

RECORDS OF GALL MIDGES (DIPT.: CECIDOMYIIDAE) FROM THE ISLE OF MAN

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Abstract

Records of Cecidomyiidae (Diptera) known to occur in the Isle of Man are listed, with notes on biology, when known, and on geographic ranges. Six species are new additions to the British fauna: *Aprionus insignis* Mamaev, *Aphidoletes thompsoni* Möhn, *Coquillettomyia lobata* (Felt), *Mamevia vysineki* Skuhrová, *Mycodiplosis sphaerothecae* (Rübsaamen) and *M. pucciniae* (Rübsaamen).

Isle of Man Cecidomyiidae

The most recent checklist of the Diptera of the British Isles (Chandler, 1998) contains 620 species of Cecidomyiidae, indicating that, in number of species, this is the largest family of British Diptera. Despite this, the family has been little studied in the British Isles. This is especially true of the Isle of Man where few cecidomyiids have been recorded, other than some gall-inducing species (Allen, 1952; Garrad, 1976; O'Connor, 1996; O'Connor & O'Connor, 1999).

Since 1997 one of us (FDB) has collected cecidomyiids in the Isle of Man and has sent specimens to the other (KMH) for identification. As a result new records have been made, including six species not previously recorded in the British Isles. The following annotated checklist, which includes records from the publications listed above, summarises the information currently available, which could be substantially extended by further studies. Voucher specimens (microscope slides) for our records will be deposited in the Manx Museum, except those for the new British records (indicated by *), which will be deposited in the Natural History Museum, London [NHM].

Grid references for the main locations cited are: Laxey, Baldhoon Road and Glen Gardens, SC 42 84; Mountain Railway and Valley gardens, SC 43 84; Douglas, Harris Terrace, SC 37 76, Villa Marina, SC 38 76; Ramsey, Grove Museum, SC 44 95; Lezayre, Tea Rooms, SC 40 94.

LESTREMIINAE

This is the most primitive of the three subfamilies of Cecidomyiidae. Larvae feed on fungi in decaying organic matter, especially leaf litter, soil and decaying wood. Adults are often abundant and are easily caught in traps. Jaschhof (1998) published a thorough revision, based on adult morphology, of the 318 species known in the Holarctic Region and the identifications made here are based on his work, which should be consulted for additional information. All specimens were collected from yellow pan water traps and all identifications are based on examination of males. In most cases associated females could not be identified to species.

Anaretella defecta (Winnertz). A widespread Holarctic species. Laxey, Baldhoon Road, in water trap, 13-14.03.1999, [FDB 00-252], 1 male.

* *Aprionus insignis* Mamaev. First British record of this Holarctic species which was first described from Russia and later recorded from Sweden, Germany and Canada (Jaschhof, 1998). Laxey, Baldhoon Road, in water trap, 01-05.05.2000, [FDB 00-303], 1 male, M. Jaschhof det., to be deposited in the NHM.

Campylomyza flavipes Meigen. A widespread and locally abundant Holarctic species. Laxey, Baldhoon Road, in water trap, 10-11.01.1998, [FDB 00-248]; 15-16.03.1998, [FDB 00-250]; 28-29.08.1999, [FDB 00-254]; 21.02.2000, [FDB 00-300], 2 males; 26.02.2000, [FDB 00-301], 4 males; 27-29.03.2000, [FDB 00-302], 1 male; 1-5.05.2000, [FDB 00-303], 3 males; 15.05.2000, [FDB 00-305], 1 male.

Catocha latipes Haliday. A widespread and locally abundant Holarctic species. Laxey, Baldhoon Road, in water trap, 13-14.03.1999, [FDB 00-252], 1 male; 27-29.03.2000, [FDB 00-302], 1 male, 1 female.

Lestremia cinerea Macquart. A widespread and locally abundant cosmopolitan species, sometimes a pest of cultivated mushrooms. Laxey, Baldhoon Road, in water trap, 04-05.10.1997, [FDB 00-249], 1 male; 24-26.08.1998, [FDB 00-251], 1 male; 26.09.1999, [FDB 00-255], 1 male

PORRICONDYLINAE

This subfamily was represented by two adults in pan trap catches. Identification of the species was not attempted.

