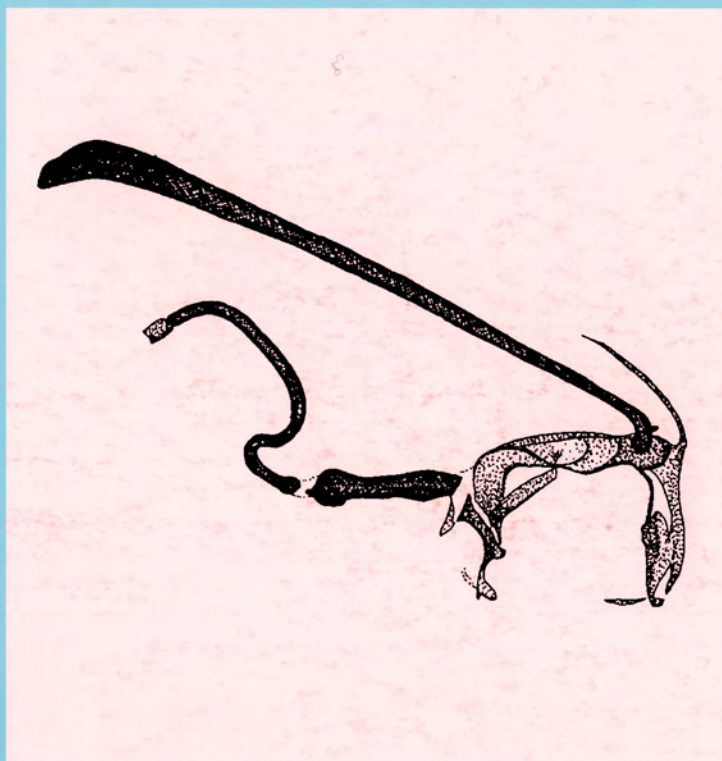


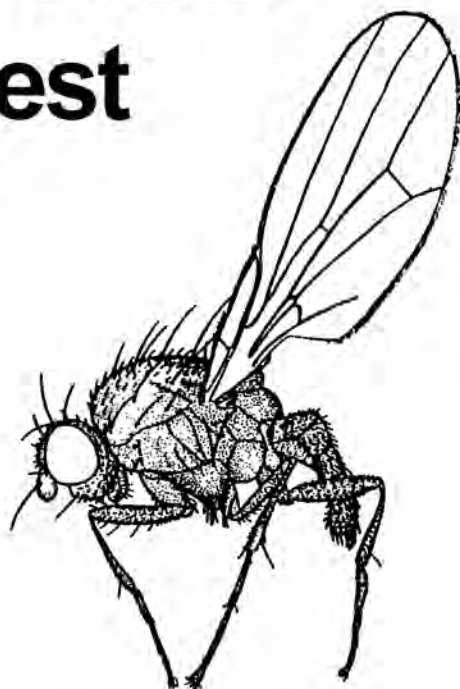
# Dipterists Digest



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# Dipterists Digest

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## ***Cheilosia psilophthalma* Becker, 1894 (Diptera, Syrphidae) confirmed as present in Britain**

STEVEN FALK

Warwickshire Museum, Market Place, Warwick CV34 4SA

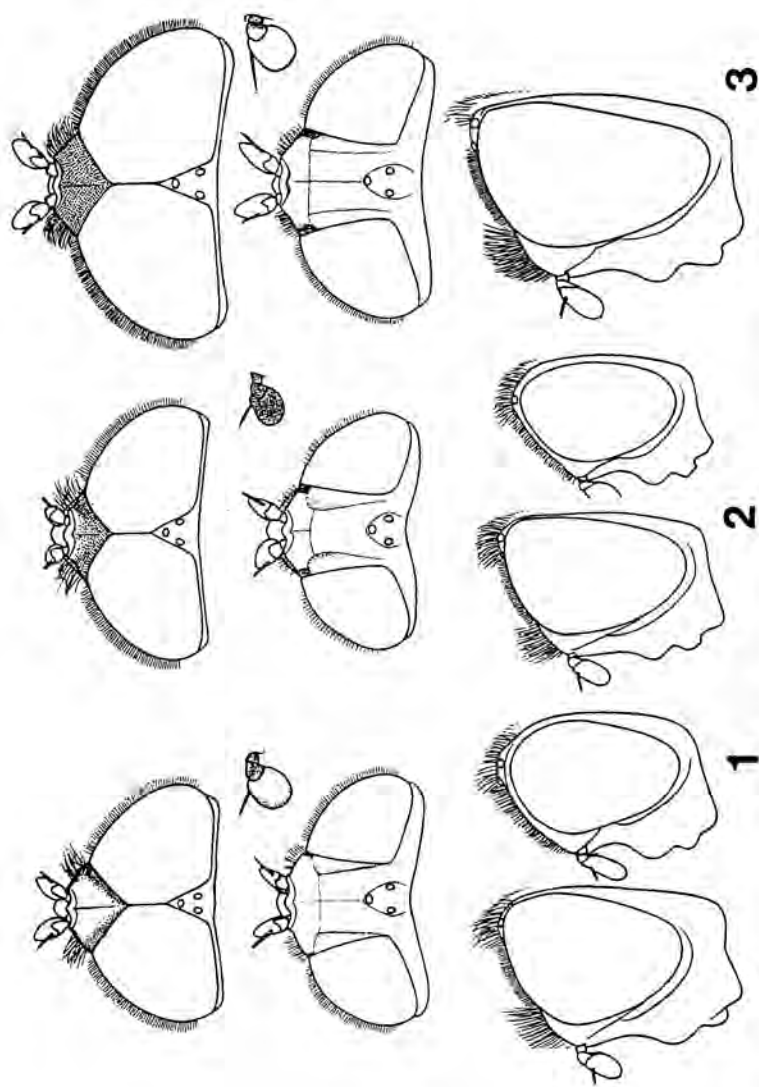
### **Summary**

*Cheilosia psilophthalma* Becker, 1894 can be confirmed as present in Britain from Warwickshire, Berkshire and Suffolk. Its separation from the similar *C. urbana* (Meigen, 1822) and *C. uviformis* Becker, 1894 is discussed and current investigation into its bio-control potential as a control agent of Mouse-ear Hawkweed *Pilosella officinarum* in New Zealand is flagged.

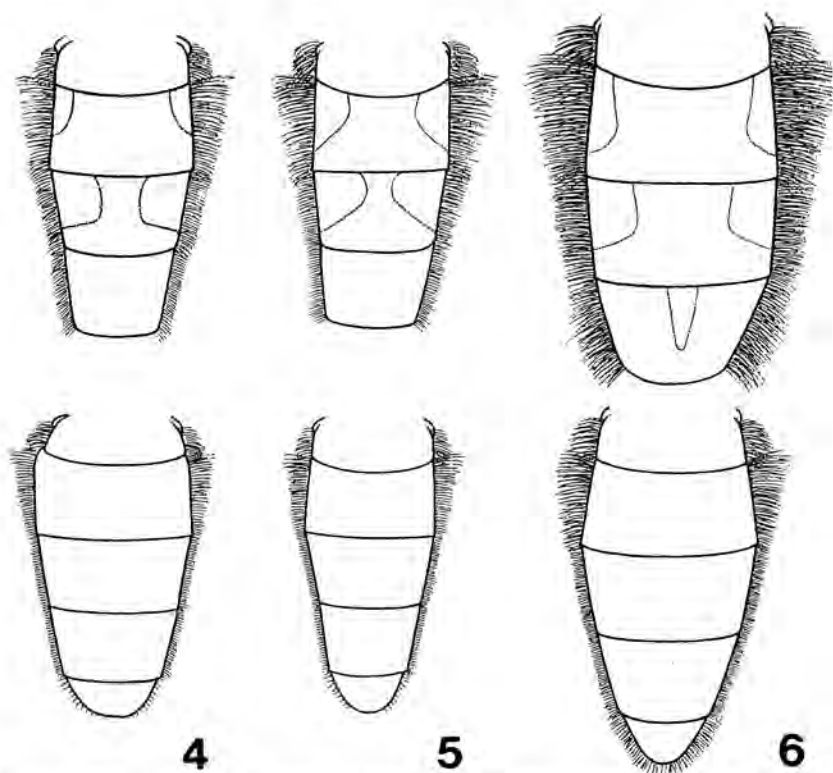
Speight (1996) added this species to the British Isles fauna from Ireland, highlighting its close resemblance to *C. urbana* (Meigen, 1822) (formerly known as *praecox* (Zetterstedt, 1843)) and *mutabilis* (Fallen, 1817). During a survey of an abandoned limestone quarry in central Warwickshire during early May 2001, one male and two females were identified from within a series of *C. urbana* obtained on and around blossoming blackthorn *Prunus spinosa*, willow *Salix* and apple *Malus* within calcareous grassland and scrub. The slightly broader build of the *psilophthalma* specimens, particularly the broader frons of the females, was the initial feature that drew attention. Further examination revealed the entirely black tarsal claws, a larger, paler third antennal segment, and the rather different male genitalia associated with *psilophthalma*.

Examination of my personal collection, which contains 'praecox' material from most of the sites where I have encountered it, revealed 5 further specimens from two more Warwickshire sites, a single site in Berkshire and a single site in Suffolk and it has turned up at two further Warwickshire sites during 2002. It transpires that I have much more material for *urbana* than *psilophthalma*, though the data for *psilophthalma* still suggests that it may be widespread in southern Britain at least. All British 'praecox' material will now need to be checked for assignment either to *urbana*, *psilophthalma* or possibly *uviformis* Becker, 1894. The latter species, added to the British Isles list by Speight (1986) as *argentifrons* Hellén, resembles a large *urbana* or *psilophthalma* (especially in the female) and is now known from sites in Ireland, Yorkshire, Derbyshire and Cambridgeshire (the last record representing Species A of Stubbs and Falk 1983). *C. mutabilis* is sufficiently distinct from all of these species due to its much darker legs (the hind tibiae at most dull brownish at the base as opposed to extensively orange with at most a black band occupying half the length of the tibia) and extensively black-haired tergites (both sexes) and mesonotum (male), though it appears to belong to this general species group.

A search of the internet in early 2002 revealed that *psilophthalma* is far from an obscure species now. Together with *urbana* and the cecidomyiid *Macrolabis pilosellae* (Binnie), it is being released in New Zealand in an attempt to control *Pilosella officinarum* and several *Hieracium* species, which are serious introduced weeds of hill and high country pastoral areas as well as conservation land (ERMA and University of Otago web sites, 14.2.02). Grosskopf *et al.* (2001) have revealed that the larvae of *psilophthalma*, the hawkweed 'Crown-feeding Hoverfly', feed on the above-ground parts of *Pilosella* (supported by observations of Stuke *pers. comm.*), whilst the larvae of *urbana*, the hawkweed 'Root-feeding Hoverfly' attack the roots. Females of both species lay their eggs in the leaf axils, but upon eclosion the larvae of the two species move to different parts of the plant. Pupation of both species takes place in September and October, and they have been reared on several *Hieracium* species under test conditions. It is also stated that *C. mutabilis* attacks *Pilosella*.



Figs 1-3. Heads of *Cheilosia* species. 1, *C. psilophthalma* Becker; 2, *C. urbana* (Meigen); 3, *C. uviformis* Becker. Each comprising dorsal views of male and female head, lateral view of female antenna and lateral views of male (left) and female (right) head (male only for *C. uviformis*).



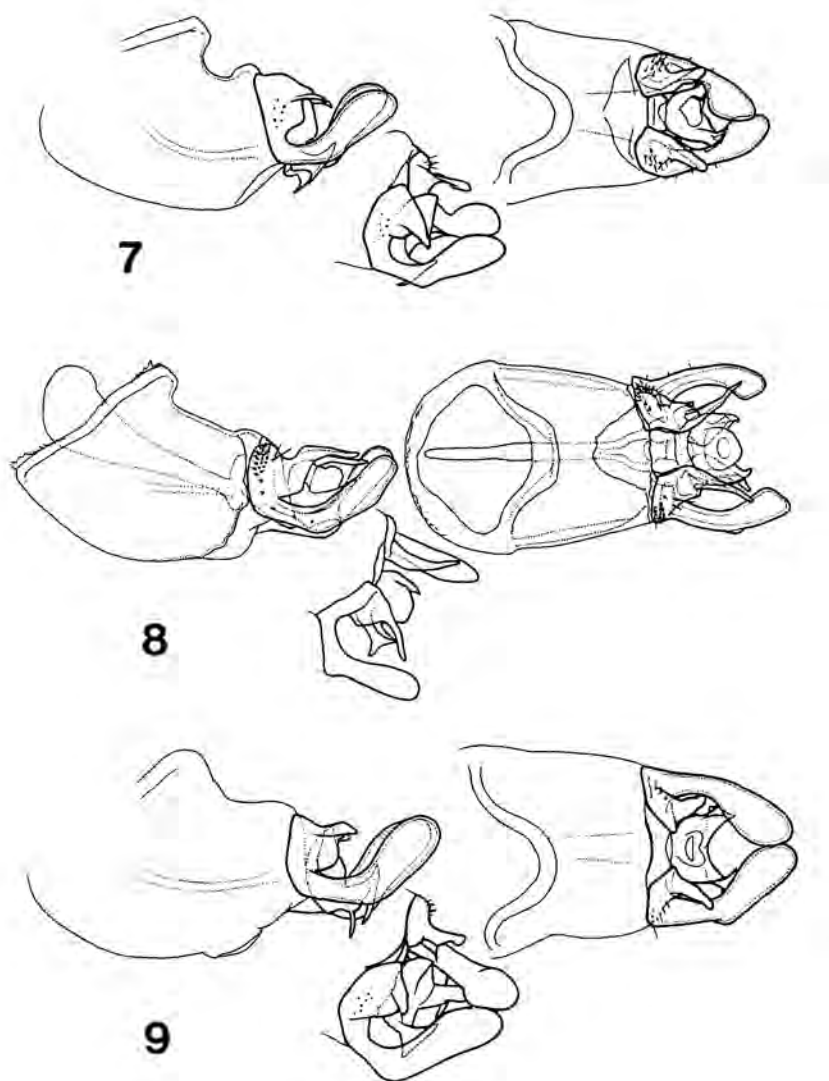
**Figs 4-6. Dorsal view of abdomen of *Cheilosia* species, male above, female below. 4, *C. psilophthalma* Becker; 5, *C. urbana* (Meigen); 6, *C. uviformis* Becker.**

At the Warwickshire and Suffolk sites, *Pilosella* clearly seems to be the food-plant and the distinctive pre-flowering rosettes of this plant are a regular feature. Females were seen resting on such rosettes at Bishops Bowl, together with females of *urbana*. The species is probably not confined to calcareous sites, though in Warwickshire the best *Pilosella* sites tend to occur in limestone quarries with clay slopes and spoil-heaps. Speight ('Syrph the Web' web-site) gives further information on its habitat, habits and determination at a European level.

I have material of genuine *urbana* from about a dozen sites in Warwickshire, also sites in Berkshire, Middlesex, Suffolk, Norfolk and Yorkshire. Roy Crossley has kindly provided me with 4♂ and 1♀ *uviformis* from the Yorkshire's Lower Derwent, obtained in 1994 and 1997.

### Identification

A new full key to *Cheilosia*, incorporating *psilophthalma* and *uviformis* will be found in Stubbs and Falk (2002), the recently published revision of British Hoverflies (Stubbs and Falk 1983), but the opportunity is taken here to clarify the separation of *psilophthalma* from *urbana* and *uviformis*, the British species that it most closely resembles.



Figs 7-9. Male genitalia of *Cheilosia* species, lateral view on left with oblique view of surstyli below, dorsal view on right. 7, *C. psilophthalma* Becker; 8, *C. urbana* (Meigen); 9, *C. uviformis* Becker.



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- |    |         |   |
|----|---------|---|
| 1. | Males   | 2 |
| -  | Females | 4 |

2. Frons entirely dulled by heavy grey dusting and more densely haired (Fig. 3). Upper face, zygomas (= eye margin zones) and lower occiput also heavily dusted. Tergite 4 with a stripe of black dusting along much of axis (view from front). Tarsal claws pale at base. Tibiae yellow, sometimes with an ill-defined smudge half way along posterior face of fore and mid tibiae and anterior face of the hind ones. Scutellar marginal bristles weak and not clearly differentiated in all specimens. Body hairs longer throughout, the lateral hairs of tergite 4 about twice as long as apical width of hind tibia, the hind femur with many anteroventral hairs about twice as long as femoral width. Sternites 2-4 dulled by rather heavy grey-dusting. Posterior anepisternum distinctly dusted. A larger species (wing length typically 8mm). Abdomen Fig. 6, genitalia Fig. 9.

♂ *uviformis* Becker

- Frons only heavily dusted along eye margins, leaving central part shining black and at most only lightly dusted, the hairs sparser (Figs 1-2). Upper face, zygomas and lower occiput less heavily dusted. Smaller species (wing length up to 7mm). Tergite 4 without a stripe of black dusting along axis. Hind tibia with obvious black ring, rings of fore and mid tibiae sometimes reduced to black spots on posterior faces. Body hairs shorter, the lateral hairs of tergite 4 up to 1.5 times as long as apical width of hind tibia, the hind femur with longest hairs about as long as the femoral width. Sternites 2-4 shining with light or scarcely detectable dusting.

3

3. Tarsal claws obviously pale at base. Frons small and not inflated, the dusting at the sides as heavy as that at the top of the zygomas and thin dusting spreading into the middle of the frons (rotate specimen to get best view) (Fig. 2). Third antennal segment usually mainly dark (occasionally extensively reddish). Tergite 3 with shining anterolateral spots usually separated by much less than their own width and often fused (occasionally as in *psilophthalma*). Four front tibiae with black bands narrower and often incomplete. Posterior anepisternum lightly dusted. Scutellar marginals usually clearly differentiated. Sternites 2-4 with scarcely detectable dusting. Abdomen Fig. 5, genitalia (Fig 8) with dorsal process of superior lobe long and narrow.

♂ *urbana* (Meigen)

- Tarsal claws entirely black or obscurely paler at base. Frons larger and more inflated than *urbana*, the dusting here less dense than that at the top of the zygomae and scarcely detectable in the middle of the frons (Fig. 1). Third antennal segment extensively reddish. Tergite 3 with shining anterolateral spots separated by approximately their own width. Four front tibiae with black bands broader and complete. Posterior anepisternum scarcely dusted. Scutellar marginals undifferentiated in two males seen (weak ones can be present, Speight *pers. comm.*). Sternites 2-4 slightly more heavily dusted than *urbana*, but less so than *uniformis* and still distinctly shining (description based on only 2 specimens). Abdomen Fig. 4, genitalia (Fig 7) with dorsal process of superior lobe short.  
♂ *psilophthalma* Becker
- 4. Tarsal claws entirely black or obscurely pale at base. Frons broader, particularly at front (ratio to head width 3:7), scarcely dusted at front corners (the dusting at the top of the zygomae usually ending abruptly at the bottom of the lunule) and with a median groove reaching back to the front ocellus (Fig. 1). Third antennal segment large (about twice as wide as apical width of front tibia), rounded and mainly reddish. Posterior anepisternum scarcely dusted and obviously shining. Scutellar marginals 0.5-0.75 times as long as length of scutellum. Front tibia with a strongly-developed black spot on posterior face, mid tibia and anterior face of hind tibia also with this but developed to a lesser extent. Femora more narrowly pale at tips. Tergites relatively broad, T2 and T3 about 1.75 times as wide as long, T5 about 1.5 times as wide (Fig. 4). Sternites scarcely dusted and shining. Wing length 5.5-6mm.  
♀ *psilophthalma* Becker
- Tarsal claws obviously pale at base. Frons narrower (ratio to head width 2:5) and more conspicuously dusted at front corners (the dusting at the top of the zygomae continuing alongside the lunule) (Figs 2-3). Tibiae at most with ill-defined dark smudges, and front four often entirely pale. Femora more broadly pale at tips. Posterior anepisternum more obviously dusted.  
5
- 5. Third antennal segment relatively small and clearly longer than wide, about 1.5 times as wide as apical width of fore tibia, and usually dark (occasionally mainly reddish) (Fig. 2). Frons with the median groove usually only present in the front third (occasionally weakly developed in front of ocellar triangle) (Fig. 3). Posterior anepisternum lightly dusted. Scutellar marginal setae variable in length and strength, sometimes very weak. Tergites relatively narrow, T3 and T4 about 1.5 times as wide as long, T5 about 1.25 times as wide (Fig. 5). Sternites scarcely dusted and shining. Wing length as in *psilophthalma*.  
♀ *urbana* (Meigen)
- Third antennal segment broader as in *psilophthalma* and mainly reddish (Fig. 3). Frons with a median groove stretching back to the front ocellus (Fig. 3). Upper face, zygomae and lower occiput more heavily dusted than previous two species. Posterior anepisternum distinctly dusted. Scutellar marginal setae about as long as length of scutellum. Abdomen with tergites as in Fig. 6. Sternites 2-4 shining centrally but more obviously dusted at sides. A larger species (wing length 7mm) with noticeably longer body hairs than previous two, especially on frons, pleura and femora.  
♀ *uniformis* Becker

In continental Europe, *C. vijici* Claussen & Doczkal, 1998 and *C. latigenis* Claussen & Kassebeer, 1993 are said to be very similar (see Claussen and Kassebeer 1993, Claussen and

Doczkal 1998). Claussen and Doczkal's key states that female *psilophthalma* have narrower hind basitarsi than *urbana*, though this is not a reliable feature of the material I have to hand. The female of *C. clama* Claussen & Vujic, 1995 apparently closely resembles female *psilophthalma*, but has bare eyes (Speight *pers. comm.*). Care should also be taken with specimens of *C. pagana* (Meigen, 1822) with slightly hairy eyes (a frequent phenomenon in the spring brood), though the male genitalia are very different to the species considered and the female third antennal segment is much larger. The known range of *psilophthalma* outside of Britain currently includes southern Norway, Ireland, France, Poland, Switzerland, Greece, Montenegro, Serbia and Russia (Speight, 'Syrph the Web')

### Acknowledgements

I wish to thank Roy Crossley for providing material of *C. uviformis* from Yorkshire. Alan Stubbs, Jens-Hermann Stuke and Martin Speight gave valuable assistance during the preparation of this paper.

