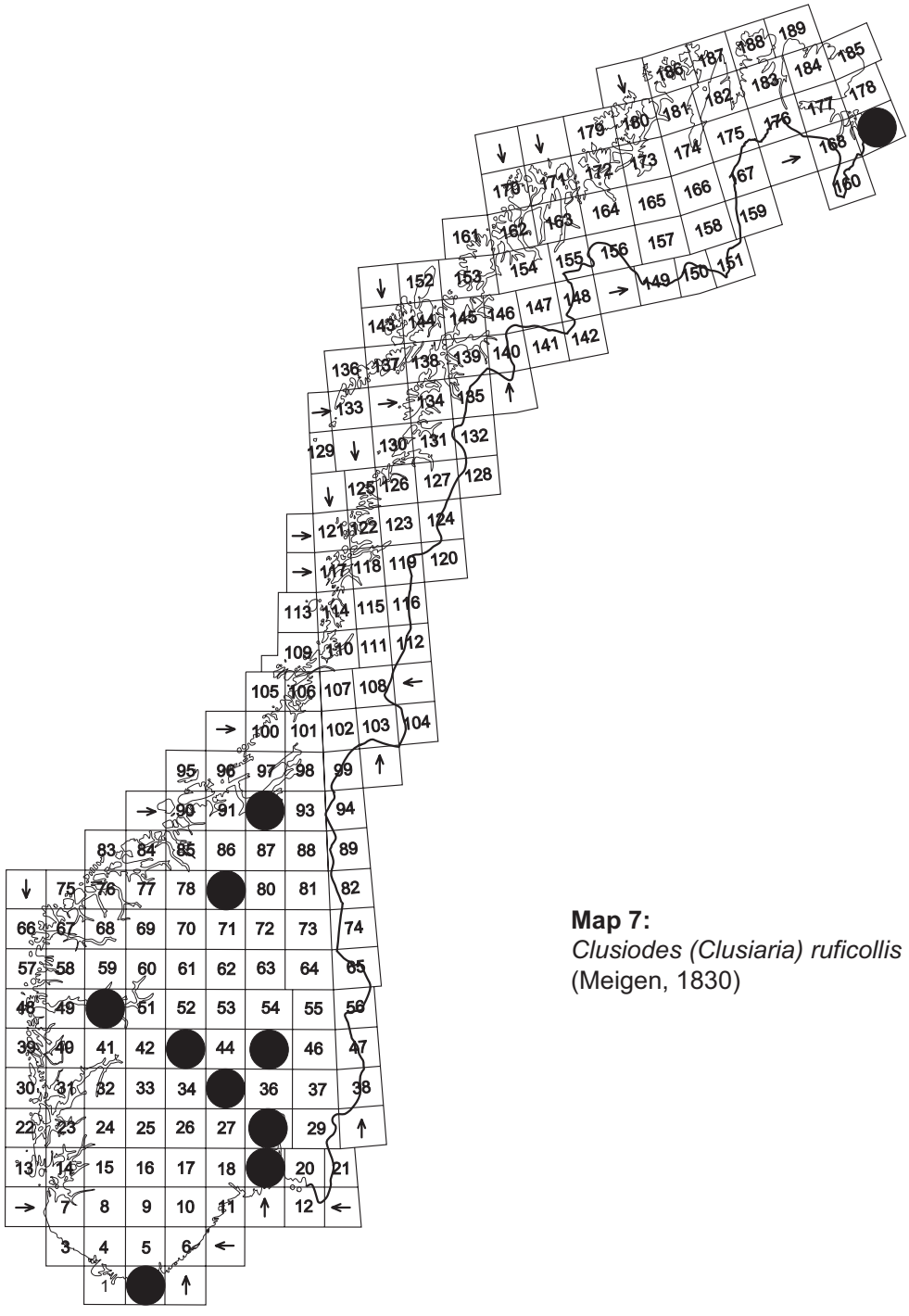
Map 4:
Clusiodes (Clusaria) apicalis
(Zetterstedt, 1841)