CECIDOMYIINAE

This is the most diverse and species rich of the three subfamilies. It contains species that are primarily phytophagous (including those that induce plant galls) as well as species that are mycophagous, and some that are zoophagous, preying on aphids and other small invertebrates. Due to lack of taxonomic study, the higher classification of the subfamily has not been clearly defined. For the purposes of this checklist species are listed under the two Supertribes that are currently recognised.

LASIOPTERIDI

Dasineura crataegi (Winnertz). This species is widespread in western Europe and occurs throughout most of the British Isles. The terminal rosette galls on young shoots are conspicuous and are often abundant in hedgerow re-growths after cutting. Laxey, 07.08.2000, larvae in shoot-tip gall of hawthorn, *Crataegus monogyna* Jacq., [FDB], 5 larvae.

Dasineura fraxini (Bremi). A widespread and locally common Palaearctic species. Galls develop on leaf mid-ribs (and occasionally on petioles) of ash (*Fraxinus excelsior*), as thickened pouches with slit-shaped openings above. Douglas, Manx Museum grounds, larvae in mid-rib galls on leaves of ash, 01.09.1999, 07.08.2000, 17.09.2000, [FDB], 19 larvae. Recorded earlier by O'Connor (1996).

Dasineura glechomae (Kieffer). Recorded by Garrad (1976). A common and widespread species throughout Europe inducing distinctive tubular ('lighthouse') galls on upper leaf surfaces of ground ivy, *Glechoma hederacea* L.

Dasineura pustulans (Rübsaamen). Recorded by O'Connor (1996) and O'Connor & O'Connor (1999). A common and widespread species throughout Europe inducing galls on leaves of meadowsweet, *Filipendula ulmaria*(L.) Maxim. Larvae live exposed in shallow depressions on the undersides of leaves briefly in early summer. After the larvae have fallen to the soil distinctive yellow to white leaf spots, about 5 mm across, remain through the summer and autumn.

Dasineura ulmaria (Bremi). Recorded by Allen (1952) and Garrad (1976). Also a widespread and common gall on *F. ulmaria* throughout Europe. Galls appear as rashes of small yellow to red swellings, 1-2 mm across, on upper leaf surfaces with corresponding conical projections on undersides.

Dasineura urticae (Perris). Larvae induce conspicuous galls of varied shape and size on leaves, flowers and stems of stinging nettle, *Urtica dioica* L. The species is widespread throughout Europe and often locally very abundant, especially in autumn. Laxey, Baldhoon Rd., 04.10.2001, adults emerged 28-30.10.2001, [FDB IOM-144], 3 males, 4 females. Recorded earlier by Allen (1952) and Garrad (1976).

Dasineura sp. on *Acer* flowers. This is probably an undescribed species that merits further study. Professor Edvard Sylén (in litt.) informed us that he had found an undescribed species of *Dasineura* in flowers of Norway maple, *Acer platanoides*, in Sweden but knew of no records from *A. pseudoplatanus*. Laxey, Glen Gardens, larvae in flowers of sycamore (*Acer pseudoplatanus*), 18-24.05.2000, [FDB]; 25-28.06.2001, [FDB IOM-0106], 3 larvae; 05.2002, [FDB], 4 larvae.

Jaapiella veronicae Vallot). Recorded by Allen (1952) and Garrad (1976). This is a very common and widespread species in Europe inducing conspicuous and remarkably uniform terminal hairy galls, about 5-10 mm across, on shoot tips of germander speedwell, *Veronica chamaedrys* L.

Rabdophaga strobilina Bremi. Recorded by Garrad (1976) [as *R. rosaria*]. This widespread Palaearctic species induces conspicuous terminal rosette galls on shoots of willows.