### References

- Claussen, C. and Doczkal, D. 1998. Eine neue Art der Gattung *Cheilosia* Meigen, 1822 (Diptera: Syrphidae) aus den Zentralalpen. *Volucella* **3**, 1-13.
- Claussen, C. and Kassebeer, C.K. 1993. Eine neue Art der Gattung *Cheilosia* Meigen, 1822 aus den Pyrenäen (Diptera: Syrphidae). *Entomologische Zeitschrift*, Frankfurt am Main **103**, 420-427.
- Grosskopf, G., Smith, L.A. and Syrett, P. 2001. Host range of *Cheilosia urbana* (Meigen) and *Cheilosia psilophthalma* (Becker) (Diptera: Syrphidae), candidates for the biological control of invasive alien hawkweeds (*Hieracium* species, Asteraceae) in New Zealand. *Biological Control* **24**, 7-19.
- Speight, M.C.D. 1986. *Cheilosia argentifrons* (Diptera: Syrphidae) new to Ireland: *Donacia cinerea* (Coleoptera: Chrysomelidae) and *Palloptra muliebris* (Diptera: Pallopteridae), presence confirmed in Ireland. *Irish Naturalists Journal* **22**, 159-160.
- Speight, M.C.D. 1996. *Cheilosia psilophthalma* and *Odinia boletina*: insects new to Ireland and *Sapromyza sexpunctata* confirmed as an Irish species (Diptera: Syrphidae, Odiniidae & Lauxaniidae). *Irish Naturalists Journal* **25**, 178-182.
- Speight, M.C.D. and Claussen, C. 1987. Redefinition of *Cheilosia ahenea* and *C. argentifrons* with records extending the known range of these species in Western Europe (Diptera, Syrphidae). *Annales de la Société entomologique de France (Nouvelle Série)* **23**, 299-308.
- Stubbs, A.E. 1998. *Cheilosia psilophthalma* added to the Irish list. Could it occur in Britain? *Hoverfly Newsletter* **25**, 8-9.
- Stubbs, A.E. 2000. *British Hoverflies - an illustrated identification guide*. British Entomological and Natural History Society, Reading. Update on the British List (supplement).
- Stubbs, A.E. and Falk, S.J. 2002. *British Hoverflies - an illustrated identification guide*. (Revised and updated by Ball, S.G., Stubbs, A.E., McLean, I.F.G. Morris, R.K.A. Falk, S.J. and Hawkins, R.H.) 469 pages. British Entomological and Natural History Society, Reading.
- Stuke, J.H. and Claussen, C. 2000. *Cheilosia canicularis* auctt. – ein Artenkomplex. *Volucella* **5**, 79-94.

**A second British record of *Delia lavata* (Boheman, 1863) (Diptera, Anthomyiidae)** – On 19 June 2001 one of the authors of this note (PR) was surveying the

Diptera of Rye Golf Course at Camber, East Sussex and, at TQ948184, caught a large, pale grey dusted anthomyid fly in the sparsely vegetated area immediately behind the first line of sand dunes above the beach. The specimen was passed to DMA for determination and proved to be a female of *Delia lavata* (Boheman, 1863), the second British record of this species. It is now housed in the Hope Collections in the Oxford University Museum of Natural History.

With a wing length of nearly 6mm, the female can be recognised by the following characters: head, thorax and abdomen mainly dark in ground colour but densely dusted light greyish; frontal stripe orange; scutum and abdomen without vittae; legs orange-yellow except for grey dusted fore femora and black tarsi. Head with wide parafacials and genae, both somewhat wider than width of first flagellomere, the latter not reaching mouth margin. Arista long pubescent, total width of hairing about two thirds width of first flagellomere. Prealar seta entirely absent; one pair of presutural acrostichal setae which are close together; katapisternals 1 + 2, lower posterior seta about three quarters length of upper. Wing with a pair of strong costal spines, which are as long as crossvein r-m. Legs: hind femur without pv setae; fore tibia with 3 strong submedian setae (a, ad and pv); mid tibia with a small av seta at apical third, a much stronger ad seta slightly more basal. 2 pd and 2 pv setae; hind tibia with 2 av, 3-4 ad and 3-4 pd setae. The cerci and tergite 9 are armed with several strong upcurved spines, no doubt an adaptation to digging in sand.

The male, which has not yet been caught in Britain, agrees with the above characters, except for the usual sexual differences, i.e. eyes nearly touching, t1 with only one submedian seta but with a strong blunt ended pv apical spur; t2 without av or ad setae. Fifth sternite of male with long processes (thrice as long as basal part of sternite), each bearing 14-18 blunt ended setae on whole length; the apices of the processes with a small inner swelling and a number of fine inwardly directed bent hairs.

The only other British *Delia* species with numerous spatulate setae on the whole length of the processes on the male fifth sternite, and apical spines on the female ovipositor is *Delia pallipennis* (Zetterstedt). The two species are closely related and both are found in sandy places. *D. pallipennis* is darker grey dusted with mainly darker legs. It should be noted, however, that there are several other species of Anthomyiidae in which the females have spinose cerci, including species of *Leucophora*; this adaptation has obviously evolved independently in different groups of species, which are not otherwise closely related.

*D. lavata* was first recorded as British in the recent checklist (Chandler, P.J. 1998, (Ed.) Checklists of Insects of the British Isles (New Series). Part 1: Diptera (Incorporating a List of Irish Diptera). *Handbooks for the Identification of British Insects* 12(1), i-xix, 1-234. Royal Entomological Society, London). This was based on a female found in the Natural History Museum, London by Mr. N. Wyatt, and identified by him as *D. lavata*. It was collected in the same area, and labelled E. Kent: Camber, sand dunes, 2.viii.1935, O.W. Richards. Since both the sand dunes and Camber village end some 4 kilometres west of the East Sussex/Kent boundary, it is assumed this location was in East Sussex close to the 2001 record. Until further specimens are found, it cannot be ruled out that these two females may have been blown over from the French coast.

The species is widely distributed on the coasts of Western Europe from Sweden to France. It has also been recorded from China (Tibet) and occurs in Mongolia (unpublished record). Nothing is known about the life history – **PATRICK ROPER**, South View, Churchland Lane, Sedlescombe, East Sussex TN33 0PF and **D.M. ACKLAND**, Hope Entomological Collections, University Museum of Natural History, Parks Road, Oxford OX1 3PW

## **A provisional checklist of the hoverflies (Diptera, Syrphidae) of the islands of North Uist, South Uist, Benbecula, Eriskay and Berneray in the Outer Hebrides**

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### **Summary**

A provisional checklist is provided of the Syrphidae recorded from the islands of North and South Uist, Benbecula, Eriskay and Berneray in the Outer Hebrides. The composition of the fauna is assessed in relation to the specific habitat requirements of each species.

### **Introduction**

This paper presents in the form of an annotated table (Table 1) a provisional checklist of the hoverflies (Diptera, Syrphidae) recorded from the islands of North and South Uist, Benbecula, Eriskay and Berneray (which lies to the north of North Uist and to which it has been connected by a causeway since 2000)<sup>1</sup> in the Outer Hebrides, Scotland. As far as we are aware, the current paper provides the first published records of hoverflies for Berneray. The checklist is based on unpublished records made by MJP in July 1997, July 1999 and August 2002, by AWD in May 1998 and by AMcC and AWD in July 2000 and 2001, in addition to the published records made in June and July by Whiteley *et al.* (1994), in July 1999 by McCullough and Wakeham-Dawson (2001), August 1989 by Skidmore (1994) and records made by Waterston (1981) and MacGowan (1994) (time of year not stated). Additional information for the checklist was found in Ball and Morris (2000). To date, little information is available on the relative frequency of the observed species and the current list of hoverfly species recorded from these islands is probably far from complete. In particular, there appear to be no records from early spring and late autumn. This provisional checklist is intended as a basis for further study. The nomenclature is based on Chandler (1998), and we follow this and Ball and Morris (2000) in adopting an alphabetical order of species.

The Outer Hebrides comprises a 200km long chain of islands, situated off the west coast of Scotland (approximately 57°50' N, 07°00' W). North and South Uist, Benbecula, Eriskay and Berneray are among the islands in this chain. They are largely flat and treeless, and are exposed to strong winds from the Atlantic Ocean. Blanket peat bog covers the lowland areas and about 50% of the islands' surface is covered with water in lochs of varying sizes. The western sides of the islands have areas of machair (flower-rich plains of shell-sand that has been washed over the islands' rock basement), which are used primarily for low intensity grazing, hay production and arable crop production. The machair supports, in association with the sand dunes, peat bogs and lochs, a diversity of plants (Pankhurst and Mullin 1991). However, despite the ameliorating effects of the Gulf Stream there is a relatively limited insect fauna, which may be the result of the location of the islands and the wet and windy weather generated by the Atlantic to the west.

<sup>1</sup> This island of Berneray is not to be confused with the island of the same name that is situated to the south of Barra below South Uist.

The grid references listed below indicate the 1km square in which the locations in Table 1 are to be found. They do not indicate the precise point to which any particular record relates.

| North Uist                         |        | South Uist and Eriskay            |        |
|------------------------------------|--------|-----------------------------------|--------|
| Baleshare                          | NF7565 | Allt volgair                      | NF7928 |
| Balranald                          | NF7169 | Arinambane area,<br>Locheynort    | NF7928 |
| Ben Mhor                           | NF8976 | Beinn Mhor                        | NF8031 |
| Cladach Kirkiboist<br>(Chireboist) | NF7865 | coast near Gearraidh<br>na Monadh | NF7316 |
| Loch na Morgha                     | NF8674 | Howmore                           | NF7536 |
| Newton                             | NF8877 | Loch Druidibeg<br>Island          | NF7838 |
| Solas                              | NF8174 | Loch Kildonan                     | NF7327 |
| Weaver's Point                     | NF9571 | Pollachar Marsh                   | NF7414 |
| <b>Benbecula</b>                   |        | Rubha na Meine                    | NF7828 |
| Eilean na cille                    | NF8446 | Coilleag, Eriskay                 | NF7810 |
| Oban uaine                         | NF8447 | Na Pairceanan,<br>Eriskay         | NF7909 |

#### Acknowledgements

AMcC and AWD thank Edward and Katherine Wake for inviting them to stay at Newton House, North Uist. Susie Gibbs, Sarah Barclay and others assisted with this study. We are grateful to Peter Chandler for improvements to an earlier version of this paper.

#### References

- Ball S.G. and Morris R.K.A. 2000. *Provisional Atlas of British Hoverflies (Diptera, Syrphidae)*. Huntingdon: Biological Records Centre.
- Chandler, P.J. 1998. (Ed.) Checklists of Insects of the British Isles (New Series). Part 1: Diptera (Incorporating a List of Irish Diptera). *Handbooks for the Identification of British Insects* **12(1)**, i-xix, 1-234. Royal Entomological Society, London.
- McCullough, A. and Wakeham-Dawson, A. 2001. Hoverfly (Syrphidae) records from North Uist and the Monach Islands, Scotland – July 1999. *British Journal of Entomology and Natural History* **13**, 196.
- MacGowan, I. 1994. Additions to the list of Diptera from the Western Isles. *Dipterists Digest (First Series)* **14**, 28-31.
- Pankhurst, R. J. and Mullin, J. M. 1991. *Flora of the Outer Hebrides*. London: HMSO.
- Skidmore, P. 1994. Composite List of Diptera collected in South Uist, Benbecula and North Uist in August 1989. *Dipterists Digest (First Series)* **14**, 44-52.
- Waterston, A.R. 1981. The non-marine invertebrate fauna of the Western Isles. *Proceedings of the Royal Society of Edinburgh* **79B**, 215-321.
- Whiteley, D., Garland, S.P. and Hancock, E.G. 1994. A Survey of Diptera on South Uist and adjacent Outer Hebridean Islands. *Dipterists Digest (First Series)* **14**, 32-43.

**Table 1. Provisional checklist of hoverflies from the islands of North and South Uist, Benbecula, Eriskay and Berneray. Source of records:** A, Ball and Morris (2000); M, MacGowan (1994); MP1, MJP previously unpublished records (7-9 July 1997); MP2, MJP previously unpublished records (17-24 July 1999); MP3, MJP previously unpublished records (4-8 August 2002); MWDD1, McCullough and Wakeham-Dawson (2001); MWDD2, AMcC and AWD previously unpublished records (29 July - 4 August 2000); MWDD3, AMcC and AWD previously unpublished records (22-27 July 2001); S, Skidmore (1994); W, Whiteley *et al.* (1994); WA, Waterston (1981).

|                                                | Berneray      | North Uist                                                                                 | Benbecula                                 | South Uist (inc. Eriskay)                                                       | Notes on habitat and frequency (based, unless otherwise stated, on observations made mainly on North Uist by AMcC and AWD)                                      |
|------------------------------------------------|---------------|--------------------------------------------------------------------------------------------|-------------------------------------------|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Anasimyia lineata</i> (Fabricius, 1787)     |               | A, W (Baleshare lochside)                                                                  |                                           | MP1 (Pollachar Marsh), A, W                                                     |                                                                                                                                                                 |
| <i>Anasimyia humilis</i> (Meigen, 1822)        |               | A, W (Baleshare lochside)                                                                  |                                           | MP2 (Pollachar Marsh), A, W, WA                                                 |                                                                                                                                                                 |
| <i>Cheilosia bergenstammi</i> Becker, 1894     |               | MWDD2, MWDD3 (Newton, Cladach Chireboist), MP3 (Loch na Morgha). Also at Newton 25.7.1999. |                                           | MP1, MP2 (both Pollachar Marsh), MP3 (Howmore, Eriskay), A, W (Howmore machair) | In machair on raywort ( <i>Senecio jacobaea</i> ), yarrow ( <i>Achillea millefolium</i> ) and <i>Phragmites</i> stands adjacent to rough grassland. Infrequent. |
| <i>Cheilosia illustrata</i> (Harris, 1786)     | MP3 8.8.02    | MWDD1, MWDD2, MWDD3 (Balfarnald, Solas, Newton), A                                         |                                           | MP1, MP2 and MP3 (Pollachar Marsh, Howmore), A                                  | Feeding on flowers, especially umbellifer heads. Abundant.                                                                                                      |
| <i>Cheilosia latifrons</i> (Zetterstedt, 1843) | MP3 8.8.02    | MWDD1 (Newton)                                                                             |                                           |                                                                                 | A single specimen from Newton was a new record for North Uist (McCullough and Wakeham-Dawson 2001).                                                             |
| <i>Chrysotoxum arcuatum</i> (Linnaeus, 1758)   |               | S, unconfirmed sighting only                                                               |                                           |                                                                                 |                                                                                                                                                                 |
| <i>Episyrphus balteatus</i> (De Geer, 1776)    | MWDD3 25.7.01 | MWDD2, MWDD3 (Newton), MP3, A, W (Baleshare)                                               | MP2 17.7.99 (Eilean na Cille, Oban uaine) | MP2, MP3, A, W, S                                                               | Widespread but infrequent.                                                                                                                                      |
| <i>Eristalis aeneus</i> (Scopoli, 1763)        |               |                                                                                            |                                           | MP3 (Na Pairceann, Eriskay, 7.8.02), A, W                                       |                                                                                                                                                                 |



|                                                | Berneray                               | North Uist                                                                                                                            | Benbecula                      | South Uist (inc. Eriskay)                                                                         | Notes on habitat and frequency (based, unless otherwise stated, on observations made mainly on North Uist by AMcC and AWD)                                 |
|------------------------------------------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Eristalis sepulchralis</i> (Linnaeus, 1758) |                                        | MWD2, MWD3, A, WA                                                                                                                     | MP2 (Eilean na Cille, 17.7.99) | MP1 (Allt volgaire, Rubha na Meirne), MP3 (Arimnabane area), A, W                                 | In North Uist only found on Newton peninsula; rare. One female was seen inspecting the carcass of a <i>P. homophylus</i> that had been killed by a spider. |
| <i>Eristalis abasivus</i> Collin, 1931         | MWD3 25.7.01, MP3 8.8.02               | MWD1, MWD2, MWD3 (Baleshare, Balramald, Newton), MP3 (Loch na Morgha), A, WA                                                          |                                | MP2 (Eriskay, 22.7.99), A, S, WA                                                                  | Macchair, abundant.                                                                                                                                        |
| <i>Eristalis arbustorum</i> (Linnaeus, 1758)   |                                        | A, WA                                                                                                                                 |                                | MP1, MP3, A, W, S, WA                                                                             |                                                                                                                                                            |
| <i>Eristalis horticola</i> (De Geer, 1776)     |                                        | WA                                                                                                                                    |                                | WA                                                                                                | No record in North Uist since 1960 according to WA.                                                                                                        |
| <i>Eristalis interruptus</i> (Podia, 1761)     |                                        | A                                                                                                                                     |                                | MP2 (Howmore, 24.7.99)                                                                            | Record from North Uist was before 1979 according to A.                                                                                                     |
| <i>Eristalis intricatus</i> (Linnaeus, 1758)   | MWD2 01.8.00, MWD3 25.7.01, MP3 8.8.02 | MWD1, MWD2, MWD3 (Newton, Balramald, Weaver's Point), MP3 (Loch na Morgha), A, S, WA, Also Newton, 30.5.1998 (AWD unpublished record) | MP2 (Eilean na Cille, 17.7.99) | MP1, MP2 and MP3 (Allt volgaire, Howmore, Arimnabane area, Pollachar Marsh and Eriskay), A, W, WA | Abundant and widespread in macchair, often feeding on flowers or (males) hovering about 2m above ground.                                                   |
| <i>Eristalis pectinax</i> (Scopoli, 1763)      |                                        | MP3 (Loch na Morgha, 8.8.02)                                                                                                          |                                | MP1 (Allt volgaire), MP3 (Arimnabane area, Na Pairceanan), A, M                                   | MWD1 (Skye only).                                                                                                                                          |
| <i>Eupodes corollae</i> (Fabricius, 1794)      | MWD3 25.7.01, MP3 8.8.02               | MWD1 (Newton), MP3 (Loch na Morgha), A, S                                                                                             |                                | MP1, MP2 and MP3 (Howmore, Locheynart, Pollachar Marsh and Eriskay), A, W, S                      | Macchair, local and infrequent.                                                                                                                            |
| <i>Eupodes latifasciatus</i> (Macquart, 1829)  |                                        |                                                                                                                                       |                                | A                                                                                                 |                                                                                                                                                            |