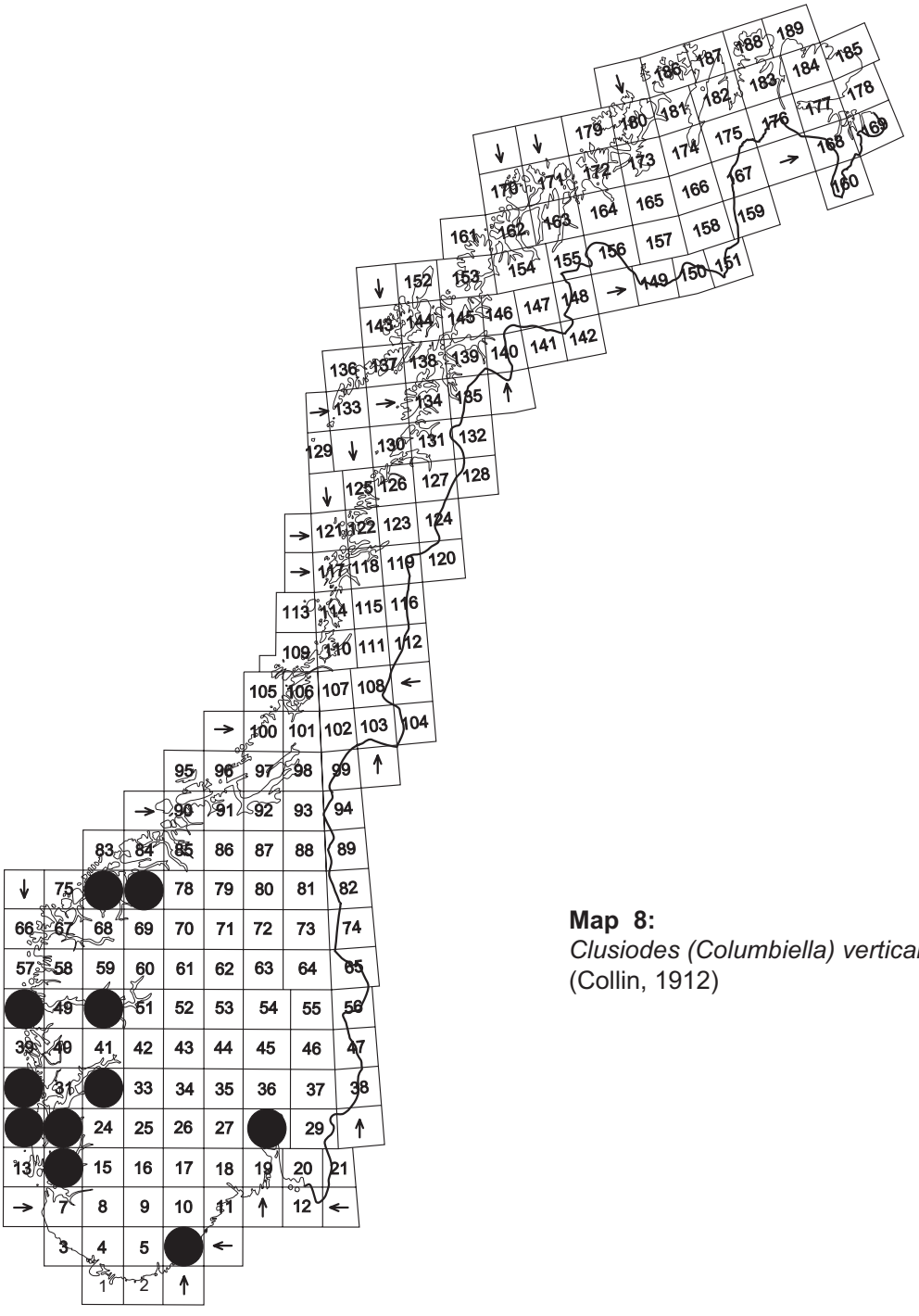
Map 5:
Clusiodes (Clusiaria) geomyzinus
(Fallén, 1823)