CECIDOMYIIDI

Aphidoletes aphidimyza (Rondani). This is a widespread and common cosmopolitan species, first described from Italy in 1847. Larvae are well-known specialised predators on aphids (with occasional records from whiteflies) and the species is used as a commercial biocontrol agent against aphid pests, especially on glasshouse crops but also on outdoor crops. Laxey, larvae preying on *Hyalopterus pruni* on plum, 30.08.2000, [FDB]. Laxey, Glen Garden, preying on *Myzus cerasi* on ornamental cherry, 11.06.2001, [FDB, IOM-0104]. Laxey, predator on

Periphyllus acericola (Walker) on sycamore, 12.10.2000, [FDB]. Laxey, Baldhoon Road, with aphids on plum, 26-30.09.2001, [FDB IOM-0128] Laxey, Baldhoon Road, preying on *Cryptomyzus ribis* on red currants, 19.08.2002, [FDB IOM-149]. Jurby Water Gardens, feeding on glasshouse whitefly, 18.08.2002, [FDB IOM-151], 2 larvae. Laxey River Gardens, with aphids on *Cotoneaster*, 27.09.2002, [FDB IOM-154], 3 larvae.

Aphidoletes urticaria (Kieffer). This is also a predator on aphids but generally less widespread and abundant than the preceding species. It may have a more northern distribution than *A. aphidimyza*. Laxey, Glen Gardens, larvae preying on *Myzus cerasi* on ornamental cherry, 15.06.2000, [FDB]; 11.06.2001, [FDB, IOM-0104]. Laxey, predator on *Periphyllus acericola* (Walker) on sycamore, 12.10.2000, [FDB]. Laxey, Baldhoon Road, with aphids on plum, 26-30.09.2001, [FDB IOM-0128] Laxey, Baldhoon Road, preying on *Cryptomyzus ribis* on red currants, 19.08.2002, [FDB IOM-149].

* *Aphidoletes thompsoni* Möhn. This is one of two European species that prey on adelgids. Möhn (1954) described larvae, males and females from Germany preying on two species of *Adelges* on a species of *Abies* and indicated morphological characters that distinguish this species from *A. abietis* (Kieffer), which also preys on species of *Adelges*. It has been suggested that the two species may be synonymous (Gagné, in prep.) but larvae collected in the Isle of Man agree well with Möhn's description, in which case this is the first British record of this species and the first record of the species from *Pineus pini* (Macquart). Adults have yet to be reared to confirm this identification. Laxey, Valley Gardens, larvae with *Pineus pini* on *Pinus sylvestris*, 10.07.2000, [FDB]; 07.06.2001, [FDB, IOM-0103]. Laxey River Gardens, with *Pineus pini* on pine, 22.06.2001, [FDB IOM-143], 3 larvae. Laxey Mountain Railway, from collection of *Pineus pini* on pine, 22.06.2001 [FDB IOM-0119]; 23.06.2001, [FDB, IOM-0112].

Clinodiplosis cilicrus (Kieffer). This is a very common Palaearctic species. Larvae are mycophagous and are often abundant in decaying plant tissues. Laxey, Baldhoon Road, from raspberry fruits infested by raspberry beetle, *Byturus tomentosus* (DeGeer), 01.09.1997, [FDB 00-239 / 00-240 / 00-244 / 00-245], 2 males, 2 larvae; on gooseberry leaf, 22.08.2001, [FDB IOM-0122], 2 larvae; larvae under scales of rotting onion in store, 30.12.2000, [FDB], 5 larvae.

Contarinia jacobaeae (Loew). Recorded by O'Connor (1996). Larvae live in flower buds of *Senecio jacobaea* L. which become slightly swollen and pear-shaped. Common and widespread in Europe.

Contarinia pyrivora (Riley). This is the pear midge which is sometimes a serious pest of cultivated pears, especially in gardens. Females lay eggs in pear blossom and the larvae feed in the young fruitlets, which fail to develop. Ramsey, from pear fruitlets, 04.06.2001, [FDB IOM-0105], 2 larvae.