|                                               | Berneray                     | North Uist                                                                                         | Benbecula                      | South Uist (inc. Eriskay)                                                                                           | Notes on habitat and frequency (based, unless otherwise stated, on observations made mainly on North Uist by AMcC and AWD)                                                                                                       |
|-----------------------------------------------|------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Eupodides limiger</i> (Meigen, 1822)       |                              |                                                                                                    | MP2 (Eilean na Cille, 17.7.99) | MP1 and MP2 (both Pollachar Marsh), A                                                                               |                                                                                                                                                                                                                                  |
| <i>Helophilus hybridus</i> Loew, 1846         |                              | A. S                                                                                               |                                | A. S                                                                                                                |                                                                                                                                                                                                                                  |
| <i>Helophilus pendulus</i> (Linnaeus, 1758)   | MWD2 2.8.00,<br>MWD3 25.7.01 | MWD1, MWD2, MWD3 (Newton, Cladach Chirebist), MP3 (Loch na Morgha), A. W (Baleshare lochside), W.A |                                | MP1 and MP2 (Allt volgar, Arinambane area, Gearraidh na Manadh, Howmore, Pollachar Marsh and Eriskay), A. W, S, W.A | Widespread and common in machair and ditches.                                                                                                                                                                                    |
| <i>Lejogaster metallina</i> (Fabricius, 1781) |                              | MWD1 (Solais), A. W (Baleshare lochside), S, W.A                                                   | A. W                           | MP1 (Rubha na Meine), MP2 (Howmore, Pollachar Marsh and Eriskay), A. W, S, W.A                                      | In frequent in machair.                                                                                                                                                                                                          |
| <i>Melanogaster hirtella</i> Loew, 1843       | MWD3 25.7.01                 | MWD3 (Newton), A. M, W                                                                             | A. W                           | MP1 and MP2 (Pollachar Marsh and Eriskay), A. W, W.A                                                                | Despite the observation of W that this is 'Abundant in many wetland areas', AMcC and AWD have found it rare and localised at Newton and on Berneray, restricted to wet areas of machair, often feeding on <i>Ranunculus</i> spp. |
| <i>Melanostoma dubium</i> (Zetterstedt, 1837) |                              |                                                                                                    |                                | A. W (female from top of Beinn Mhor)                                                                                |                                                                                                                                                                                                                                  |
| <i>Melanostoma mellinum</i> (Linnaeus, 1758)  | MP3 8.8.02                   | MWD1, MWD2 (Weaver's Point), A. W, S, W.A. Also at Weaver's Point on 29.5.1998 (AWD)               | MP2 (Eilean na Cille), W.A     | A. W, S, W.A                                                                                                        | Found by AMcC and AWD only in <i>Eriophorum vaginatum</i> -rich moorland near Weaver's Point, Lochmaddy, although others have found it to be distributed more widely in North Uist.                                              |
| <i>Melanostoma sclerale</i> (Fabricius, 1794) | MP3 8.8.02                   | MWD1 (Weaver's Point), A; W, W.A                                                                   | MP2 (Eilean na Cille), A       | MP1, MP2 and MP3 (present at most sites visited), A. W, S                                                           | 'A very widespread and common species' according to W, but AMcC and AWD have found only a single specimen on North Uist in <i>Eriophorum vaginatum</i> -rich moorland near Weaver's Point, Lochmaddy.                            |

|                                                     | Berneray   | North Uist                                                          | Benbecula                                                 | South Uist (inc. Eriskay)                                               | Notes on habitat and frequency (based, unless otherwise stated, on observations made mainly on North Uist by A McC and AWD)                                                         |
|-----------------------------------------------------|------------|---------------------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Melospiza arcticollis</i> (Meigen, 1822)         |            |                                                                     |                                                           | MP3 (Arimahane area, 6.8.02)                                            |                                                                                                                                                                                     |
| <i>Nesocitta pusilla</i> (Fabricius, 1775)          |            |                                                                     |                                                           | MP3 (Arimahane area, 6.8.02)                                            |                                                                                                                                                                                     |
| <i>Nesocitta tenuis</i> (Harris, 1780)              |            | A, S, WA                                                            | A, W                                                      | MP1 and MP2 (Allt volgar, Pollachar Marsh, Rubha na Meine), A, W, S, WA |                                                                                                                                                                                     |
| <i>Pipiscilla vidua</i> (Linnaeus, 1758)            |            | A, M                                                                |                                                           |                                                                         |                                                                                                                                                                                     |
| <i>Platycircus alpinus</i> (Fabricius, 1781)        |            | MWD1, MWD3 (Newton), MP3 (Loch na Morgha), WA                       | MP2 (Eilean na Cille, Oban uaine)                         | MP1, MP2 and MP3 (most sites visited), A, W, WA                         | Uncommon and local in wet ditches on North Uist. Also at Broadford, Skye on 30.7.1999.                                                                                              |
| <i>Platycircus angustatus</i> (Zetterstedt, 1843)   |            | MP3 (Loch na Morgha)                                                | MP2 (Eilean na Cille, Oban uaine)                         | MP1, MP2 and MP3 (most sites visited), A, W (Loch Kildonan)             |                                                                                                                                                                                     |
| <i>Platycircus clypeatus</i> (Meigen, 1822)         | MP3 8.8.02 | MWD1 (Newton), A, WA                                                | A: MP1 (Oban uaine), W (sensus stricto), WA (sensus lato) | MP1, MP2 and MP3 (most sites visited), A, S, WA (sensus lato)           | In machair, local and uncommon on North Uist.                                                                                                                                       |
| <i>Platycircus immarginatus</i> (Zetterstedt, 1849) |            | W (Baleshare Loch, 1 male)                                          |                                                           |                                                                         | One record in W, but not mapped in A.                                                                                                                                               |
| <i>Platycircus montanus</i> (Meigen, 1822)          | MP3 8.8.02 | MWD1, MWD2, MWD3 (Cladaich Chirebist, Newton, Balrarnald), A, W, WA | MP2 (Eilean na Cille, 17.7.99), A, W                      | MP1, MP2 and MP3 (most sites visited), A, W, S, WA                      | Widespread and common in machair. The only species recorded in the Monach Islands (off NW coast of North Uist) during a one-day visit in 1999 (McCullough and Wakeham-Dawson 2001). |

|                                                                                        | Berneray      | North Uist                                                                      | Benbecula                      | South Uist (inc. Eriskay)                                                                          | Notes on habitat and frequency (based, unless otherwise stated, on observations made mainly on North Uist by AMeC and AWD).                                                               |
|----------------------------------------------------------------------------------------|---------------|---------------------------------------------------------------------------------|--------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Platycheirus pelatus</i> (Meigen, 1822)                                             |               |                                                                                 |                                | MP2 (Pollachar Marsh). A (both sensu stricto and sensu lato). S (sensu lato). WA (sensu lato) A. W |                                                                                                                                                                                           |
| <i>Platycheirus podagratus</i> (Zetterstedt, 1838)                                     |               |                                                                                 |                                | MP2 (Eriskay 22.7.99). MP3 (Collage, Eriskay, 5.8.02). A. W                                        | Paratypes were from South Uist: split from <i>P. clypeatus</i> .                                                                                                                          |
| <i>Platycheirus ransauensis</i> Goodfellow & Nielsen, 1990                             |               |                                                                                 |                                | MP2 (Howmore, Eriskay). MP3 (Na Paireannan). A. W. WA                                              | Single specimen from wet pasture on Berneray (MWD3).                                                                                                                                      |
| <i>Platycheirus scanbuis</i> (Stueger, 1843)                                           | MWD3, 25.7.01 |                                                                                 | W                              | A. W (Loch Kildonan)                                                                               | Needs confirmation in view of finding of <i>P. splendidus</i> .                                                                                                                           |
| <i>Platycheirus scutatus</i> (Meigen, 1822)                                            |               |                                                                                 |                                | MP2 (Allt volgaire, 24.7.99)                                                                       |                                                                                                                                                                                           |
| <i>Platycheirus splendidus</i> Rotheray, 1998                                          |               |                                                                                 |                                | MP1 (Pollachar Marsh). MP2 (Pollachar Marsh, Eriskay). A. W                                        | Local in wet ditches and marshes, especially in association with <i>Phragmites</i> stands.                                                                                                |
| <i>Platycheirus</i> (subgenus <i>Pyrrhotaenia</i> ) <i>granditarsus</i> (Westw., 1771) | MWD3, 25.7.01 | MWD3 (Newton, Cladich Chreabost)                                                |                                | MP1 and MP2 (Allt volgaire, Howmore, Pollachar Marsh, Eriskay). A. W. S. WA                        | Abundant, especially where livestock grazing.                                                                                                                                             |
| <i>Rhagothrips campestris</i> Meigen, 1822                                             | MWD3, 25.7.01 | MWD1, MWD2, MWD3 (Baleshare, Newton, Sollas). MP3 (Loch na Morgha). A. W. S. WA |                                | A. W (summit of Beinn Mhor)                                                                        | WA North Uist record is from before 1960 and not verified by specimen.                                                                                                                    |
| <i>Sericomyia lappona</i> (Linnaeus, 1758)                                             |               | MWD1, MWD2, MWD3 (Newton, on Ben Mhor at 190m, Weaver's Point).                 | MP2 (Eilean na Cille, 17.7.99) | MP1 and MP2 (Allt volgaire, Eriskay). A. W. S. WA                                                  | Usually occurring singly in moorland. Males found hill-topping. North Uist specimens have variable, but rather paler than typical, tergite bars (see McCullough and Wakeham-Dawson 2001). |

|                                                   | Berneray                          | North Uist                                                                              | Benbecula | South Uist inc. Eriskay                                                               | Notes on habitat and frequency (based, unless otherwise stated, on observations made mainly on North Uist by AMcC and AWD)                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Sphaerophoria</i> species                      |                                   | MWD1 (1 indeterminate female in <i>E. vaginatum</i> -rich moorland near Weaver's Point) |           | S                                                                                     | Single specimen from North Uist (MWD1).                                                                                                                                                                                                                                                                                                                                                                     |
| <i>Sphaerophoria interrupta</i> (Fabricius, 1805) |                                   |                                                                                         |           | MP2 (Pollachar Marsh, 17.7.99), MP3 (Na Pairceannan, Eriskay, 7.8.02), A              |                                                                                                                                                                                                                                                                                                                                                                                                             |
| <i>Styrtia pipiens</i> (Linnaeus, 1758)           | MWD3<br>25.7.01,<br>MP3<br>8.8.02 | WA                                                                                      | W         | MP1 (Pollachar Marsh, Eriskay), MP2 (Howmore), A, W, WA                               | Sand dunes with marram grass. AMcC and AWD found only a single female on Berneray (MWD3).                                                                                                                                                                                                                                                                                                                   |
| <i>Syrphus ribesii</i> (Linnaeus, 1758)           |                                   |                                                                                         |           | MP3 (Na Pairceannan, 7.8.02), A, W (Loch Druidbeg island)                             | "An abundant British species apparently quite rare on the islands" according to W.                                                                                                                                                                                                                                                                                                                          |
| <i>Syrphus vartianus</i> Meigen, 1822             |                                   | MWD1, MWD2, MWD3 (Newton, Ballymaldy), A, S                                             |           | A, S, WA                                                                              | Machair, relatively common.                                                                                                                                                                                                                                                                                                                                                                                 |
| <i>Trichopsomyia flavitarsis</i> (Meigen, 1822)   |                                   |                                                                                         | A, W      | MP1 (Eriskay NF791), 9.7.97), A, W                                                    |                                                                                                                                                                                                                                                                                                                                                                                                             |
| <i>Tropidia scita</i> (Harris, 1780)              |                                   |                                                                                         |           | A, M, W                                                                               | "Swept from <i>Eleocharis</i> on the western shore of Loch Kildonan" by W.                                                                                                                                                                                                                                                                                                                                  |
| <i>Valucella hombylans</i> (Linnaeus, 1758)       | MWD3<br>25.7.01                   | MWD2 (Newton, Ballymaldy), WA                                                           |           | MP1 (Alt volgaire), MP2 (Pollachar Marsh, Eriskay), MP3 (Na Pairceannan), A, W, S, WA | Contrary to W, who reported 'only found in the vicinity of trees', we have found this species in areas devoid of trees, feeding on sea rocket ( <i>Cakile maritima</i> ) on the beach and other flowers in sand dunes. It was locally common in 2000, but not seen in 1999 and only seen on Berneray in 2001. Both red-tailed and white-tailed forms have been observed, but the latter is the more common. |
| <i>Xanthandrus comus</i> (Harris, 1780)           |                                   |                                                                                         |           | MP3 (Arimambane area, 6.8.02)                                                         | In a small area of mostly non-native trees and shrubs with many flowers.                                                                                                                                                                                                                                                                                                                                    |

## A note on the life history and immature stages of *Chirosia griseifrons* (Séguy, 1923) (Diptera, Anthomyiidae)

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### Summary

De Meijere (1911) described the life history and immature stages of *Chirosia latipennis* (Zetterstedt, 1838). Examination of the original reared material has shown that he misidentified the species involved, and that the information in his paper actually refers to *Chirosia griseifrons* (Séguy, 1923).

### Introduction

The immature stages and life history of a species identified as *Chirosia latipennis* (Zetterstedt, 1838) were first recorded by de Meijere (1911). He collected larvae from the leaf stems of the lady fern *Athyrium filix-femina* near Hilversum, Belgium in 1903-1904.

All subsequent authors who mentioned anything about the food plant of *latipennis* repeated de Meijere's record (Stein 1916:151; Séguy 1923:97; Collin 1955: 99; Dušek 1969:28-28). Stein pointed out that the description of the adult fly by de Meijere did not mention the cylindrical form of the abdomen in the male, but assumed that this was because the material was reared and therefore not fully hardened.

The genus *Acrostilpna* (type-species *latipennis* Zetterstedt) was erected by Ringdahl in 1929 for several species of *Hylemya* possessing a posteroventral seta on the hind tibia. Hennig (1966a:48) also included *latipennis* in *Acrostilpna*. Barták *et al.* (1990:443) synonymized *Acrostilpna* with *Chirosia* Rondani, presumably because *latipennis* was believed to have been reared from ferns. *Chirosia latipennis* is probably more correctly placed in *Lasiomma* (Griffiths *in litt.*), but in this paper I retain the species in *Chirosia* (for the time being) to avoid confusion.

Dr G.C.D. Griffiths (*in litt.*, 31.x.2001) expressed some doubt about whether *Acrostilpna* species really develop in ferns, because of the occurrence of some species of the genus in arid inland districts in North America, where woodland ferns are decidedly rare. He suggested that I attempt to locate and borrow de Meijere's reared material. Dr Ben Brugge of the Zoological Museum, Amsterdam very kindly sent me the following specimens from de Meijere's collection under the name "*Chortophila latipennis* Zett."). The species named at the beginning of the details of each specimen is my identification, and I have so labelled the specimens.

### Material examined

There were 7 adult flies and 3 other examples of dried plants and puparia as follows:

1. *Chirosia latipennis* (Zett.) ♂. No data labels on the pin.
2. *Chirosia latipennis* (Zett.) ♀. Labelled: "*Chortophila latipennis* ♀. Stein det. '09", "VERTEGEN WOORDIGER", and "sp. 16 II a".
3. *Chirosia griseifrons* (Séguy) ♂. Labelled: "*Chortophila latipennis* Zett.", "Stein det. 1909", "Varenbosch", Vuursche, 5.vi.05, d. M."
4. *Chirosia griseifrons* (Séguy) ♀. Labelled: "Varenbosch", "Vuursche, 5.vi.05. d. M."
5. *Chirosia griseifrons* (Séguy) ♀. Labelled: "Uit bladsteel. v. *Athyrium filix femina*, Vuursche, 23.v.03, d. M.", "wahrscheinlich: *Acanthiptera signata* Brischke", and a partly illegible label which contains "♂" and "*Chortophila*".

6. *Chirosia griseifrons* (Séguy) ♀. Labelled: "Uit bladsteel v. Athyrium. 29.v.05, Vuursche, d. M."
7. *Chirosia griseifrons* (Séguy) ♀. Labelled: "Hilversum, d. M."
8. 1 puparium. Labelled: "Uit bladsteel, v. Athyrium filix femina, imago, v.03, d. M."
9. Dried plant remains and tube containing puparium. Labelled: "Vuursche, in bladsteel von Athyrium fil-fem., 30.vii.02"
10. Dried plant remains. Labelled: "Uit bladsteel, v. Athyrium, [illegible], Hilversum".

Specimen 1 has no labels of any sort; specimen 2 is probably an example that was regarded as a reference specimen, returned to de Meijere by Stein. It carries no locality label. The remaining material, of which the adult flies (1♂, 5♀) are all *Chirosia griseifrons* (Séguy 1923), must be part at least of the material on which de Meijere based his descriptions of '*Chortophila latipennis*' in his 1911 paper. Although the locality 'Vuursche' is not mentioned in that paper, de Meijere described the locality where he collected specimens as follows: "Etwas eine Stunde südwärts von Hilversum findet sich in der Gemeinde Maartensdijk eine dicht mit *Pteris aquilina* bewachsene Stelle im Kiefernwald. Längs derselben verläuft ein im Sommer grösstenteils ausgetrockneter Graben, welcher an der einen Seite mit zahlreichen Farnen verschiedener Arten bewachsen ist." Vuursche is between 5 and 10 km south of Hilversum (depending upon where in Hilversum the starting point is; no doubt it was somewhat smaller in 1911 than it is today). One hour southwards would be a reasonable walking time for the distance. In any case specimens 5, 6, and 8 all carry a label stating that they were reared from *Athyrium*.

Dr Brugge informs me that "Varenbosch" (modern spelling in Dutch "Varenbos") is probably a local name for a wood with a lot of ferns.

#### **Adult characters of *Chirosia griseifrons* and *Chirosia latipennis*.**

The male genitalia of *Chirosia griseifrons* were figured by Hennig (1976: 932, Textfig. 755, Pl. CXL fig. 1187) and those of *Chirosia latipennis* by Hennig (1966a, Pl. II, fig. 34; Pl. III, fig. 38, 1966b: Pl. VI, fig. 92). They differ considerably, but the processes of the 5th sternite in *griseifrons* have at their bases a long tuft of setae (visible without dissection) and on their inner margins basally there is a patch of shorter setae. These are absent in *latipennis*. Both sexes of *latipennis* possess cruciate interfrontal setulae (weakly expressed in the male but strong in the female) and the mouth margin is produced forwards; the mentum of the proboscis is longer and mainly shining, and in the female the 5th abdominal tergite is not laterally compressed and does not have long lateral and hindmarginal setae. *Chirosia griseifrons* has no cruciate interfrontal setulae in either sex, the mouth margin is not projecting in front of the level of profrons, and the upper frontal setae are long, almost as long as the anterior setae; the mentum of the proboscis is short and narrow and hardly shining; in the female the 5th abdominal tergite is strongly laterally compressed and (together with the 4th tergite) carries some long and strong hindmarginal setae.

#### **Immature stages of *Chirosia griseifrons***

According to de Meijere (1911: 106): "the mines of this fly [as '*Chortophila latipennis*'] are found in leaf stems of *Athyrium filix-femina*, and run through the whole leaf stem and end in the leaf sheath. This also becomes partly bored through, then however the larva turns around and leaves the mine by a hole, which was made on top of the convex outer surface. The attacked leaf stems are recognised by their blackish colour and small dried leaf surface."

I interpret this as meaning that the egg (not mentioned by de Meijere) is probably laid on the apical pinnules or pinnule rachis, the young larva burrows into the rachis and mines downwards towards the petiole. Further observations are needed to clarify the exact details. The only other *Chirosia* species so far recorded from *Athyrium* is *C. betuleti* (Ringdahl) (=

*signata* (Brischke)), which feeds on the rolled-up fronds (de Meijere 1911:82). *C. albitarsis* (Zetterstedt) and *C. crassiset*a (Stein) are the only other known fern rachis feeders on *Pteridium aquilinum* (Brown and McGavin 1982: 514).