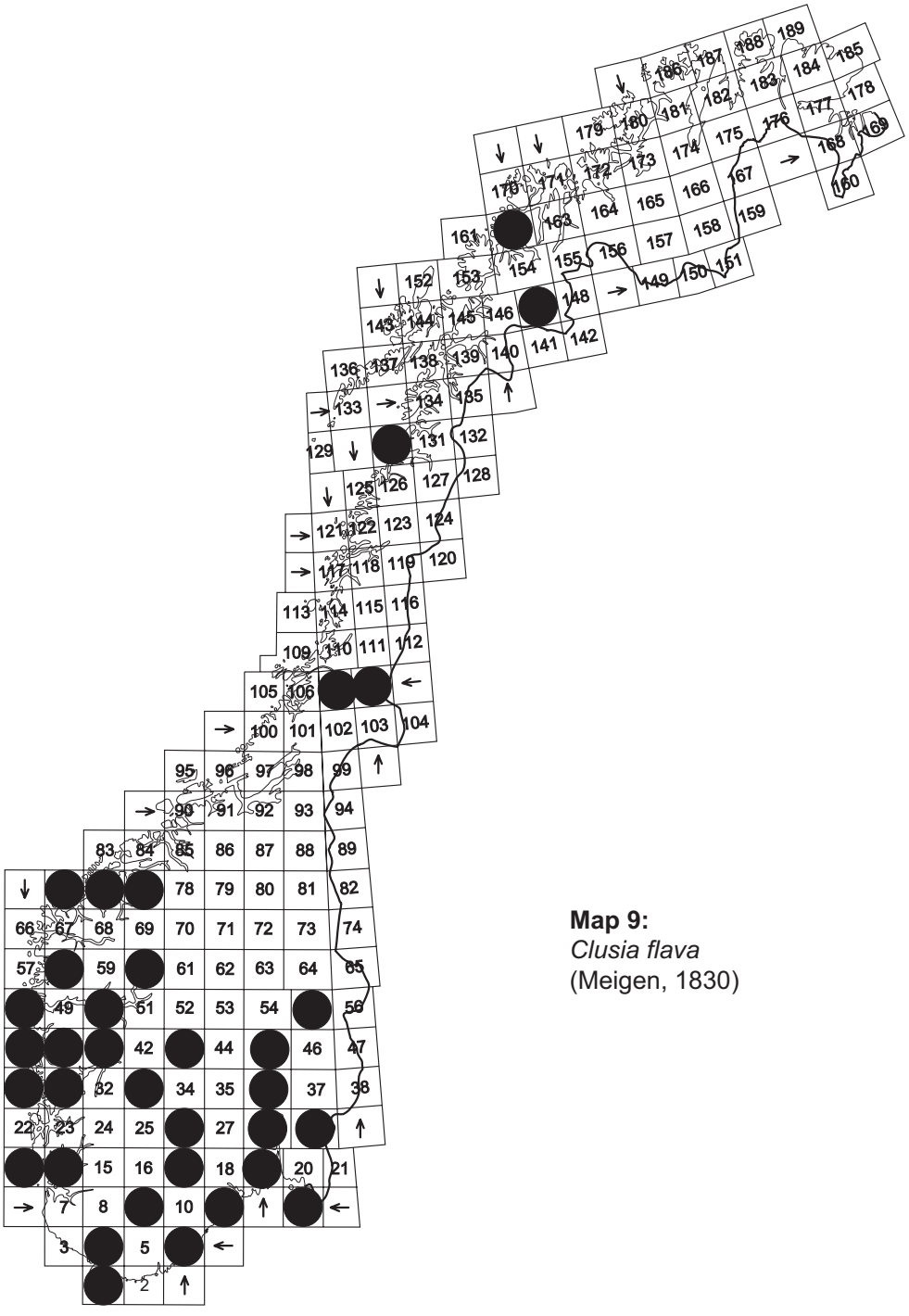
Map 6:
Clusiodes (Clusiaria) pictipes
(Zetterstedt, 1855)