Contarinia quercina (Rübsaamen). Larvae of this widespread Palaearctic species feed in buds and expanding shoots of various species of *Quercus*, sometimes causing appreciable distortion and stunting of young growths. Douglas, Villa Marina, larvae in distorted oak shoots, 31.05.2000, [FDB], 2 larvae.

Contarinia tiliarum (Kieffer). This is a common and widespread Palaearctic species that induces hard globular swellings on petioles, flower stalks and young stems of various species of *Tilia*. Peel Road, Douglas, 02.07.2001, [FDB IOM-0119]. Also recorded by O'Connor & O'Connor (1999).

* *Coquillettomyia lobata* (Felt). This is a Holarctic species, easily identified by the structure of the male genitalia. It was first described from Lake Clear, New York State, USA and has since been recorded in the Netherlands, Germany and the former USSR. Most records are of caught specimens and the biology of the species is unknown. This is the first published British record of the genus and species but the species has been taken in a light trap at Ripley, Surrey in recent years (Harris, unpublished). Laxey, Baldhoon Rd., in water trap, 17-18.07.2002, [FDB IOM-148], 1 male (cecid 200134) to be deposited in the NHM.

Lestodiplosis spp. Larvae of *Lestodiplosis* are predators on various small invertebrates, including larvae of other gall midges, beetle larvae, caterpillars, mites and even millipedes. The genus occurs worldwide and many species have been named. Thirty-seven names are included in the British checklist but some of these are likely to be synonyms as they were erected on the unproved assumption that each different plant or invertebrate host supports a distinct species of *Lestodiplosis*. It seems much more likely that many species are generalist and opportunistic predators, as indicated by recent observations in Wytham Wood, Oxford (Cole & Harris, 2002). The Isle of Man records are summarised below and specimens that may be of value in future revisionary taxonomic studies will be deposited in the Natural History Museum, London.

Lestodiplosis pini Barnes. The species of *Lestodiplosis* that was encountered most frequently occurred as larvae in colonies of the adelgid, *Pineus pini* (Gmelin) on Scots pine, *Pinus sylvestris* L. These larvae may have been feeding directly on the adelgids but could also have been preying on *Aphidoletes thompsoni* larvae, which are specialised predators on adelgids (see above). The species is tentatively identified as *Lestodiplosis pini* Barnes, which was originally described (Barnes, 1928) on adults reared from larvae found in aphid colonies living on the bark of Weymouth pine, *Pinus strobus* L. in Delamere Forest, Cheshire, during August and September, 1925. *Aphidoletes* larvae were also present and Barnes considered it most likely that they were the prey of *L. pini* rather than the aphids, as there were at that time no authenticated cases of *Lestodiplosis* larvae feeding on aphids. Future revisionary studies will probably show that *L. pini* is a junior synonym of one of the many other *Lestodiplosis* species described from western Europe. Laxey, Valley Gardens, 10.07.2000, 1 larva; 06.08.2000, 2 male, 1 female; 01-05.09.2000, 1 larva, 1 female pupa; 22.06.2001 [FDB IOM-143], 1 female;

28.06.2002, adults emerged 10-20.07.2002, [FDB IOM-140], 3 males, 2 females; 12.07.2002, emerged 21.07.2002 [FDB IOM-139], 1 female, emerged 29.07.2002 [FDB IOM-141], 1 male. Laxey, Mountain Railway, 23.06.2001, adults emerged 26.06-05.07.2001, [FDB IOM-112], 2 males, 4 females; 27.07.2001, [FDB IOM-0120], pupal exuvium. All from colonies of *Pineus pini* on *Pinus sylvestris*. Laxey, Mountain Railway, from *Pineus pini* colony on *Pinus nigra* var. *maritima*, 22.07.2002, adult emerged 06.08.2002, [FDB IOM-152], 1 female.