The adult larvae are about 7mm long and of a yellowish white to straw yellow colour; no special projections are found on the last segment and the whole surface appears smooth. Microscopically the fore margins of the segmental belt have dense small tiny blunt warts. The main character is a matt black spot on the prothorax between the two anterior spiracles. The posterior spiracles are very close together and hardly project.

The mouth parts (cephalopharyngeal skeleton) were figured by de Meijere (1911: plate 6, fig. 22) showing that the upper processes (dorsal wing plates) are divided into two, and the mouth hook has only one tooth and is short and solid.

Stork (1936: 136) evidently based her description on the material reared by de Meijere, and quoted from the latter's 1911 paper (erroneously given as 1907). She gave a figure of the puparium. Dušek (1969: 28-29, and plates III, X) described the third instar larva and puparium of "*Phorbia latipennis* (Zetterstedt, 1838)", and also cited de Meijere as the authority for his identification.

In the material from de Meijere's collection I examined specimens numbered 8, 9, 10. The puparia agree exactly with Stork's description and figures. The puparium in No 9 has a cephalopharyngeal skeleton within the shell, and agrees with de Meijere's figure and description.

### Distribution

*Chirosia griseifrons* is widely distributed in the Palaearctic region, recorded from Britain (Collin 1955), Sweden, Denmark, Germany, France, Russia (Hennig 1976), Korea (Kwon and Suh 1982) and Japan (Suwa 1977). In Britain it is widely distributed but probably local, following the distribution of the lady fern. It appears not to occur in North America (Griffiths *in litt.*). I have seen specimens of *C. griseifrons* from the following Vice Counties: N. Somerset, N. Devon, S. Devon, W. Cornwall, Dorset, S. Hampshire, W. Kent, W. Suffolk, E. Norfolk, Worcestershire, Salop, Merioneth, Durham, W. Perth.

### Conclusions

The discovery that *Chirosia griseifrons* is a fern feeder is evidence for the view that it is correctly placed in *Chirosia*, or close to that genus, even though the male genitalia differ in several respects from the majority of species placed in that genus (type species *albitarsis* Zetterstedt) which have simple short surstyli and the 5th sternite without long basal tufts of setae. The species (as *watanabei* Suwa) was included in *Meliniella* by Suwa (1977: 3) (see also Ackland 1989: 219). The larval foodplant and life history of *Chirosia latipennis* remain unknown.

### Acknowledgements

I would like to thank Dr Ben Brugge and the authorities of the Zoological Museum, Amsterdam for the loan of material. I also thank Dr Griffiths for suggesting this investigation, and for reading the manuscript and making valuable changes, and Professor S.J. Simpson, Curator, Hope Entomological Collections, Oxford, who gave access to collections and research facilities. Barbara Schulten helped me with the translation of de Meijere's paper, and I thank Dr G.C. McGavin for help and advice on anthomyiid larvae feeding on ferns and bracken.

## References

- Ackland, D. M. 1989. Anthomyiidae (Dipt.) new to Britain, with a description of a new species of *Botanophila* Lioy. *Entomologist's monthly Magazine* **125**, 211-230.
- Brown, V. K. and McGavin, G. C. 1982. The biology of some mine and gall forming Diptera on bracken, *Pteridium aquilinum* (L.) Kühn. *Journal of Natural History* **16**, 511-518.
- Barták, M., Michelsen, M. and Rozkošný, R. 1990. New records of Anthomyiidae from Czechoslovakia, with a revised checklist of Czechoslovak species (Diptera). *Scripta* **20**(9-10), 439-450.
- Collin, J. E. 1955. Genera and species of Anthomyiidae allied to *Chirosia* (Diptera). *Journal of the Society for British Entomology* **5**, 94-100.
- De Meijere, J. C. H. 1911a. Über in Farnen parasitierende Hymenopteren- und Dipteren-Larven. *Tijdschrift voor Entomologie*, Amsterdam **54**, 80-127.
- Dušek, J. 1969. Präimaginale Stadium mitteleuropäischer Anthomyiden (Diptera). I., *Acta Scientiarum Bohemoslavacae Prirodovedne Prace ustavu Ceskoslovenske Akademie ved v Brne, Nova Serie* **3**(2): 1-37, 3 plates.
- Hennig, W. 1966a. Fam. 63a. Anthomyiidae. Lieferung **262**, 1-48. In: Lindner, E. (Ed.), *Fliegen der palaearktischen Region*. Schweizerbart, Stuttgart
- Hennig, W. 1966b. Fam. 63a. Anthomyiidae. Lieferung **268**, 49-96. In: Lindner, E. (Ed.), *Fliegen der palaearktischen Region*. Schweizerbart, Stuttgart.
- Hennig, W. 1976. Fam. 63a. Anthomyiidae. Lieferung **314**, 921-974. In: Lindner, E. (Ed.), *Fliegen der palaearktischen Region*. Schweizerbart, Stuttgart
- Kwon, Y. J. and Suh, S. J. 1982. Classification of the Anthomyiidae from Korea (1), (Diptera: Calypttratae). *Korean Journal of Plant Protection* **21**(2), 99-102.
- Séguy, E. 1923. Diptères Anthomyiides. *Faune de France* **6**, 1-393. Paris.
- Stein, P. 1916. Die Anthomyiden Europas. Tabellen zur Bestimmung der Gattungen und aller mir bekannten Arten, nebst mehr oder weniger ausführlichen Beschreibungen. *Archiv für Naturgeschichte* Abt. A, **81**, 1-224.
- Stork, M. N. 1936. A contribution to the knowledge of the puparia of Anthomyiidae. *Tijdschrift voor Entomologie* **79**, 94-167.
- Suwa, M. 1977. Supplementary notes on the family Anthomyiidae of Japan I (Diptera). *Insecta matsumurana n.s.* **10**, 1-16.



## ***Odinia czernyi* Collin (Diptera, Odiniidae) new to Britain.**

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### **Summary**

*Odinia czernyi* Collin is introduced to the British fauna, based on specimens taken in association with conifers in the Scottish Highlands. The male genitalia and aspects of the puparium are figured.

### **Introduction**

During July 1997 we collected three adult females of a large odiniid from cut spruce (*Picea* species) logs near Dunkeld, Perthshire. They were of a species that we did not recognise from our past work on saproxylic insects. By reference to the key by Collin (1952) we tentatively identified these as *Odinia czernyi* Collin. This species was introduced by Collin (1952) in his review of the European Odiniidae and was described from the holotype male in the Vienna Museum, collected by Czerny in Austria. With a body length of some 4mm it is one of the largest of the European species and can be differentiated from the other known British species by its combination of darkened basal antennal segments, frons with a few small hairs near the eye margin between the posterior orbital and the vertical bristle, virtually bare eyes and by having no median brown stripe on the thoracic disc.

A further adult male that exhibited these characters emerged from a puparium collected in June 1998. Subsequently we were able to obtain Finnish material of *O. czernyi* from the Copenhagen Zoological Museum and Russian material from the Naturhistorisches Museum, Vienna, which allowed us to check our earlier identification and thus confirm the addition of *O. czernyi* to the British fauna. The Scottish specimens agree with the type description and the Finnish and Russian specimens apart from the fact that in the Scottish specimens the second antennal segment is entirely sooty black rather than yellow at the apex. In comparison with the genitalia of the Russian male that of the Scottish male has slightly larger cerci and in general slightly stronger setulae including an additional pair on the upper part of the surstyli. We do not consider these differences to be significant.

### **Description of the adult**

**Male:** Eyes bare, lunule, face and jowls silver. Jowls with black bristles below eye and extending anteriorly along mouth edge where they gradually get stronger, ending in a strong vibrissal bristle. Palp yellow with black bristles. Three pairs of orbital bristles, the anterior pair crossed above antennae. Short black hairs extending as a scattered row across the frons, in the area between the two orbital bristles, several of these hairs occurring between the orbital bristles and the eye margin (usually in the vicinity of the orbital bristle bases). In specimens examined 2, occasionally 4, short black hairs on each side on eye margin between upper orbital and vertical bristle. In Scottish specimens antenna with segments 1 and 2 black, third light yellow apart from a black dorso-apical black spot, which covers about 25% of the surface of this segment. Thoracic disc light grey with two indistinct broad brownish stripes between dorsocentral rows on posterior half; 5 dorsocentral bristles and remainder of thoracic disc covered in short, rather sparse black hairs, these not extending below the level of the pre-alar bristle. Humerus (= postpronotum) only slightly yellowish. Scutellum bare apart from the lateral bristles, a faint brown stripe extending anteriorly from wing base along upper part of

anepisternum. Anepisternum and anepimeron silvery and without hairs. Katepisternum with a row of hairs and 3 strong bristles along dorsal edge, the anterior strong bristle very long, otherwise with a scattering of short hairs on lower parts. Squamal fringe pale, wings with cross-veins and costal break infuscated. Abdomen greyish with indistinct paired brown spots on tergites. Fore and mid legs with yellowish femora, tibiae ringed with black centrally and at apex; tarsi yellow. Mid tibia with two strong ventral spines, the anterior one only slightly longer than the posterior. Hind femur darkened, shorter than mid tibia and twice as thick, one long anteroventral bristle near apex with some shorter bristles positioned apically from it. Hind tibia ringed as anterior pairs but shorter and darker, with a single dorsal bristle apically; hind tarsus dark.

Epandrium broader than high with sparse hairing over much of its surface, with a claw and peg like structure on the ventral edge. Cercus about one third as high as the epandrium, simple, with a few hairs at the apex (Fig. 1 & 2)

**Female:** as male but legs in general lighter in colour with hind femur yellow, longer and not so thickened.

Length of body: 4.0-4.5mm; wing: 3.5-4.0mm

### Description of puparium

Puparium light reddish brown, barrel-shaped and about 5mm long and 1.6mm in diameter at the middle (Fig. 3). The depression on the 5th abdominal segment is a distortion caused by the puparium developing while held in the narrow exit hole of a scolytid beetle. There are ventral creeping welts, all similar, on abdominal segments 2-7 (Fig. 5). The locomotory spinules on the creeping welts are in 3-4 rows, triangular in shape, flat, lie vertically and are aligned along the long axis of the puparium. The anterior spiracles (Fig. 6) are short and palmate with eleven short papillae projecting marginally from the expanded apex. The posterior spiracles are slightly domed and criss-crossed by ribs (Fig. 4). The cephalopharyngeal skeleton (Fig. 7, 8) consists of a pharyngeal sclerite, H-shaped hypopharynx, long parastomal bars and a mandible. The mandible is simple in shape, curved and blunt-pointed with distinct posterodorsal, caudal and ventral processes. The hypopharynx is free from the pharyngeal sclerite (Figs 7, 8).

### Material examined

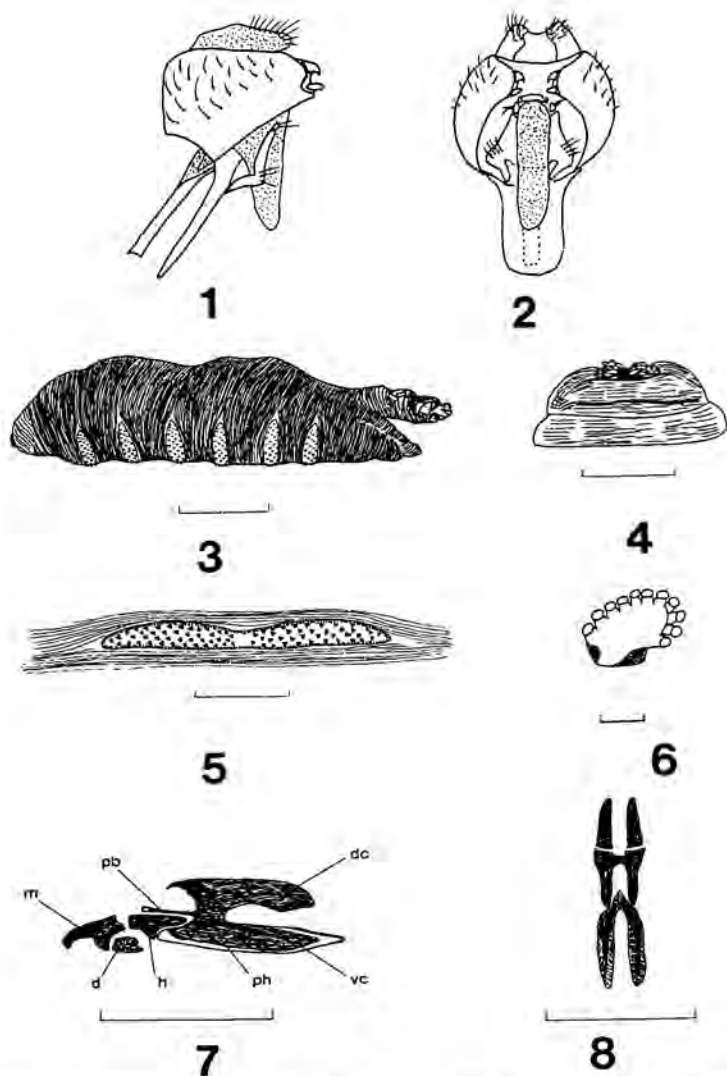
SCOTLAND: 1♀, 9.vii.1997, 2♀, 21.vii.1997, Craig Vinean Forest, Dunkeld, Perthshire, on *Picea* species logs, I. MacGowan; 1♂, 10.v.1998, Rannoch, Perthshire ex puparium in *Picea abies* stump, D. Horsfield; 1♀, 27.vi.2002, Birnam, Perthshire, on *Picea* species logs, I. MacGowan. Specimens in National Museums of Scotland.

FINLAND: 1♀, Kb. Joensuu, Liperi, Liperinsalo, 9.viii. 1982, O. Martin; also 1♀ without legible data, Copenhagen Zoological Museum.

RUSSIA: 1♂, 1♀, Wologda, 28.5.1983, N. Krivosheina, Naturhistorisches Museum, Vienna

### Observations

The puparium was found wedged in an exit hole of a bark beetle (Coleoptera, Scolytidae) in the bark of a Norway spruce (*Picea abies*) stump on 10 May 1998, the adult emerging on 19 May 1998. The stump was in the primary stage of decay with decaying bast (cambium plus phloem) layer under the bark. Larvae and adults of the bark beetle *Dryocoetes autographus* (Ratzeburg), had extensively tunnelled the bast (or inner bark) and outer sapwood. The Dunkeld females were taken on two separate occasions on a pile of cut logs of a *Picea* species, lying at the roadside in a forestry plantation at about midday in full sun. The Birnam female was taken in a similar situation on roadside logs. Due to the grey colour of the thorax and the abdomen closely matching the colour of the bark, the adults were not easy to locate. They moved purposefully across the bark as if looking for an oviposition site but actual oviposition was not observed.



Figures 1-8. *Odinia czernyi* Collin. 1, male epandrium and associated structures, lateral view; 2, epandrium and associated structures, ventral view; 3, puparium, lateral view; 4, posterior end of puparium, ventral view showing spiracular area; 5, ventral creeping welt on 4th abdominal segment; 6, anterior spiracle; 7, cephalopharyngeal skeleton, lateral view: d = dental sclerite, dc = dorsal cornu, h = hypopharynx or hypostomal sclerite, m = mandible, pb = parastomal bar, ph = pharyngeal sclerite, vc = ventral cornu; 8, cephalopharyngeal skeleton, dorsal view.

With a male emerging on 19 May and females still active in late July it would appear that this species is on the wing for much of the summer. The three capture sites are in Perthshire but separated from each other by a distance of some 45km, which could imply that this species is well distributed in this area. With the present records of adults and larvae being associated with spruce it is a matter of conjecture as to whether *O. czernyi* is a long term resident of the British Isles, in which case it must also rely on our native Scots Pine *Pinus sylvestris*, or whether it arrived during the 20<sup>th</sup> century in association with the extensive planting of non-native conifers.

#### Acknowledgements

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#### References

- Collin, J.E. 1952. On the European species of the genus *Odinia* R.-D (Diptera: Odiniidae). *Proceedings of the Royal Entomological Society of London* (B) 21(7-8), 110-116.

***Dorycera graminum* (Fabricius) (Diptera, Ulidiidae) on trees in South Essex** - I found two specimens, a male and a female, of this very uncommon fly, in Basildon, South Essex (TQ 7190, V.C. 18) on 25.vi.2002. This species is recorded mainly from Kent where L. Clemons has recorded it erratically, but widely (1994. *Entomologist's Record and Journal of Variation* 106, 138; 1998. *loc. cit.* 110, 83-84; 1999. *Dipterists Digest (Second Series)* 6, 92). South Essex shares many attributes with North Kent, since it too bounds the Thames Estuary, so the fly's occurrence there is not unexpected. The first Essex records of *Dorycera graminum* (Fabricius) appear to have been made in 1995 at Chafford Hundred (Tattersfield, P., O'Toole, C. and Ismay, J. 1996. *Chafford Hundred, Gray's Thurrock, Essex. A survey of aculeate Hymenoptera (bees, wasps and ants) and Diptera (true flies) and recommendations for their conservation.* Penny Anderson Associates) and further records were given by J. Ismay (2000. *The status, distribution and biology of Dorycera graminum* (Fabricius) (Diptera, Ulidiidae). English Nature Research Reports, No. 395).

The life history of this fly is unknown, but Clemons (1999) reported specimens associated with elm *Ulmus* and spindle trees *Euonymus europaeus* where previously it was thought to be possibly associated with umbellifers (Apiaceae) in rough grassland. My specimens from Basildon were swept, independently, about 100 metres apart, from medium-sized (7-10 metres high) oak trees (*Quercus* species). The trees were part of a hedge also containing field maple *Acer campestre*, hawthorn *Crataegus* and elm. There was little or no herbaceous vegetation of note because the hedge formed the boundary between two large and very closely mown playing fields. The area is now scheduled for large-scale redevelopment, but the fly (along with badgers, adders and newts) is included in the environmental impact assessment of the site and some green/open space mitigation may result from its presence - **RICHARD A. JONES**, 135 Friern Road, East Dulwich, London SE22 0AZ, bugmanjones@hotmail.com

## New records of the picture-winged fly *Dorycera graminum* (Fabricius) (Diptera, Ulidiidae) from South Essex

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### Summary

New records are detailed for *Dorycera graminum* (Fabricius) (Ulidiidae) from sites in South Essex, including one site where the fly was present in exceptional numbers. Comment is made on an important metapopulation of the species in the highly threatened East Thames Corridor region.

*Dorycera graminum* is a medium sized and distinctive fly with marked wings, which was given Red Data Book Category 3 (Rare) status by Falk (1991). It was subsequently thought that the species had declined and might be reduced to only one or two dry grassland sites (Stubbs 1997). It was therefore included in the Biodiversity "Long List" (Anon 1996) and is included in English Nature's Species Recovery Program.

The biology of *D. graminum* is still uncertain and Ismay (2000) discussed various possible life histories found in the Ulidiidae. The elongate flattened head and elongated body is a feature of several flies living in the confined environment of grass, rush or sedge stems and there is some possibility that *D. graminum* may live in couch-grass *Elvirigia* (= *Agropyron*) species inflorescences. An association with umbellifers (Apiaceae) and crucifers (Brassicaceae) may simply be related to available adjacent vegetation. Alexander (1998) reported the discovery of the species at two sites with rank vegetation and concentrations of umbellifers, in one case a sheltered lane lined by flowering *Heracleum sphondylium* and in the second from *Oenanthe crocata*. Clemons (1994) swept the fly from the lower leaves of *Heracleum* and from or around *Smyrnium olusatrum*. Clemons (1999) reported it from the lower branches of an elm *Ulmus* species and a stand of *Lonicera periclymenum* in a small area of broad-leaved woodland in Kent, at a site consisting largely of grazing marsh, adjacent to the River Stour. He also reported the discovery of another individual from *Eunymus europaeus*, infested with what he presumed to be the eriophyid mite *Eriophyes convulvens* at Horton Kirby along the River Darent.