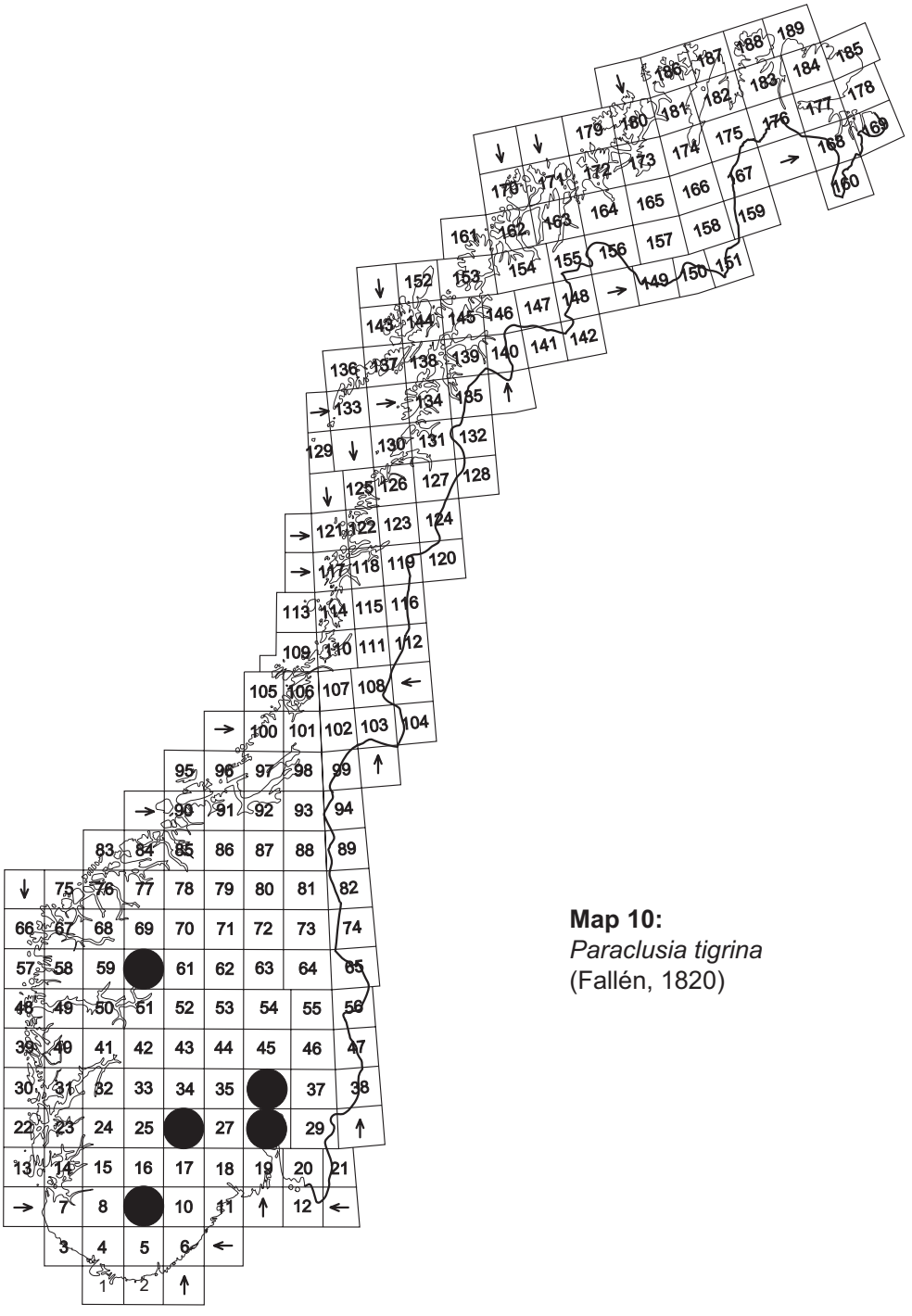
Map 7:
Clusiodes (Clusiaria) ruficollis
(Meigen, 1830)