Lestodiplosis urticae Nijveldt. Larvae of this species prey on larvae of *Dasineura urticae* (Perris), which is a widespread and common species inducing galls on stinging nettles, *Urtica dioica*, (see above). As with the previous species of *Lestodiplosis*, it may be synonymous with an earlier described species. One larva was observed feeding on a larva of *D. urticae*, which confirms this association. Laxey, Baldhoon Rd., feeding on *Dasineura urticae* larva, 03.09.2001, [FDB IOM-0124], 1 larva, plus prey larva; on nettle foliage, [FDB IOM-0126], 1 larva; 26.08.2001, [FDB IOM-0125], 2 larvae; on nettle leaf, 18.08.2001, [FDB IOM-0121], 2 pupae.

Lestodiplosis spp. (*raphani* gp.). Laxey, Baldhoon Rd., yellow pan water trap, 10-11.01.1998, [FDB 00-248], one male. This is an unusually early date for an adult *Lestodiplosis*. So far as is known, most species overwinter as larvae and adults emerge in the following spring. Laxey, Baldhoon Rd., caught on laboratory bench, 02.07.2002, [FDB IOM-142], one female. This is probably sp. A (*raphani* gp.) recorded by Cole & Harris (2002) from oak in Wytham Wood, Oxford. Douglas, Harris Terrace, on *Tilia* leaf, 27.06.2001, [FDB IOM-0115], one larva.

A number of other specimens of *Lestodiplosis* were collected, mostly belonging to the *Lestodiplosis trifolii* species group, and have been retained for further study. These include: Douglas, from cocoons on twigs of sycamore, *Acer pseudoplatanus* L., 31.03.1999, [FDB 00-242], 3 females; under bark of dead rowan, *Sorbus aucuparia* L., with aphid mummies, 31.05.2000, [FDB], one larva; preying on caterpillar of *Caloptilia syringella* (Fabricius) in leaf mine on ash, *Fraxinus excelsior* L., 13.09.2000, [FDB], one larva. Ramsey, from colony of *Eulecanium tiliae* on elm, 4.03.2001, [FDB IOM-0101], 1 female; with *Eulecanium* and *Pulvinaria* on *Ribes*, 24.05.2002, adult emerged 04.06.2002, [FDB IOM-146], 1 female; Grove Museum, with *Aulacaspis rosae* on rose, 21.04.2001, [FDB IOM-145], 1 male. Lezayre, from colony of *Chionaspis salicis* on willow, 11.03.2001, adult emerged 23.03.2001, [FDB IOM 0102], 1 male. Laxey, larva on hawthorn leaf, 12.06.2001, [FDB IOM-0113], 1 female.

* *Mamaevia vysineki* Skuhravá. This is a new British record of a European species first described from Czechoslovakia and later recorded from Poland, Germany and the USSR (Skuhravá, 1986). All records are of caught specimens and the biology of the species is unknown. Laxey, Baldhoon Road, in water trap, 16-17.05.1999, [FDB 00-253], male 20048, to be deposited in the NHM.

- * *Mycodiplosis sphaerothecae* (Rübsaamen). This mycophagous species has been recorded on many occasions on powdery mildews (*Sphaerotheca*, *Erysiphe*, *Microsphaera* etc.) in Germany (Holz, 1970) and has also been recorded from the Netherlands. It is probably widespread and abundant throughout the British Isles but this is the first published record. Laxey, Baldhoon Road, larvae with mildew on black currant leaves, 05.07.2000, and 19.08.2002, [FDB IOM-150]. Slide no. 20123 (3 larvae) to be deposited in the NHM.
- * *Mycodiplosis pucciniae* (Rübsaamen). This is a second mycophagous species for which there is no previous published record in the British Isles. In Germany it has been recorded frequently on rust fungi (*Melampsora* and *Puccinia*) (Holz, 1970) and it has also been recorded from Latvia and Russia. Groudle Glen, larvae on *Alnus* leaves infected by fungus, 29.09.2002, [FDB IOM-155]. Slide 20122 (4 larvae) to be deposited in NHM.

Adults of one or more additional species of *Mycodiplosis* were caught at Laxey in a yellow pan water trap on two occasions, 9-10.09.1997, [FDB 00-247]; 28-29.08.1999, [FDB 00-254] but the species have not been identified.

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