On 16 May 2002 the first author made a visit to Anchor Field (TQ591779) adjacent to Lakeside in South Essex near the M25 with the purpose of investigating its invertebrate fauna. Male and female *D. graminum* were swept in some numbers (up to half a dozen individuals per sweep) from open grassland vegetation, as well as at the base of *Crataegus* and *Ulmus* scrub. Hundreds of both sexes were present on hoary cress *Cardaria draba* flowers where these were growing in large masses at the northern end of the field, as well as in the grassland where hoary cress was also present. The fly was so numerous that I reported the discovery to the second author and we both made a second visit to the site on 23 May. Although not especially favourable weather conditions, windy with sunny and cloudy intervals, *D. graminum* was found to be the most abundant insect present. Both sexes were present in thousands on the leaves and flowers of *Cardaria draba*, as well as a *Barbarea* species, *Reseda lutea* and the leaves of *Hipsacus fullanum*. On one plant of *Reseda*, where several *Dorycera* were resting, one male was wing waving, presumably in a courtship display. Of interest was the large variation in size of both males and females, both ranging from 6 to 10mm in length.

*D. graminum* appears to have rarely been found in large numbers, the only other comparable occurrences reported being at Kingsnorth on 13 June 1992 and at Grain on 6 June

1993, both in north Kent on the Hoo peninsula (Clemons 1994) and at the Isle of Grain 14 June 1999, where large numbers were found in an area of land at a partially-worked sand and gravel quarry. Here one sweep of the net yielded 2-3 flies in some parts (Ismay 2000). The occurrence of the species in very large numbers at Anchor Field, a site close to the now mostly lost Chafford Hundred localities, suggests it may represent a core population centre, and an important site at which further research should be undertaken into the species' autecology. Unfortunately the Local Authority is currently considering the site as development land in the next Local Plan.

Other recent South Essex records of *D. graminum*, all collected by the first author and either determined or confirmed by the second author, are from Vange Heights (TQ7187) on 31 May 2000, when a single female was swept from tall open flower-rich grassland on a south facing clay slope; Blackshots Nature Area (TQ6280) on 24 May 2001, when one was caught by using a sweep net in a sparsely vegetated area within tall unmanaged grassland at the edge of and subsequently four more were swept from nearby flowers of a *Barbarea* species; Shoebury (TQ9384) on 29 June 2001, when a single *D. graminum* was beaten off a group of young pines *Pinus* species in an open grassland area but it escaped and could not be refound; the same location a week later, on 6 July 2001, when a single somewhat battered specimen was again beaten off pine, just possibly the same individual; Berwick 'Woods' (TQ537839) on 31 May 2002, when a single female was beaten off scrub edge by the side of a footpath on sands and gravels above Ingrebourne Marsh near Rainham, with old silt lagoons to the east containing areas of flower-rich grassland as well as scrub and developing woodland; Hornchurch Country Park (TQ5384) on 12 June 2002, when the species was swept in some numbers at several locations on the western side of the Ingrebourne Valley off *Heracleum sphondylium* flowers growing at the edge of flower-rich grassland by the side of a young pine plantation and in rough grassland. Three males and seven females were collected.

Evidence has been accumulating that an important metapopulation of the fly is present in the highly threatened East Thames Corridor region of southern England. Many of the sites and habitats where the fly has been recorded are either already destroyed by development, or under enormous threat from the development pressures of the 'Thames Gateway' and initiatives such as the Thames Chase Community Forest (Harvey 2000). *Dorycera* is threatened along with other nationally rare and scarce grassland invertebrate species occurring in the same region, including national Biodiversity Action Plan species such as the aculeate Hymenoptera *Bombus sylvarum* (Linnaeus), *B. humilis* Illiger and *Cerceris quinquefasciata* (Rossius).

## References

- Alexander, K. 1998. Two new localities for *Dorycera graminum* (Fabricius) (Diptera, Ulidiidae). *Dipterists Digest (Second Series)* **5**, 5.
- Anon 1996. *Biodiversity: The UK Steering Group Report, Vol. 2, Action Plans*. HMSO
- Clemons, L. 1994. Two species of Otitidae (Diptera) circumstantially associated with Umbelliferae. *Entomologist's Record and Journal of Variation* **106**, 138.
- Clemons, L. 1999. Another note on the occurrence of *Dorycera graminum* (Fabricius) (Diptera, Ulidiidae) in Kent. *Dipterists Digest (Second Series)* **6**, 92.
- Falk, S. 1991. *A review of the scarce and threatened flies of Great Britain (part 1)*. Research & Survey in Nature Conservation, number **39**. Nature Conservancy Council, Peterborough.
- Harvey, P. 2000. The East Thames Corridor: a nationally important invertebrate fauna under threat. *British Wildlife* **12**(2), 91-98.
- Ismay, J. 2000. *The status, distribution and biology of Dorycera graminum (Fabricius) (Diptera, Ulidiidae)*. English Nature Research Reports, No. 395.
- Stubbs, A. 1997. Wildlife reports: Flies. *British Wildlife* **8**(3), 190-192.

## Thirty-nine species of Diptera new to Ireland, including a species of Psychodidae new to the British Isles

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### Summary

Thirty-nine species of Diptera are newly recorded for Ireland in the families Sciaridae, Psychodidae, Scatopsidae, Empididae, Dolichopodidae, Phoridae, Curculionidae, Canacidae and Sphaeroceridae. One of these, *Sycorax fenerborni* Jung (Psychodidae) is new to the British Isles. A record is presented of *Dolichopus plumipes* var. *pectinatus* (Stenhammar), not previously recorded from the British Isles but considered likely to be an intersex of *D. plumipes* (Scopoli). Records are also given for two species of Sciaridae, *Trichosia confusa* Menzel & Mohrig and *T. splendens* Winnertz, previously recorded from Ireland but not indicated as such by Chandler (1998).

When surveying the invertebrates of an area with a view to assessing the conservation interest, it is tempting to concentrate on the large and obvious components. This may be due to the belief that, at least where insects are concerned, small is equivalent to difficult, either difficult to catch or difficult to identify. However, if one selects families that are well covered by modern literature and one uses proven trapping methods, neither of these presumptions is necessarily correct.

The author has recently been involved in sorting and determining dipteran material from two large-scale surveys. The first, in Killaun Bog, County Offaly (N1106), employed 22 water-traps during September 2000, in various areas of a peat bog prior to commercial extraction. A Malaise trap was also operated over the same period in an area not scheduled for exploitation. The second survey involved Pollardstown Fen, County Kildare (N7715), where potential alterations to the water table from road construction have led to a need to assess the fauna of some fragile microhabitat features, notably tufa formations. Here, the trapping effort has been concentrated on emergence traps and Malaise traps.

Surveys such as these generate an enormous amount of invertebrate material, and it is wise to use this selectively. For example, at Pollardstown Fen, it was decided to concentrate identification effort on a small suite of invertebrate groups which could give useful information on possible change in status of the threatened microhabitats, containing so-called indicator species. Since the "small-fry" component is often overlooked or ignored, as a consequence it has been possible to add a surprising number of species to the Irish fauna: almost all are based on determination of males. The list of additional species of Sciaridae is also based on collecting trips made specifically to improve knowledge of the Irish fauna of this family.

Lavery *et al* (1993) have indicated that the Irish fauna of Empididae is likely to be significantly under-recorded, due to a number of factors, not least the inconsistency of entomological coverage this century. Speight and de Courcy Williams (1992) have similarly indicated that, for the Dolichopodidae, some species may also be under-recorded for the same reasons. This paper adds four species of Empidoidea to the Irish fauna.

All specimens cited are in the author's collection.

### Sciaridae

Despite the difficulties of a scattered literature and the certainty that the fauna of the British Isles is seriously under-recorded, I have made some headway with this family, with assistance from notable experts. So little is known of the biology, habitat preferences or distribution that I can



do no more than record the presence in Ireland of the following new species. All records are based on determination of males.

*Bradysia dolosa* Laurence

OFFALY: Killaun Bog.

*Bradysia polonica* (Lengersdorf)

CORK: Clonpriest (X0573), 13.vii.1994.

*Bradysia pratincola* Tuomikoski

OFFALY: Killaun Bog.

*Corynoptera compressa* (Walker)

OFFALY: Killaun Bog.

*Corynoptera curvispinosa* Freeman

KILDARE: Pollardstown Fen, 8-19.viii.1999. OFFALY: Killaun Bog.

*Corynoptera globiformis* (Frey)

OFFALY: Killaun Bog

*Corynoptera irmgardis* (Lengersdorf)

KERRY: Ross Island, Killarney (V9588), 11.vii.1990. OFFALY: Charleville Wood (N3223), 15.vi.1985; Killaun Bog.

*Corynoptera membranigera* (Kieffer)

CORK: Gearagh (W2969), 9.vii.1990.

*Corynoptera parvula* (Winnertz)

CORK: Castlefreke Wood (W3335), 12.v.1989.

*Corynoptera vagula* Tuomikoski

KILDARE: Pollardstown Fen, 27.vi.2002. OFFALY: Killaun Bog.

*Cratyna (C.) pernitida* (Edwards)

OFFALY: Killaun Bog.

*Cratyna (C.) uliginosa* (Lengersdorf)

OFFALY: Killaun Bog.

*Cratyna (Peyerimhoffia) vagabunda* (Winnertz)

CORK: Gearagh (W2969), 9.vii.1990. WICKLOW: Murrough, Black Ditch Wood (O3103), 20.v-3.vi.1990.

*Cratyna (Spathobdella) falcifera* (Lengersdorf)

KILDARE: Pollardstown Fen, 8-19.viii.1999. WICKLOW: The Quill (O2419), 7.v.1989.

*Epidapus gracilis* (Walker)

OFFALY: Killaun Bog.



*Scaptosciara nana* (Winnertz)

KILDARE: Pollardstown Fen, 8-19.viii.1999. OFFALY: Killaun Bog.

*Scaptosciara pusilla* (Meigen)

This record was cited by Blackith *et al.* (1991) but a + was omitted against *pusilla* in the checklist because *pusilla* sensu Freeman (1983) was a misidentification of *S. neglecta* Menzel & Mohrig and a + was placed against *neglecta* instead (Chandler 1998). Consequently *S. neglecta* should be deleted from the Irish list.

WICKLOW: Murrough, Black Ditch Wood (O3103), 8.v.1989.

*Sciara humeralis* Zetterstedt

LONGFORD: Lough Derragh (N3979), 15.vii.1990. WESTMEATH: Scragh Bog (N4259), 15.vii.1990.

*Trichosia confusa* Menzel & Mohrig

This is *T. trochanterata* sensu Freeman, and was recorded as such by O'Connor and Ashe (1991). In consequence a + should have appeared against this name in the checklist.

WESTMEATH: Lough Ballynafid (N4161), 16.vi.1985. WICKLOW: Knocksink Wood (O2217), 17.vi.1985.

*Trichosia splendens* Winnertz

This record was published by Menzel and Mohrig in their revision of *Trichosia* (1997) but was overlooked in the compilation of the checklist. Again a + should have appeared against it.

WESTMEATH: Lough Ballynafid (N4161), 16.vi.1985.

*Xylosciara heptacantha* Tuomikoski

This record was cited as *X. lignicola* (Winnertz) by Blackith *et al.* (1991) and is the source of the + against *lignicola* in the checklist so that species should be deleted from the Irish list.

WICKLOW: Murrough, Black Ditch Wood (O3103), 8.v.1989.

## Psychodidae

The Irish Psychodidae were comprehensively documented by Withers and O'Connor (1992). It was predicted that further species would be added to the Irish list, but the following are each nevertheless surprising.

*Tinearia lativentris* Berdén

1 ♀, Pollardstown Fen. Malaise trap in *Schoenus/Juncus* tufa flush, 14-30.vii.1999; 1 ♀, Pollardstown Fen, emergence trap in *Schoenus/Juncus* tufa flush, 25.vii.2001. This species is a close relative of *T. alternata* Say, only definitely recorded as an Irish species by Blackith and Blackith (1989), although there is a female labelled Ireland and a male and female labelled "Malahoide" (sic) in Haliday's collection. The female is easily identified, which is fortunate, as no males have yet been found in the British Isles: the species may be partly parthenogenetic. In any event, *T. lativentris* is a very rare species with only a handful of scattered records.

*Psychoda crassipennis* Tonnoir

This species is a close relative of the widespread *P. phalaenoides* (Linnaeus), but much rarer, only a handful of specimens have ever been seen by the author. Oddly, it was numerous in a sample from an emergence trap in Pollardstown Fen, mixed in with *phalaenoides*, but vastly outnumbering it on 27.vi.2002.

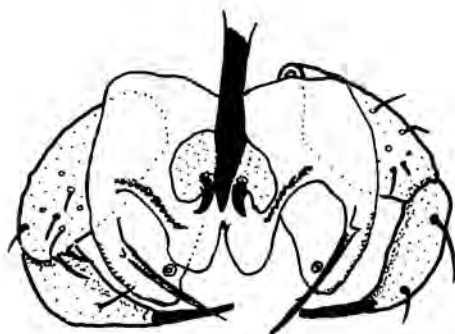


Fig. 1. *Sycorax feuerborni* Jung, male genitalia.

*Sycorax feuerborni* Jung

1 ♂, Pollardstown Fen, emergence trap, 23.vi.2001. Some *Sycorax* larvae obtained several years ago from this site were frustratingly hard to identify. Using the available key (Jung 1958) they appeared to run to a pair of species, neither known from the British Isles at all! Thankfully the dilemma is now resolved, with capture of a male of this species, hitherto unrecorded anywhere in the British Isles. The male terminalia are depicted in Fig. 1. It is worth noting that where *Sycorax* is concerned, patience is recommended: of the 300 or so specimens sorted from Pollardstown Fen, less than 10 were males.

*Tonnoiriella anchoriformis* (Salamanna)

2 ♂, Pollardstown Fen, Malaise trap, 2.vii.2001; 1 ♂, Pollardstown Fen, emergence trap, 25.vii.2001; 2 ♂, Killaun Bog (one in water trap, one in Malaise trap). This species was described from Britain as *T. disneyi* Withers in 1997. It has since become clear that this is a synonym of *anchoriformis*, as proposed (but only on the basis of a comparison of the respective figures) by Ježek (1999). The precise ecological requirements of this species are difficult to guess: although *T. pulchra* (Eaton) is seemingly a prominent associate of tufa at Pollardstown, where dozens of specimens have been seen in emergence traps, *anchoriformis* is much less numerous and not present in the same areas.

Scatopsidae

*Thripomorpha cooki* Hutson

1 ♂, Pollardstown Fen, emergence trap, 12.vii.2002.

## **Empididae**

*Heimerodromia adulatoria* Collin

KERRY: Urragh Wood, Kenmare (V8363), 1 ♂, 1 ♀, 8.vii.1990, *Quercus* woodland.

*Heimerodromia* are small pale empids, often overlooked in the net. Collin (1961) recorded this species from Scotland.

*Rhamphomyia (R.) tibialis* Meigen

WICKLOW: River Dargle (O2316), 1 ♂, 7.v.89, damp woodland.

This species is readily identifiable from Collin (1961) who recorded this species from Invernesshire and Lanarkshire in Scotland, and 4 counties in England.

## **Dolichopodidae**

[*Dolichopus plumipes* (Scopoli) var. *pectinitarsis* (Stenhammar)]

LONGFORD: Lough Derragh (N3979), 1 ♂, 15.vii.1990.

Lough Derragh appears to be an exceptional site, at least as judged by the number of unusual or scarce insects captured in one brief visit. A small *Dolichopus* taken by sweeping had for some time been tentatively identified as *medicornis*, although a number of features suggested otherwise. By using Parent (1938) the species readily fell out at *pectinitarsis*, which is recorded from France, Sweden and Prussia. However, Ringdahl (1949) indicated that a number of supposedly rare dolichopodids were "gynandromorphic forms". The teratology of these formations is unclear, but they are more likely to be intersexes, as they show intermediate features. Both *D. pectinitarsis* and *D. parvicaudatus* Zetterstedt are stated by Ringdahl to be intersexes of the more common *D. plumipes* (Scopoli). The Palaearctic Catalogue did not take these synonymies into account and Grichanov (2002) preferred to retain *pectinitarsis* as a separate species until a revision of the genus is carried out, but he also suggested that *Dolichopus polleti* Meuffels & Grootaert (1989) might be the same species. Pending resolution of the status of *pectinitarsis*, it is here referred to as a variety of *D. plumipes*].

*Sympycnus aeneicoxa* (Meigen)

WICKLOW: Black Ditch Wood, Murrough (O3003), 1 ♀, 8.v.1989, swept in flooded woodland. Although Assis-Fonseca (1978) recorded this species as widespread, it is apparently hitherto unrecorded from Ireland.

*Thrypticus nigricauda* Wood

LONGFORD: Lough Derragh (N3979), 1 ♂, 15.vii.1990.

These very small flies are scarce in general collecting, perhaps requiring a different strategy from sweeping. Assis-Fonseca (1978) recorded this species from only two localities in England, the most recent being in 1912.

## **Phoridae**

All the species detailed below belong in the giant genus *Megaselia*, a difficult group to work on. When in doubt (as I frequently was) I was fortunate to be able to persuade the world expert to look at the more troublesome specimens, all of which were captured in Killaun Bog.

*Megaselia angusta* (Wood)

11 ♂, water traps in various locations. A recent revision of *Megaselia* species related to *pulicaria* (Fallén) (Disney 1999) led to the reinstatement of *angusta* as a valid species, with the comment "the majority of published records of *M. pulicaria* refer to this species". Thus it is the name, rather than the species, which is new to Ireland. A species very prone to capture by emergence traps, it has been recorded (among other things) as a parasite of spider egg sacs.

*M. bifida* Disney

2 ♂, water trap.

*M. oviarunae* Disney

1 ♂, water trap. Another species which parasitises spider egg sacs.

*M. tonyirwini* Disney

1 ♂, water trap.

### **Carnidae**

*Meoneura flavifacies* Collin

OFFALY: Killaun Bog, ix.2000.

### **Canacidae**

*Xanthocanace ranula* (Loew)

CORK: Clonpriest (X0573), 13.vii.1994.

### **Sphaeroceridae**

*Minilimosina (Allolimosina) albinervis* (Duda)

1 ♂, Killaun Bog, Malaise trap. A very rare species for which only three specimens were known to Pitkin (1988).

*Minilimosina gemella* Roháček

2 ♂, Pollardstown Fen, emergence trap 27.vi.2002. Roháček's supposition that this species had an exclusively upland distribution has already been challenged by my finding of it in pitfall traps in Norfolk (Withers 1989). Clearly rare, this represents another lowland locality.

*Phthitia (Kiniosina) plumosula* (Rondani)

1 ♂, Pollardstown Fen, emergence trap, tufa spring, 19.vi.2001. The identity of this specimen was checked by reference to Roháček (1985) as the illustrations in Pitkin (1988) are incomplete. Roháček stated that this is an uncommon species of damp areas, but which may be found throughout the year.

*Telomerina pseudoleucoptera* (Duda)

1 ♂, Pollardstown fen, emergence trap, 12.vii.2002: 1 ♂, Killaun Bog, water trap.

*Terrilimosina schmitzi* (Duda)

1 ♂, Pollardstown Fen, Malaise trap, 8-19.viii.1998.

### **Acknowledgements**

The Praeger Committee of the Royal Irish Academy kindly grant-aided a field trip to several localities with the eventual intent of producing an Irish checklist to the sciarids. I would also like to thank the many friends in Ireland who have variously accompanied, assisted or hindered me in my search for small Diptera, leading to this note. In particular I would like to mention the sterling efforts of Grace O'Donovan in sorting catches from traps at Killaun Bog, and Jervis and Fidelma Good for similar efforts at Pollardstown Fen. The hospitality of the latter during my various trips to Ireland is becoming legendary. Without Henry Disney, many phorids would still be *Megaselia* sp., and a similar helping hand was extended by Frank Menzel for the sciarids. Peter Dyte provided the important information on the status of *Dolichopus pectinitarsis*.