Map 8:
Clusiodes (Columbiella) verticalis
(Collin, 1912)



Map 9:
Clusia flava
(Meigen, 1830)



Map 10:
Paraclusia tigrina
(Fallén, 1820)

CHECKLIST

Clusiidae

	Ø	AK	HES	HEN	OS	ON	BØ	BV	VE	TEY	TEI	AAY	AAI	VAY	VAI	RY	RI	HOY	HOI
Hendelia																			
H. beckeri	Ø	AK	HES	-	-	-	BØ	-	-	-	-	-	-	-	-	-	-	HOY	HOI
Clusiodes																			
C. albimanus	-	AK	-	-	-	-	BØ	BV	-	-	-	-	-	VAY	-	RY	-	HOY	HOI
C. caledonicus	-	AK	-	-	-	-	BØ	-	-	-	-	AAY	-	-	-	-	-	HOY	-
C. apicalis	-	AK	-	-	-	-	BØ	BV	-	TEY	TEI	-	-	-	-	-	RI	-	HOI
C. pictipes	-	-	-	-	-	-	-	-	-	-	TEI	-	-	-	-	-	-	-	-
C. geomyzinus	Ø	AK	-	HEN	-	-	BØ	BV	-	-	-	AAY	-	VAY	-	RY	RI	HOY	HOI
C. ruficollis	-	AK	HES	-	-	-	BØ	BV	VE	-	-	-	-	VAY	-	-	-	-	-
C. verticalis	-	AK	-	-	-	-	-	-	-	-	-	AAY	-	-	-	RY	-	HOY	HOI
Clusia																			
C. flava	Ø	AK	HES	HEN	-	-	BØ	BV	VE	TEY	TEI	AAY	AAI	VAY	-	RY	RI	HOY	HOI
Paraclusia																			
P. tigrina	-	AK	-	-	-	-	BØ	-	-	-	TEI	-	AAI	-	-	-	-	-	-

	SFY	SFI	MRY	MRI	STY	STI	NTY	NTI	NSY	NSI	NNØ	NNV	TRY	TRI	FV	FI	FN	FØ
Hendelia																		
H. beckeri	-	-	-	-	-	-	-	NTI	-	-	-	-	-	-	-	-	-	-
Clusiodes																		
C. albimanus	-	-	-	MRI	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C. caledonicus	-	-	-	MRI	-	STI	-	-	-	-	-	-	-	-	-	-	-	-
C. apicalis	-	-	-	MRI	-	STI	-	NTI	-	-	-	-	TRY	TRI	-	-	-	FØ
C. pictipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C. geomyzinus	SFY	SFI	MRY	MRI	-	STI	-	NTI	NSY	NSI	-	-	TRY	TRI	FV	-	-	FØ
C. ruficollis	-	SFI	-	-	-	STI	-	NTI	-	-	-	-	-	-	-	-	-	FØ
C. verticalis	SFY	SFI	MRY	MRI	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clusia																		
C. flava	SFY	SFI	MRY	MRI	-	-	-	NTI	NSY	-	-	-	TRY	TRI	-	-	-	-
Paraclusia																		
P. tigrina	-	SFI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTES:

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Localities. In faunistic papers the names of Norwegian localities should be according to K.A. Økland (1981), Fauna (Oslo) 34, 167-178, and preferably the EIS number should be added.

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Borror, D.J., Tripleton, C.A. & Johnson, N.F. 1989. An introduction to the study of insects. Sixth edition. 875 pp. Saunders College Publ., Philadelphia.

Chapter in book

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