## References

- Assis-Fonseca, E.C.M. d' 1978. Diptera: Orthorrhapha, Brachycera (Dolichopodidae). *Handbooks for the Identification of British Insects*. Vol. IX, part 5.
- Blackith, R.E. and Blackith, R.M. 1989. Diptera reared from decaying potatoes in Ireland. *Irish Naturalists' Journal* **23**, 71-72.
- Blackith, R.E., Blackith, R.M., Speight, M.C.D. and de Courcy Williams, M. 1991. A first list of Diptera from the Murrough, Co. Wicklow, Ireland, including 663 species and 140 breeding records. *Bulletin of the Irish Biogeographical Society* **14**, 185-253.
- Chandler, P.J. 1998. (Ed.) Checklists of Insects of the British Isles (New Series). Part 1: Diptera (Incorporating a List of Irish Diptera). *Handbooks for the Identification of British Insects* **12**(1), i-xix, 1-234. Royal Entomological Society, London.
- Collin, J.E. 1961. *British Flies. VI: Empididae*. Cambridge University Press.
- Disney, R.H.L. 1999. A troublesome sibling species complex of scuttle flies (Diptera : Phoridae) revisited. *Journal of Natural History* **33**/8, 1159-1216.
- Grichanov, I. 2002. A Check list of Swedish Dolichopodidae (Diptera). *Entomologisk Tidskrift* **123**, 119-130.
- Ježek, J. 1999. Rare and new palaearctic *Tonnoiriella*-species (Diptera, Psychodidae). *Casopis Narodního muzea Rada přírodovědná* **168**(1-4), 7-18.
- Jung, H.F. 1958. 9b. Psychodidae-Trichomyiinae. *Die Fliegen der paläarktischen Region* **3**(1), 1-16.
- Lavery, T.A., Speight, M.C.D and Blackith, R.M. 1993. Records of some Irish dance flies including eleven species new to Ireland and a checklist of the Irish fauna (Diptera: Empididae, Hybotidae, Microphoridae) *Irish Naturalists' Journal*, **24**, 204-212.
- Menzel, F. and Mohrig, W. 1997. Revision der paläarktischen Arten von *Trichosia* Winnertz sensu Tuomikoski, 1960 (Diptera, Sciaridae). Teil I. Gattung *Trichosia* Winnertz, 1867. *Studia dipterologica* **4**, 3-40.
- Meuffels, H. and Grootaert, P. 1989. The relatives of *Dolichopus plumipes* (Scopoli, 1763), with the description of a new species from Belgium (Diptera Dolichopodidae). *Bulletin et Annales de la Société Royale entomologique de Belgique* **125**, 83-98.
- O'Connor, J.P. and Ashe, P. 1991. Ten species of Sciaridae (Diptera) New to Ireland. *Dipterists Digest (First Series)* **8**, 29-30.
- Parent, O. 1938. Diptères Dolichopodidae. *Faune de France* **35**, 1-72.
- Pitkin, B. 1988. Lesser Dung Flies. Diptera: Sphaeroceridae. *Handbooks for the Identification of British Insects*. Vol X, part 5c.
- Ringdahl, O. 1949. Notizen zur Familie Dolichopodidae (Diptera). *Opuscula Entomologica* **14**, 53-59.
- Roháček, J. 1985. A monograph and re-classification of the previous genus *Limosina* Macquart (Diptera, Sphaeroceridae) of Europe. Part IV. *Beiträge zur Entomologie, Berlin* **35**, 101-179.
- Speight, M.C.D and de Courcy Williams, M. 1992. Records of 23 species of Dolichopodidae (Diptera) whose presence in Ireland requires confirmation. *Irish Naturalists' Journal* **24**, 17-20.
- Withers, P. 1989. Some interesting Diptera collected in pitfall traps in Norfolk Breckland. *Dipterists Digest (First Series)* **2**, 7.
- Withers, P. & O'Connor, J.P. 1992. A preliminary account of the Irish species of moth fly (Diptera: Psychodidae). *Proceedings of the Royal Irish Academy* **92B**, 61-77.

***Stenomicroa cogani* Irwin (Diptera, Stenomicroidae).  
A family, genus and species new to Ireland**

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**Summary**

*Stenomicroa cogani* Irwin (Stenomicroidae) is added to the Irish list from Pollardstown Fen, County Kildare.

The Stenomicroidae are orphan acalypterate Diptera, a family of small pale flies, with narrow wings and curious reniform eyes. They were originally included in the Anthomyzidae (as *Diadelops*) and then transferred to the Aulacigastridae. They are now placed in their own family. Both the known European species are rarely encountered, as they are secretive inhabitants of tussocks, particularly those of sedges. Invertebrates of this microhabitat require rather different collecting strategies, and the use of suction devices has been demonstrated to produce excellent results in abstracting the fauna of such situations.

A female *Stenomicroa* was collected in Pollardstown Fen, County Kildare (N7715) on 16.vii.1990, using a D-Vac suction trap. The paucity of specimens of either species of *Stenomicroa* has necessitated a delay in establishing the precise identity of this specimen. The generosity of Andrew Godfrey in sending me a female of *S. delicata* (Collin) for comparison has finally enabled me to determine that the female cited above is *cogani* Irwin. The original description (Irwin 1982) was based on males only, although I believe that females have since been collected in Norfolk. The clearest distinction between the two species seems to be that the occiput and thorax of *delicata* are grey dusted, whilst the same areas of *cogani* are shining yellow. The specimen is in the author's collection.

Andersson (1991) recorded *S. cogani* from Sweden, the only other published record of which I am aware. *S. delicata* is known only from Great Britain and Czechoslovakia. It is eminently possible that this species also occurs in Ireland, and should be sought in the same situation as that reported for *cogani*.

**Acknowledgements**

My best thanks are due to Dr. Jervis Good who operated the D-Vac at Pollardstown Fen, enabling a number of interesting tussock invertebrates to be collected. I carried it, but only he could make it work. Andy Godfrey kindly gave me a female *delicata* for comparison, without which my specimen would still be lingering in the limbo of the *sub-judice* box, and also provided a copy of Andersson's paper.

**References**

- Andersson, H. 1991. Dvärgfluer, Stenomicroidae, en för Norden ny flugfamilj (Diptera). *Entomologisk Tidskrift* **112**, 149-151.  
Irwin, A. 1982. A new species of *Stenomicroa* Coquillett (Diptera, Aulacigastridae) from Anglesey, North Wales. *Entomologist's monthly Magazine* **118**, 235-238.

## Diptera new to Ireland in seventeen families

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### Summary

Eighty species of Diptera are newly recorded for Ireland in the families Sciaridae, Psychodidae, Hybotidae, Platypodidae, Lonchoceridae, Pipunculidae, Piophilidae, Lauxaniidae, Chamaemyiidae, Sepsidae, Agromyzidae, Opomyzidae, Tethinidae, Heleomyzidae, Drosophilidae, Ephydriidae and Scathophagidae; this is one of a series of papers updating the Irish Diptera list preliminary to the preparation of a revised checklist of Irish Diptera. The following two species are deleted from the Irish list: *Bradysia aprica* (Winnertz) (Sciaridae), *Norellisoma lituratum* (Wiedemann in Meigen) (Scathophagidae), *Phytoliriomyza pteridii* Spencer (Agromyzidae), *Norellisoma opacum* (Loew) (Scathophagidae) and *Helina maculipennis* (Zetterstedt) (Muscidae) are reinstated to the Irish list. Lectotypes are designated for *Pericoma ustulata* Haliday in Walker and *Trichomyia urbana* Haliday in Walker (Psychodidae). Three species of Sciaridae (*Bradysia leptoptera* Tuomikoski, 1960; *B. nocturna* Tuomikoski, 1960; *Leptosciarella cerifera* Mohrig & Menzel, 1997) are newly recorded for the British Isles. *Leptosciarella subspinulosa* (Edwards) (Sciaridae) is restored to specific rank from synonymy under *L. pilosa* (Staeger); Irish and British records are presented for both species.

### Introduction

At present, the first three authors are involved in compiling a revised checklist of the Irish Diptera. As part of this research, the senior author has been identifying undetermined specimens collected during recent years and a number of species new to Ireland have been discovered. Some of these are reported here and the opportunity is also taken to include other species in the same families of which Irish records had previously been known but as yet unpublished. Under Sciaridae, where the last mentioned author has recorded the same species (see Withers 2002), his data are included in the present paper for convenience, as are his records of Pipunculidae.

In the recent British checklist (Chandler 1998) the symbol + indicated occurrence in Ireland against all species of which Irish records had been published, but it was stated that there are also previously known Irish records awaiting publication in many families of Diptera. It was intended to publish these additional species in a series of papers, of which this is one, so that the planned Irish checklist can be as complete as practicable. Families and species here follow the order of the 1998 checklist.

Data for the species new to Ireland are listed below; the abbreviations of collectors' names are those of the authors and the following: AHH = A.H. Haliday, AWS = A.W. Steffox, CED = C.E. Dyte, CR = C. Reid, HWA = H.W. Andrews, MAOC = M.A. O'Connor, MB = M. Boston, MGM = M.G. Morris, PW = P. Withers, REB = R.E. Blackith, RMB = R.M. Blackith, TJJ = T.J. Jordan, WR = W. Ruttledge; NMD = National Museum of Ireland, Dublin, given in text where no collector's name is on the specimen, most such material probably collected by J.N. Halbert.

Material collected by AHH, JPOC, MAOC, REB, RMB and WR is deposited in NMD; that collected by AGI, CR, RN and TJJ is in the Ulster Museum, Belfast, by AWS in the Smithsonian Institution, Washington D.C. and by HWA in the collections of the British Entomological and Natural History Society at Dinton Pastures. Some of the material from other collectors has also been deposited in NMD.

## Sciaridae

The Sciaridae of the British Isles are currently being actively studied with the intention of producing a revised handbook, under preparation by Jane Smith (HRI, Wellesbourne, UK) and Frank Menzel (Eberswalde, Germany). Many additional species are being recognised in Britain and some of these have also been found in Ireland. The Irish fauna of Sciaridae has been particularly poorly known, only 35 species being listed by Chandler (1998), increased to 52 by Withers (2002) and to 70 in the present paper. As the Irish record of *Bradysia aprica* (Winnertz) was corrected to *B. nitidicollis* (Meigen) by Chandler *et al.* (1996) a + should have appeared against *nitidicollis* rather than *aprica* in the checklist. The + against *Bradysia rufescens* (Zetterstedt) in the checklist was based on the record of *pullula* (Winnertz) by Blackith *et al.* (1991), which requires re-assessment now that other species identified as *pullula* by Freeman (1983) are known to occur in Ireland. All records cited here for this family are based on males.

### *Bradysia fungicola* (Winnertz)

The records of *B. fungicola* from Ireland by O'Connor and Ashe (1991) and Chandler *et al.* (1996) related to *B. pectoralis* and it is also apparent that *fungicola* sensu Freeman (1983) was *pectoralis*, which is a common species in Britain. However, true *fungicola* is also common in Britain and can now be confirmed to occur in Ireland.

KERRY: Muckross, Monk's Wood, 4.v.1981, PJC.

### *Bradysia leptoptera* Tuomikoski

This is one of several species confused under the name *pullula* (Winnertz) by Freeman (1983), which have similar genitalia but are assigned to either the *angustipennis* or *rufescens* groups by Menzel and Mohrig (2000) on a combination of other characters. It is widespread in Britain.

ANTRIM: Lennymore Bog (J1175), 22.iv.1976. CR: CLARE: near Ailladie (M0802), 24.v.1985, JPOC and MAOC.

### *Bradysia nocturna* Tuomikoski

This species was confused with *B. brunnipes* in British collections and by Freeman (1983). It is commoner than *brunnipes* in British material examined. The Irish records given under *brunnipes* by Chandler *et al.* (1996) included both species, the record from ANTRIM, Glenariff relating to *B. nocturna*. Further Irish records of *B. nocturna* are cited below.

WATERFORD: Mahon Falls (S3009), 3.vii.1988, JPOC; WEXFORD: Ballyteige (S9504), 3.vi.1987, JPOC.

### *Bradysia pectoralis* (Staeger)

See comments under *B. fungicola* above. Additional records of *pectoralis* are provided here.

CLARE: Ballynalacken Castle, 19.v.1970, PJC; CORK: Glengarriff Forest (V9157), 4.vii.1985, JPOC and MAOC; DUBLIN: by River Liffey at Strawberry Beds (O0635), 20.ix.1999, PJC; KERRY: Killarney, Tomies Wood (V9188), 15.ix.1987, JPOC; Dromore Forest, 15.x.1973, PJC; OFFALY: Charleville Wood (N3222), 27.v.1984, PJC, 15.vi.1985, PW, 19.ix.1989, PJC; ROSCOMMON: Castlereagh, 28.ix.1977, PJC; SLIGO: Templehouse Demesne, 1.x.1979, PJC; Beltra Lough, 13.vi.1985, PJC; WESTMEATH: Lough Slewin, 28.vi.1987, PJC; WEXFORD: Oaklands (S7125), 29.v.1987, JPOC; WICKLOW: Glen of the Downs (O2611), 27.viii.1987, JPOC.

### *Bradysia vagans* (Winnertz)

This was added to the British list in the checklist and is another of the species confused under the name *pullula* (Winnertz) by Freeman (1983). It is common in Britain.



CLARE: near Fanoré (M1307), green road in Burren, 24.v.1985, JPOC and MAOC; DOWN: Hollywood, 18.vi.1993, TJJ; WICKLOW: Knocksink Wood (O2118), 28.ix.1999, PJC.

*Corynoptera abblanda* Freeman

CLARE: Lisdoonvarna Spa (R1397), 21.iv.1982, JPOC and MAOC; WEXFORD: J.F. Kennedy Park (S7319), 29.iii.1989, JPOC and MAOC.

*Corynoptera blanda* (Winnertz)

DUBLIN: Slade of Saggart (O0324), 26.ix.1999, PJC

*Corynoptera flavicauda* (Zetterstedt)

CAVAN: Virginia Woods (N5987), 21.v.1989, JPOC; CORK: Gearagh (W2969), 9.vii.1990, PW; KILKENNY: Ballykeeffe Wood, 29.vi.1987, PJC; Castlecomer, 25.vi.1987, PJC; OFFALY: Charleville Wood (N3223), 15.vi.1985, PW; WICKLOW: Knocksink Wood (O2217), 17.vi.1985, PW.

*Cratyna (Spathobdella) colei* (Freeman)

KERRY: Killarney, Kenmare Estate (V9490), 8.ix.1987, JPOC and MAOC.

*Leptosciarella cerifera* Mohrig & Menzel

This species, not previously recorded from the British Isles, is easily confused with *L. rejecta* but has distinctly longer male antennae. It has also been examined from sites in Wales, Gloucestershire and Warwickshire.

KERRY: Dromore Forest, 1♂ 15.x.1973, PJC.

*Leptosciarella pilosa* (Staeger)

Previous records of this species from Ireland (Freeman 1983, Blackith *et al.* 1991, Chandler *et al.* 1996) are incorrect and refer mainly to *L. rejecta* (Winnertz), which was misidentified as *L. pilosa* by Freeman (1983); of the specimens cited by Chandler *et al.* those from Ennis and Glendalough were *L. rejecta* while that from Knocknarea was *L. melanoma* (Mohrig & Menzel), already recorded from Ireland by Mohrig and Menzel (1997). The records cited below from Ireland and Scotland are of true *pilosa* as described and figured by Mohrig and Menzel (1997). However, the synonymy of *subspinulosa* Edwards with *pilosa*, proposed in that paper, has been found to be incorrect (see below).

CORK: Gearagh (W2969) 9.vii.1990, PW; DUBLIN: Phoenix Park, 2♂ reared from rot hole in beech *Fagus*, debris collected 3.vii.1999, emerged 24.viii.1999, CED; OFFALY: Charleville Wood (N3223) 15.vi.1985, PW.

British material of *pilosa*: SCOTLAND: Ross: Tarradale House (NH5548), Malaise trap, 1♂ v. 2002.

*Leptosciarella scutellata* (Staeger)

This species was recorded from Britain in earlier lists as *elegans* (Winnertz) but it was omitted from Freeman (1983), probably due to being confused under his *pilosa* along with *rejecta* and other species. It is a common species in Britain.

KILKENNY: Balliologue, 25.vi.1987, PJC; OFFALY: Charleville Wood (N3222), 27.v.1984, PJC.

*Leptosciarella subspinulosa* (Edwards)

This species was described by Edwards (1925) from two males from the Isle of Arran, Scotland. Although Freeman (1983) stated that he had examined a single male, both specimens are still in

the BMNH collections. The holotype is a pinned specimen in the General (world) collection with the genitalia mounted in Canada balsam, while the paratype (presumably that examined by Freeman) is on a slide. Both specimens agree with the figures by Edwards and Freeman in having a series of minute spinules on the inner face of the gonostylus basad of the apical spine and also (as described by Freeman) have macrotrichia present on vein y but absent from x. These spinules are absent from the gonostylus of *pilosa*, which also has x as well as y completely beset with macrotrichia. One Irish male and several from Scotland have been examined. It is therefore concluded that *subspinulosa* is a good species, which was evidently not present among the material examined by Mohrig and Menzel (1997).

WICKLOW: Devil's Glen, 1♂ 10.vi.1985, PJC.

British material of *subspinulosa*: SCOTLAND: Aberdeenshire: Morrone Birkwood, 1♂ 31.v.1998, PJC; Inverness-shire: Feshie Bridge, 1♂ 20.v.1975, PJC; Ross: Braelangwell, 3♂ 20.v.2002, PJC; Sutherland Migdale Wood, 1♂ 31.v.2002, PJC; WALES: Radnorshire: Cilkenny Dingle, 1♂ 22.v.1977, PJC.

*Lycoriella (Hemineurina) conspicua* (Winnertz)

KILDARE: Straffan (N9326), 1♂ 14.xi.1981, JPOC and MAOC; Rye Water (O0036), 1♂ 9.viii.1981, JPOC and MAOC.

*Lycoriella (Hemineurina) modesta* (Staeger)

KILKENNY: Castlecomer, mixed wood and ponds, 2♂ 25.vi.1987, PJC.

*Scaptosciara atomaria* (Zetterstedt)

CLARE: near Corker Pass (M3010), 23.v.1985, JPOC and MAOC; DUBLIN: Clondalkin (O0631), Malaise trap, 14-16.iii.1982, JPOC and MAOC; WICKLOW: Murrough, Black Ditch Wood (O3103), v.1989, PW.

*Scaptosciara multispina* (Bukowski & Lengersdorf)

WICKLOW: Stepside (O1924), 8.v.1989, PW; Powerscourt, 20.vii.1971, PJC.

*Sciara ulrichi* Menzel & Mohrig

TYRONE: Moy, Malaise trap, 2♂ 24-30.ix.1984, MB.

*Scythropochroa radialis* Lengersdorf

TYRONE: Moy, Malaise trap, 1♂ 24-30.ix.1984, MB.

## Psychodidae

The account of Irish Psychodidae by Withers and O'Connor (1992) referred to type material of species described by A.H. Haliday where relevant, but most of Haliday's material was not revised in that paper and was not among that mentioned as remounted on slides. His material and some other remaining pinned material of this family in NMD has been macerated and mounted in DMHF (dimethyl hydantoin formaldehyde) by the senior author. This has resulted in one addition to the Irish list and a further addition from recent collecting is also reported here. As mentioned by Withers and O'Connor (1992) material from the Rev. E.A. Eaton collection is present at NMD and some of Haliday's specimens bear labels inscribed "fide Eaton" indicating that he had checked their identity. The additional Irish material identified in NMD is listed here.

*Boreochytocerus ocellaris* (Meigen)

In Haliday's collection 1♂ labelled Ireland and 1♂ labelled Belclare (referring to a locality at Holywood, County Down where it was recorded by Haliday 1833).

*Pericoma fuliginosa* (Meigen)

In Haliday's collection 1♂ labelled Ireland and 1♂ labelled as British.

*Pericoma nubila* (Meigen)

MAYO: Hollymount, ♂ 8.iv.1923, WR.

*Pericoma trivialis* Eaton

DONEGAL: Kilmacrenan, ♂ 27.vii.1891; this was evidently the specimen on which the King (1900) record, cited by Withers and O'Connor (1992), was based.

*Psychoda albipennis* Zetterstedt

In Haliday's collection 1♀ staged with 1♀ of *P. phalaenoides*, but without any data.

MAYO: Hollymount, 1♀ 25.iii.1923, WR.

*Psychoda cinerea* Banks

MAYO: Hollymount, 1♀ 25.iii.1923, WR.

*Psychoda phalaenoides* (Linnaeus)

In Haliday's collection 1♂ labelled Ireland.

*Tinearia alternata* (Say)

In Haliday's collection 1♀ labelled Ireland, 1♂ and 1♀ labelled Malahide and 1♀ labelled as British. *Psychoda sexpunctata* Haliday in Curtis is regarded as a synonym of *alternata*.

*Mormia revisenda* (Eaton)

New to Ireland and this is only the second species of *Mormia* to be recorded.

OFFALY: Charleville Wood (N3222), ♂ 19.ix.1999, PJC.

*Panimerus denticulatus* Krek

MEATH: Hayes Island, 1♂ and 1 probable ♀ 11.vi.1921, NMD.

*Paramormia ustulata* (Haliday in Walker)

In Haliday's collection 1♂ and 1 specimen lacking the abdomen, both labelled Ireland, are *ustulata* as currently interpreted. This species was described from Irish material and was said to have been not rare on lake and sea shores, where Haliday had found the pupa in moist sand. The male specimen is here designated lectotype.

*Peripsychoda auriculata* (Haliday in Curtis)

A British specimen from Haliday's collection, labelled as "Type" and "fide Eaton", had previously been slide mounted. In Walker (1856) the name *fusca* Macquart is used for this species, but only recorded from Ireland while *Psychoda auriculata* Haliday in Curtis is wrongly placed as a synonym of *Pericoma palustris* Meigen, also only recorded from Ireland but there is no material under *palustris* in Haliday's collection.

KERRY: Kenmare Demesne, 2♂ 1♀ no other data, NMD.

*Philosepedon humeralis* (Meigen)

*Pericoma bullata* Haliday in Walker is regarded as a synonym of *humeralis* but no material under either name is present in Haliday's collection.

MAYO: Hollymount, ♂ 25.iii.1923, ♀ 6.iv.1923, WR.

*Threticus balkaneolpinus* Krek

In Haliday's collection 2 ♂ (staged together with 1 ♀) labelled Ireland, not previously identified. This species is new to Ireland and is a recent addition to the British list (Withers 1997).

*Threticus lucifugus* (Haliday in Walker)

This species was described from Irish material from Holywood, County Down and Blarney, County Cork, so a male in Haliday's collection labelled British, "fide Eaton" and "*Psychoda lucifuga* Hal." in Eaton's handwriting cannot be a syntype, which is fortunate as it is *Pericoma blandula* Eaton. Haliday's collection included the specimens to Krek. There is no evidence that the specimens of *T. balkaneolpinus* referred to above had previously been identified as *lucifuga* and they too are not considered syntypes. It is therefore concluded that no type material of *Psychoda lucifuga* Haliday in Walker survives and the name should continue to be applied as currently interpreted.

*Sycorax silacea* Haliday in Curtis

In Haliday's collection 1 ♀ labelled Ireland, "fide Eaton" and "TYPE" (handwritten on cardboard). Two other species of *Sycorax* are now known from the British Isles, one of them newly recorded from Ireland by Withers (2002) and females cannot presently be identified, so it is unfortunate that the only surviving syntype of *silacea* is a female. Although it is most likely that this syntype is *silacea* as now interpreted, a lectotype designation is not made to avoid any later nomenclatural problems should identification of females in this genus become practicable.

*Trichomyia urbica* Haliday in Curtis

In Haliday's collection 1 ♀ labelled Ireland and "TYPE" (similar label to *silacea* above). This is *urbica* as currently interpreted and is here designated lectotype. As *T. urbica* is a species associated with decaying trees, the occurrence about sewers mentioned by Walker (1856) seems incongruous and it appears likely that other psychodids that have this habit had later been confused with *urbica*.

**Hybotidae**

*Platypalpus excisus* (Becker)

CLARE: Fanore (M1308), sand dunes, 2 ♂ 26.v.1992. JPOC.

**Platyppezidae**

*Agathomyia woodella* Chandler in Vaňhara

Only two species of the genus *Agathomyia* have previously been recorded from Ireland and this is an interesting record as *A. woodella* is in Britain a very local species found in southern England north to Yorkshire. Its biology remains unknown but it is probably associated with a polypore fungus like other *Agathomyia* species.

WICKLOW: Ballyorney Wood (O222155), 1 ♀ 22.viii.1988, REB and RMB, NMD (in alcohol).

**Lonchopteridae**

Only the two commonest of the seven British species of this family were known to occur in Ireland, so the find reported here is of particular interest.

*Lonchoptera nigrociliata* Duda

KILDARE: Rye Water (O005363), ♀ 9.viii.1981, JPOC and MAOC.

### Pipunculidae

The Irish Pipunculidae are poorly known, with only 20 of the 92 British species cited as Irish in the checklist. All members of the family are considered to be parasitoids of Homoptera but little headway has yet been made in working out their life histories. The adult flies are often elusive in the field and usually found in low numbers, so further additions to the Irish list are likely. Of the species added to the Irish list below, *Cephalops semifumosus* is evidently as common in Ireland as in Britain but no previous published records have been traced.

*Chalarus brevicaudis* Jervis

CORK: Glengarriff (V9256), 6.vii.1985, JPOC and MAOC.

*Chalarus pughii* Coe

CORK: Glengarriff (V9256), 7.vii.1985, JPOC and MAOC; DOWN: Crawfordsburn Country Park, 2.vii.1987, PJC.

*Jassidophaga setosa* (Verrall)

WICKLOW: River Dargle, 7.v.1989, PW.

*Cephalops* (sensu stricto) *vittipes* (Zetterstedt)

WESTMEATH: Lough Ballynafid, carr. 16.vi.1985, PJC.

*Cephalops* (*Parabeckerias*) *obtusinervis* (Zetterstedt)

DOWN: Donard Lough, 13.v.1957, AWS; WICKLOW: Avondale (T1985), 27.v.1988, JPOC; Glendalough, south shore of upper lake, 10.vi.1985, PJC; River Dargle, 7.v.1989, PW.

*Cephalops* (*Semicephalops*) *semifumosus* (Kowarz)

There is a female in Haliday's collection (NMD) labelled Ireland and determined as this species by R.L. Coe.

CAVAN: Woodlawn, Lough Sheelin (N4686), 12.ix.1991, JPOC; DUBLIN: Howth woods, 27.vi.1975, PJC; GALWAY: Rossleague House (L6857), 24.vii.1982, JPOC and MAOC; LAOIS: The Derries (N586050), mixed woodland, 20.ix.1982, JPOC; ROSCOMMON: Castlerea, broadleaved woods, 28.ix.1977, PJC; TIPPERARY: River Shannon (R708727), 4.vii.1981, JPOC and MAOC; WATERFORD: Passage East (S6811), 3.vii.1991, JPOC and MAOC; WEXFORD: Tintern Abbey (S7810), 15.vii.1990, JPOC; WICKLOW: Glendalough, by waterfall, 16.ix.1968, PJC; Glen of the Downs, 18.ix.1968, PJC.

*Cephalosphaera germanica* Aczél

WICKLOW: Glen of the Downs, 6.v.1989, PW.

*Pipunculus hertzogi* Rapp (= *phaeton* Coe)

KILDARE: Newbridge Fen, 16.vii.1990, PW.

*Dorylomorpha* (sensu stricto) *extricata* (Collin)

WEXFORD: Oaklands (S715255), 29.v.1987, JPOC.

*Dorylomorpha* (*Dorylomyza*) *xanthopus* (Thomson)

ANTRIM: Selshan, Lough Neagh, 26.vi.1957, AWS; CLARE: Lough Bunny (R3696), 28.v.1984, JPOC and MAOC; DOWN: Sliderry Pool, 29.vi.1957, AWS; WATERFORD: Ballin Lough (S4403), 18.vi.1990, JPOC and MAOC; WEXFORD: Ballyteige (S9504), sand dunes, 11.vi.1982, JPOC.

### Piophilidae

Stubbs and Chandler (2001) increased the British list of this family to 14 species, of which half are now known from Ireland following the two additions reported here.

#### *Liopiophila varipes* (Meigen)

DONEGAL: Baybeg. ♀ v.1976. RN: KERRY: Castlerosse. ♀ 2.v.1981. PJC.

#### *Prochyliza nigrimana* (Meigen)

DUBLIN: Donabate, grassland above beach. ♀ 17.vii.1971. PJC.

### Lauxaniidae

The Lauxaniidae have not been well studied in Ireland, most published records being old apart from a few recent notes on particular species, although a number of species are very common there. Most species are thought to be saprophagous as larvae on decaying vegetation and few appear to be specialised in their habitats. Only half of the 54 British species were cited as Irish in the checklist, so it is not surprising that several additions can now be made to the Irish list.

The two species queried in the checklist still require confirmation. *Sapromyza apicalis* Loew was recorded by Grimshaw (1912) but specimens under this name in the National Museums of Scotland collection are *S. halidayi* Shatalkin (= *sordida* Haliday). *S. obsoleta* Fallén was recorded by Haliday (1833) but there are no specimens in his collection.

#### *Homoneura tesquae* (Becker)

There is an unlocalised specimen in Haliday's collection.

LAOIS: Emo Park, beaten from ivy *Hedera helix* on wall. ♀ 11.vii.1971. PJC; WEXFORD: Clonmines, amongst ivy on castle by estuary, 2♂ 1♀ 12.vii.1969. PJC.

#### *Cnemacantha muscaria* (Fallén)

CLARE: Burren, Corcomroe Abbey. ♀ 21.v.1970. PJC; Burren, Corker Pass (M3010). ♀ 27.v.1992. JPOC.

#### *Meiosimyza* (= *Lyciella*) *platycephala* (Loew)

CLARE: Lough Derg, wooded shore. 18.v.1970. PJC; DUBLIN: Dublin, 18.viii.1895. NMD; KERRY: Uragh Wood, 8.vii.1990. PW; KILDARE: Newbridge Fen, 14.v.1989. PW; MAYO: Hollymount, 28.ix.1922. WR; WICKLOW: Vale of Clara, vii.1914. NMD; Avondale Forest Park, 10.vi.1985. PJC.

#### *Meiosimyza* (= *Lyciella*) *subfasciata* (Zetterstedt)

KERRY: Uragh Wood, 12.vii.1994. PW; KILKENNY: Castlecomer, 25.vi.1987. PJC; LAOIS: Annaghmore Lough, 26.vi.1987. PJC; SLIGO: Beltra Lough, 13.vi.1985. PJC.

#### *Minettia filia* (Becker) (= *dissimilis* Collin)

KERRY: Caherdean, by River Gweestin, 28.vi.1969. ♂♀ *in copula*. PJC; MAYO: Lough Conn, ♀ 13.vi.1985. PJC; WATERFORD: Stradbally, 10.viii.1906. HWA (abdomen missing); WICKLOW: Devil's Glen, 25.vi.1975. PJC.

#### *Minettia rivos*a (Meigen)

This species is more common in Britain than the allied species *M. fasciata* (Fallén), with which it was confused prior to the revision of the family by Collin (1948), so the records of *fasciata* from Ireland by earlier authors need confirmation. The record of *fasciata* by Andrews (1914) was based on *rivos*a according to a specimen in his collection.

(CORK: Glengarriff (V936560), 1.vii.1985, JPOC and MAOC; DUBLIN: Killiney Bay, 31.vii.1970, CED; Portmarnock, dunes, 26.vi.1975, PJC; WATERFORD: Stradbally, 22.vii.1908, HWA; Passage East (S6811), 13.vi.1990, JPOC; WESTMEATH: Lough Derravaragh (N4762), 30.v.1990, JPOC.

*Poecilolyca vittata* (Walker)

There are three specimens labelled Ireland in the collection of A.H. Haliday as well as the following specimen in NMD.

CLARE: Cratloe, 1895, NMD.

*Sapromyza* (sensu stricto) *albiceps* Fallén

There are three females labelled Ireland as well as the localised specimen mentioned below in the collection of A.H. Haliday in NMD.

DOWN: Clifden, ♂ 6.iii.1840, AHH; MAYO: Louisburgh, hedged track below Old Head, ♀ 13.vi.1985, PJC.

[*Sapromyza* (*Sapromyzosoma*) *quadricincta* Becker

There is a specimen labelled *pallida* in the collection of A.H. Haliday at NMD, but without data so it is not known whether this is of Irish origin.]

**Chamaemyiidae**

The Chamaemyiidae are very poorly known in Ireland, with previous published records of only five species, only one of them in the Leucopinae. Larvae are predators of aphids and scale insects and there is plenty of scope for increasing knowledge of their life histories. Several species of *Chamaemyia* are frequent in grassland and other open habitats so the additions made here are not surprising. The Leucopinae, which are more often associated with trees and shrubs, must be better represented in Ireland than present knowledge indicates. The identity of males of the three species recorded has been confirmed from genitalia characters figured by Collin (1966).

*Chamaemyia aridella* (Fallén)

CLARE: Fanore (M136082), 1.vi.1984, JPOC and MAOC; CORK: Tunnel near Glengarriff (V909598), 10.vii.1985, JPOC and MAOC; Sheep's Head (V731340), 3.vii.1985, JPOC; DUBLIN: Donabate, grassland above beach, 17.vii.1971, PJC; Bull Island, saltmarsh, 12.vii.1971, PJC; MEATH: Batterjohn Big (N8953), 31.v.1989, JPOC; WATERFORD: Tramore (S5901), 14.vii.1989, JPOC and MAOC; WEXFORD: Fethard (S7905), 5.vii.1991, JPOC.

*Chamaemyia juncorum* (Fallén)

CLARE: Burren, Glencolumbkille, 21.vii.1971, MGM; Druid's Altar, 25.vii.1971, MGM; LOUTH: near Flagstaff, marshy field, 15.vii.1977, PJC.

*Chamaemyia polystigma* (Meigen)

CLARE: Cliffs of Moher (R038920), 8.vii.1981, JPOC; WATERFORD: Ballin Lough (S4403), 18.vi.1990, JPOC and MAOC; WEXFORD: Ballyteige (S9504), 2.vi.1991, JPOC; Rosslare Strand (T0917), 15.vi.1991, JPOC.

**Sepsidae**

Although the species recorded here is widespread in Britain there are few recent records. A second species of the genus, *Meroplus fukuharai* (Iwasa) has now been recorded from Britain

by Pont and Meier (2002) and the Irish specimen has been checked against their key.

*Meroplus minutus* (Wiedemann)

WEXFORD: Carnsore Point (T121038). ♀ 1.ix.1980. JPOC.

### **Agromyzidae**

The Irish Agromyzidae were first studied in detail by Griffiths (1968), who recorded 74 species and some further records were given in the handbook by Spencer (1972) and in a few other papers, but the Irish list remained at 95 plus one queried species from a total British Isles fauna of 367 in the checklist (Chandler 1998); there has been a net gain of 5 British species since then, bringing the British list to 369, three species having only been recorded from Ireland. The Irish fauna of this family is expected to be lower than that of Britain because of absence of some host plants but many more species no doubt remain to be recorded and the species added here are all associated with common food plants. It had previously been overlooked that Spencer (1973) cited an Irish record of *Phytoliriomyza pteridii* Spencer and O'Connor (2001) recorded *Agromyza anthracina* Meigen from Ireland; further Irish records of both species are given below. Here the species queried in the checklist, *Napomyza tripolii* Spencer, is confirmed and a further 12 species are added, bringing the Irish list of the family to 110.

*Agromyza anthracina* Meigen (a leaf miner in *Urtica dioica*).

MAYO: Hollymount, indoors. ♂ 18.ix.1922. WR: KERRY: Ross Castle (V950885). ♂ 16.ix.1981. JPOC.

*Agromyza mobilis* Meigen (a miner in Poaceae)

This species was recorded from Ireland by Haliday (1833) but the record was not confirmed by Griffiths (1968).

DOWN: Crawfordsburn Country Park. ♂ 2.vii.1987. PJC; DUBLIN: Howth Woods, ix.1910. NMD; KILKENNY: Castlecomer. ♂ 25.vi.1987. PJC; WEXFORD: near Broadway (T1009). ♂ 5.ix.1980. JPOC; WICKLOW: Avondale (T1985). ♀ 27.v.1988. JPOC; near Aughrim River. ♂ 16.ix.1968. PJC; Glendalough. ♂ 10.vi.1985. PJC.

*Melanagromyza aenea* (Meigen) (a stem borer in *Urtica dioica*)

This too was recorded by Haliday (1833), but Griffiths (1968) found only *M. aeneoventris* (Fallén) in Haliday's collection.

KILDARE: Newbridge Fen, hedge at edge of site. ♂ 27.v.1984. PJC.

*Aulagromyza orphana* (Hendel) (forms an external stem mine in *Galium aparine*)

WICKLOW: Glendalough, north shore of Upper Lake. ♀ 10.vi.1985. PJC; OFFALY: Charleville Wood (N3222) ♀ 27.v.1984. PJC.

*Aulagromyza trivittata* (Loew) (a stem borer in *Galium mollugo*)

DUBLIN: Strawberry Fields, by River Liffey (O0635). ♂ 26.ix.1999. PJC.

*Cerodontha* (*Butomomyza*) *scutellaris* (von Roser) (probably associated with *Carex*)

Cole (1998) recently added this species to the British list from Norfolk.

WESTMEATH: Lough Slevin, birch and alderwood. ♂ 25.vi.1987. PJC.

*Cerodontha* (*Dizygomyza*) *morosa* (Meigen) (develops in *Carex* species)

This was added to the British list in the checklist on the authority of David Henshaw and details of British records have not yet been published.



KERRY: Killarney, beside Cloghereen stream (V977867), 2♂ 10.ix.1981, JPOC.

*Cerodontha (Poemyza) imbuta* (Meigen) (in Poaceae, especially *Deschampsia caespitosa*)  
CORK: Glengarriff (V907575), ♂ 6.vii.1985, JPOC and MAOC.

*Cerodontha (Xenophytomyza) atronitens* (Hendel) (associated with Poaceae)

According to Spencer (1990) the grass associations of the three *Xenophytomyza* species were known, but yet to be published; he described *atronitens* as common in meadows.

CORK: Bantry House (V985481), ♂ 3.vii.1985, JPOC; Glengarriff (V907575), ♂ 6.vi.1985, JPOC and MAOC; DUBLIN: Portmarnock dunes, ♂ 26.vi.1975, PJC; LAOIS: near Annaghmore Lough, scrubby bog, ♂ 26.vi.1987, PJC.

*Liriomyza eupatorii* (Kaltenbach) (a leaf miner in *Eupatorium*, but recorded from other Asteraceae including *Aster*, *Helianthus* and *Lapsana*, and also regular in one species of Lamiaceae *Galeopsis tetrahit*; Spencer 1976, 1990)

CLARE: near Formoyle, green road in Burren (M161066), ♂ 22.v.1985, JPOC and MAOC; OFFALY: Pallas Lough, marsh, 2♂ 27.vi.1987, PJC.

*Liriomyza pusio* (Meigen) (develops in Poaceae)

WEXFORD: Curracloe (T1127), ♂ 13.vi.1991, JPOC and MAOC.

*Napomyza tripolii* Spencer (a stem borer in *Aster tripolium*)

This was queried in the checklist because Griffiths (1968) referred to a female in Haliday's collection as "almost certainly referable to this species".

LOUTH: Blackrock, saltmarsh, 1♂, 1♀ 16.vii.1971, PJC.

*Phytoliriomyza pteridii* Spencer (a miner in ferns including *Pteridium aquilinum*)

This species should have been marked + in the checklist as Spencer (1973) included an Irish specimen, from MAYO, Clare Island in the type series, but this specimen from the National Museums of Scotland collection was evidently assumed by him to be Scottish. It had previously been confused with *P. hilarella* (Zetterstedt) and the Bonhill record given by Spencer (1972) was based on *pteridii*, although both species were confirmed to occur in England. The Irish record of *P. hilarella* by Griffiths (1968), repeated by Spencer (1972), was not mentioned by Spencer (1973) and the occurrence in Ireland of *P. hilarella* thus requires confirmation.

CORK: Glengarriff, *Quercus* wood (V920565), ♂ 6.vii.1985, ♂ 7.vii.1985, JPOC and MAOC.

*Phytomyza solidaginis* Hendel (forms a conspicuous white leaf mine in *Solidago virgaurea*, also in *Bellis* according to Spencer 1990)

CLARE: Burren, north of Kilfenora, low scrub, ♂ 21.v.1970, PJC.

*Phytomyza wahlgreni* Rydén (mines in the midrib of *Taraxacum* species)

DUBLIN: Dublin City Botanic Gardens (O1437), ♂ 13.v.1982, JPOC; KERRY: Muckross, Killarney (V952862), ♀ 11.ix.1981, JPOC; near Kenmare, ♂ 15.x.1973, PJC; Muckross Abbey Woods, ♀ 16.x.1973, PJC; WEXFORD: Nethertown (T1204), ♂ 2.vi.1987, JPOC; Ballyteige (S9504), 3.vi.1987, JPOC.

## Opomyzidae

*Geomyza balachowskyi* Mesnil

This species was till recently confused with *G. hackmani* Nartshuk but can be recognised from the genitalia figures given by Drake (1993). Records are based on males.

CLARE: Black Head (M153722), 2.viii.1988, JPOC and MAOC; KERRY: Kenmare Demesne, Killarney, ix.1937, NMD; Killarney, Flesk, ix.1937, NMD; WATERFORD: Ballin Lough (S4403), 19.vi.1991, JPOC; WICKLOW: wood near Aughrim River, 16.ix.1968, PJC; wood near Blessington, 17.ix.1968, PJC.

### **Tethinidae**

*Pelomyiella mallochi* (Sturtevant)

DUBLIN: Donabate, grassland above beach, 1♂ 1♀ 17.vii.1971, PJC.

### **Heleomyzidae**

This is another family that has received little attention in Ireland except for the revision of *Suillia* by Withers (1987), where 13 of the 18 British species of this mainly fungus feeding genus were recorded from Ireland. Most other members of the family are associated with the nests of birds and mammals and there are only scattered literature records from Ireland for 11 species in other genera. Unlocalised specimens labelled Ireland of six further species are present in the A.H. Haliday collection (NMD) and new records of four of these and five other species are presented here, so that 35 of the 62 British species can now be recorded from Ireland.

*Gymnomus caesus* (Meigen)

ANTRIM: Glenariff, ♂ 12.xi.1986, PJC; WICKLOW: Enniskerry, ♂ bearing numerous pink mites on its abdomen, 10.xi.1986, PJC; Glendalough, 1♀ 13.xi.1984, 2♂ 10.xi.1986, PJC.

*Morpholeria ruficornis* (Meigen)

There is one specimen labelled Ireland in Haliday's collection.

KILDARE: Ardscull Mote, 18.x.1973, PJC; WICKLOW: near Rathdrum, 10.xi.1986, PJC.

*Neoleria maritima* (Villeneuve)

DUBLIN: Dublin, 1.ix.1895, NMD; Bull Island (O2438), alder *Alnus glutinosa* marsh, 14.ix.1985, JPOC; KERRY: Rossbehy (V647922), 12.ix.1981, JPOC; WEXFORD: Tinnacree, sand dunes, 14.ix.1968, PJC; WICKLOW: Kilcoole, grassland above beach, 18.ix.1968, PJC.

*Neoleria ruficauda* (Zetterstedt)

There is a specimen labelled Ireland in Haliday's collection; it had been determined as *inscripta* (Meigen) by A.H. Haliday but had been corrected by J.E. Collin.

OFFALY: Charleville Wood (N3222), 1.v.1987, PJC.

*Neoleria ruficeps* (Zetterstedt)

There are two specimens labelled Ireland in Haliday's collection.

DUBLIN: Clondalkin (O065310), Malaise trap, 1♂ 16-29.iii.1982, JPOC and MAOC.

*Scolioecentra* (sensu stricto) *villosa* (Meigen)

DOWN: Ballywalter, 18.vii.1966, AGI; KERRY: Cloghereen Pool Wood, 8.v.1981, PJC; TYRONE: Gortin Glen, 8.v.1970, PJC.

*Eccoptomera obscura* (Meigen)

WICKLOW: Avondale Forest Park, 4.x.1980, PJC; Glendalough, 13.xi.1984, PJC.

*Oecotheta fenestralis* (Fallén)

There are four specimens labelled Ireland in Haliday's collection.

*Tephrochlaena halterata* (Meigen)

One example labelled Ireland and two labelled Portmarnock are present in Haliday's collection. ANTRIM: Glenariff, 12.xi.1986, PJC; DUBLIN: Portmarnock, sycamore *Acer pseudoplatanus* scrub, 17.xi.1984, PJC; KERRY: Curraheen Strand, Banna, 13.vi.1990, PW.

*Tephrochlamys flavipes* (Zetterstedt)

There are two specimens labelled Ireland in Haliday's collection.

DUBLIN: Malahide Castle, 17.vi.1989, PJC; KERRY: Ross Island, 7.v.1981, PJC; KILKENNY: Ballykeeffe, 25.vi.1987, PJC; MAYO: Hollymount, 20.ix.1922, 28.ix.1922, 7.x.1922, WR; TYRONE: Dunmany Forest, 2.x.1971, PJC; WICKLOW: Killakee, beechwood, 8.v.1988, PJC; Glendalough (T112964), 8.xi.1987, JPOC; Glendalough, 20.ix.1968, 10.xi.1986, PJC; near Rathdrum, 10.xi.1986, PJC; Avondale Forest Park, 4.x.1980, PJC.

*Trioxscelis frontalis* (Fallén)

WICKLOW: marsh and carr below Great Sugar Loaf, ♀ 26.v.1981, PJC.

**Drosophilidae**

Although less than half of the British species of Drosophilidae have been recorded from Ireland, the position is a little better for the genus *Drosophila* itself where 19 of the 34 species on the British list have been recorded previously and a further three are added here. As five of the *Drosophila* species on the British list are occasional recent introductions only seven *Drosophila* species established in Britain remain unrecorded in Ireland.

*Drosophila* (sensu stricto) *limbata* von Roser

CLARE: Lough Bunny (R3696), ♀ 21.v.1985, JPOC and MAOC; MAYO: Westport Demesne, ♂ 29.ix.1977, PJC.

*Drosophila* (sensu stricto) *picta* Zetterstedt

WEXFORD: Nethertown (T125050), *Salix* marsh, 1 ♀ 6.vi.1986, JPOC and MAOC.

*Drosophila* (*Lordiphosa*) *fenestrarum* Fallén

CLARE: near Ennis (R292796), mixed wood mainly hazel *Corylus avellana*, 30.v.1984, JPOC; CORK: Glengarriff (V907575), 6.vii.1985, JPOC; DUBLIN: Gollierstown, 28.vii.1952, AWS; Howth woods, 17.vii.1971, PJC; GALWAY: Coole Park, 21.v.1970, PJC; MAYO: Hollymount, ix.1922, WR; TIPPERARY: near Ballina (R710725), mixed woodland, 20.v.1985, JPOC and MAOC; WEXFORD: Oaklands (S715255), 29.v.1987, JPOC; WICKLOW: Woodend, 24.ix.1949, AWS.

**Ephydriidae**

An Irish list was provided by de Courcy Williams (1989), but this family has otherwise received little attention in Ireland since the work of A.H. Haliday in the 19th century. The type material of species described by Haliday was discussed by de Courcy Williams and O'Connor (1989). Material of *Notiphila* recorded here was determined using Drake (2001). As *N. graecula* was till recently confused with *N. cinerea*, confirmed Irish records of *cinerea* are also listed.

*Coenia curvicauda* (Meigen)

WICKLOW: Russellstown Park (N964109), 2♂ 1♀ 16.viii.1981, JPOC and MAOC; KILDARE: Louisa Bridge (N9936), ♀ 10.iv.1989, JPOC.

*Linnellia surturi* Andersson

CARLOW: Altamont Gardens (S8665), ♀ 31.iii.1991, JPOC.

*Notiphila* (sensu stricto) *dorsata* Stenhammar

WATERFORD: Ballin Lough (S4403), ♂ 19.vi.1991, JPOC.

*Notiphila* (sensu stricto) *gracula* Becker

WEXFORD: Lady's Island Lake (T104071), ♂ 28.vii.1980, JPOC; Carnsore Point (T121038), 27.viii.1980, 3♂ JPOC; The Raven (T110260), ♂ 4.vi.1986, JPOC.

*Notiphila* (sensu stricto) *cinerea* Fallén

CLARE: Burren, Grogan Castle (M2003), 2.vi.1992, JPOC; KERRY: Killarney, Golf Course (V9291), 15.ix.1981, JPOC; KILDARE: Rye Water (O005363), ♂ 9.viii.1981, JPOC and MAOC; WICKLOW: Russellstown Park (N964109), ♂ 16.viii.1981, JPOC and MAOC.

### Scathophagidae

This family has been fairly well worked in Ireland and the first species added here was a noted omission, but as it is closely associated with water lilies *Nuphar* and *Nymphaea*, in which it develops, it is elusive and not easily recorded by non-amphibious dipterists. The identity of the Irish records of a second species has to be corrected.

*Hydromyza livens* (Fabricius)

CAVAN: lake at Bellanagh (N409001), ♂ 3.viii.1981, JPOC and MAOC.

*Norellisoma opacum* (Loew)

The + against *N. lituratum* (Wiedemann) in the checklist should be transferred to this species, to which the records by Chandler (1974) and Irwin (1975) have now been found to refer. *N. opacum* is the species referred to as *flavicornis* (Meigen) by Collin (1958) and the use of the name *lituratum* by Irwin (1975) arose because it was then known that *flavicornis* was to be listed as a synonym of *lituratum* in the then forthcoming checklist (Kloet and Hincks 1976).

ANTRIM: Lough Neagh, Massereene (J1485), ♀ 27.v.1973, 2♂ 1♀ 17.iv.1974, AGI; SLIGO: Glencar Waterfall, ♀ 15.v.1970, PJC; WESTMEATH: Lough Ballynafid, ♂ 7.v.1985, PJC.

### Muscidae

*Helina maculipennis* (Zetterstedt)

A + should have appeared against this species in the checklist as it was correctly recorded from Ireland by Nash and Chandler (1978). Further Irish records are given here.

CLARE: Lough Luogh (R058936), 31.v.1984, JPOC; WEXFORD: Nethertown (T125050), 6.vi.1981, JPOC and MAOC.

### Acknowledgements

We are indebted to all those whose records have contributed to increasing knowledge of Irish Diptera. Assistance with identification has kindly been given by Frank Menzel (Sciaridae) and David Gibbs (Pipunculidae).

### References

- Blackith, R.E., Blackith, R.M., Speight, M.C.D. and de Courcy Williams, M. 1991. A first list of Diptera from the Murrough, Co. Wicklow, Ireland, including 663 species and 140 breeding records. *Bulletin of the Irish Biogeographical Society* 14, 185-253.  
Chandler, P.J. 1974. Dung flies and their allies in Ireland (Diptera, Scatophagidae). *Irish*

*Naturalists Journal* **18**, 109-114.

- Chandler, P.J. 1998. (Ed.) Checklists of Insects of the British Isles (New Series). Part 1: Diptera (Incorporating a List of Irish Diptera). *Handbooks for the Identification of British Insects* **12**(1), i-xix, 1-234. Royal Entomological Society, London.
- Chandler, P., O'Connor, J.P. and Ashe, P. 1996. Notes on the Irish Sciaridae (Diptera), including five species new to Ireland. *Irish Naturalists' Journal* **25**, 258-259.
- Cole, J. 1998. Four species of Agromyzidae (Diptera) new to the British fauna. *Entomologist's monthly Magazine* **134**, 84.
- Collin, J.E. 1948. A short synopsis of the British Sapromyzidae (Diptera). *Transactions of the Royal entomological Society of London* **99**, 225-242.
- Collin, J.E. 1958. A short synopsis of the British Scatophagidae (Diptera). *Transactions of the Society for British Entomology* **13**, 37-56.
- Collin, J.E. 1966. The British species of *Chamaemyia* Mg. (*Ochthiphila* Flin.) (Diptera). *Transactions of the Society for British Entomology* **17**, 121-128.
- De Courcy Williams, M. 1989. A list of Irish Ephydriidae (Diptera) based on the Haliday collection in the National Museum of Ireland. *Irish Naturalists' Journal* **23**, 6-11.
- De Courcy Williams, M. and O'Connor, J.P. 1989. The Ephydriidae (Diptera) relating to species descriptions by A.H. Haliday (1806-70) in the National Museum of Ireland, with notes on the collection. *Proceedings of the Royal Irish Academy* (B) **89**(5), 59-70.
- Drake, M. 1993. A review of the British Opomyzidae (Diptera). *British Journal of Entomology and Natural History* **5**, 143-153.
- Drake, C.M. 2001. The British species of *Notiphila* Fallén (Diptera, Ephydriidae), with the description of a new species. *Dipterists Digest (Second Series)* **8**, 91-125.
- Edwards, F.W. 1925. British Fungus Gnats (Diptera, Mycetophilidae). With a revised Generic Classification of the Family. *Transactions of the Royal entomological Society of London* **1924**, 505-670.
- Freeman, P. 1983. Sciarid flies. Diptera, Sciaridae. *Handbooks for the Identification of British Insects* **9**(6), 1-68. Royal Entomological Society, London.
- Griffiths, G.C.D. 1968. Agromyzidae (Diptera) from Ireland. *Proceedings of the Royal Irish Academy* (B) **67**(2), 37-61.
- Haliday, A.H. 1833. Catalogue of Diptera occurring about Holywood in Downshire. *Entomologist's Magazine* **1**, 147-180.
- Irwin, A.G. 1975. Recent records of dung flies (Diptera, Scathophagidae) from Northern Ireland. *Irish Naturalists Journal* **18**, 188-189.
- King, J.J.F.X. 1900. A few localities for certain Psychodidae collected in England (Wicken Fen, Chippenham Fen), Scotland (Aviemore and Guisachan, Inverness-shire) and Ireland (Kilmacrenan, Donegal). *Entomologist's monthly Magazine* **36**, 135-136.
- Kloet, G.S. and Hincks, W.D. 1976. A check list of British insects. Second edition (completely revised). Part 5: Diptera and Siphonaptera. *Handbooks for the Identification of British Insects* **11**(5), 1-139. Royal Entomological Society of London.
- Menzel, F. and Mohrig, W. 2000. Revision der paläarktischen Trauermücken (Diptera: Sciaridae). *Studia dipterologica Supplement* **6**, 1-761.
- Mohrig, W. and Menzel, F. 1997. Revision der paläarktischen Arten von *Trichosia* Winnertz sensu Tuomikoski, 1960 (Diptera, Sciaridae). -- Teil II. Gattungen *Leptosciarella* Tuomikoski, 1960 und *Trichodapus* gen. nov. *Studia dipterologica* **4**(1), 41-98.
- Nash, R. and Chandler, P.J. 1978. The Irish species of two-winged flies (Diptera) belonging to the families Fanniidae and Muscidae. *Proceedings of the Royal Irish Academy* (B) **78**(2), 13-43.
- O'Connor, J.P. 2001. *Agromyza anthracina* Meigen (Dipt., Agromyzidae) new to Ireland. *Entomologist's monthly Magazine* **137**, 154.

- O'Connor, J.P and Ashe, P. 1991. Ten species of Sciaridae (Diptera) new to Ireland. *Dipterists Digest (First Series)* **8**, 29-30.
- Pont, A.C. and Meier, R. 2002. The Sepsidae (Diptera) of Europe. *Fauna Entomologica Scandinavica* **37**, 1-221.
- Spencer, K.A. 1972. Diptera, Agromyzidae. *Handbooks for the Identification of British Insects* **10**(5g), 1-136. Royal Entomological Society, London.
- Spencer, K.A. 1973. A new species of Agromyzidae (Diptera) feeding on bracken (*Pteridium aquilinum* L.). *Entomologist's Gazette* **24**, 315-317.
- Spencer, K.A. 1976. The Agromyzidae (Diptera) of Fennoscandia and Denmark. *Fauna Entomologica Scandinavica* **5**, 1: 1-304; 2: 305-606.
- Spencer, K.A. 1990. Host specialisation in the World Agromyzidae (Diptera). *Series Entomologica*, vol. **45**, 1-444. Kluwer Academic Publishers.
- Stubbs, A.E. and Chandler, P.J. 2001. A provisional key to British Piophilidae (Diptera) and *Parapiophila flavipes* (Zetterstedt, 1847) new to Britain. *Dipterists Digest (Second Series)* **8**, 71-78.
- Walker, F. 1856. *Insecta Britannica Diptera*. Vol. 3, 352 pp. 30 pls. Lovell Reeve, London.
- Withers, P. 1987. The British species of the genus *Suillia* (Diptera, Heleomyzidae), including a species new to science. *Proceedings and Transactions of the British entomological and natural history Society* **20**, 91-104.
- Withers, P. 1997. *Tonnoiriella disneyi* sp. n. and *Threticus balkaneolpinus*, new to Britain (Diptera, Psychodidae). *Dipterists Digest (Second Series)* **4**, 61-64.
- Withers, P. 2002. Thirty-nine species of Diptera new to Ireland, including a species of Psychodidae new to the British Isles. *Dipterists Digest (Second Series)* **9**, 113-119.
- Withers, P. and O'Connor, J.P. 1992. A preliminary account of the Irish species of moth fly (Diptera: Psychodidae). *Proceedings of the Royal Irish Academy (B)* **92**(5), 61-77.

## **A breeding site survey of Simuliidae (blackflies) in South East England. Part 2: Broad distributional findings**

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### **Summary**

Data presented in Part 1 of this work (Crosskey and Crosskey 2002) describing a general survey of simuliid breeding sites conducted over 40 years in South East England are reviewed for their broader distributional implications vis-à-vis geology and other environmental factors. Negative areas where no breeding is possible because of adverse or non-existent lotic habitat are noted, the prevalence and co-occurrence of taxa briefly discussed, and the fauna of the named rivers of South East England tabulated. The recorded distribution is mapped for some species which show a distinct dependence on certain kinds of habitat related to the basic geology.

### **Introduction**

In Part 1 of this work (Crosskey and Crosskey 2002) we presented the results, species by species, of a survey we made for breeding sites of Simuliidae (blackflies) in South East England over the period 1961-2001. The 800 positive sites, that is to say aquatic habitats at which at least one species was represented in the sample, were listed with their 100-metre accuracy Ordnance Survey grid references, maps were provided on the 10km square basis, and notes were included on the preferred lotic habitats and seasonality of individual species. In this second (and concluding) part we discuss briefly some general aspects of simuliid breeding in the survey area, including discussion of the negative areas (Fig. 1), the broad relationship to drainage and geology (Figs 2 and 3), the prevalence (Table 1) and co-occurrence of the species and complexes (Fig. 4), and the simuliid fauna of the rivers (Fig. 5).

For all the data provided in both parts of this work there are voucher specimens in the Diptera collection at The Natural History Museum (London), where the original record cards are also deposited. Detailed information on material and collecting methods is provided in Part 1.

### **Negative areas**

In the course of our survey we prospected each of the 10km squares forming South East England as defined for our purpose (Part 1), eyeing each square for the existence of the most likely kinds of habitat to be productive - rivers, middle-sized streams, tiny streams (e.g. heathland rills, chalk spring-streams, man-made ditches, seepages) and lake outfalls. Nearly all squares were positive (Fig. 1, solid circles), several breeding sites of multiple species usually being found; however, we treat a square as positive even if only one species was collected at one site (an uncommon circumstance). In some squares (Fig. 1, open circles) we could find no breeding sites at all, and these squares we treat as negative - not only because we found no breeding site in them but because they mostly lack lotic habitat that could support simuliid breeding. The negative areas of any size are principally coastal, urban, or streamless chalk upland, but at the local microhabitat level stream pollution also plays some part. Each aspect is briefly considered as follows.

*Coastal negative areas.* In Sussex there are two main negative areas of different character, the upland chalk of the South Downs (Fig. 2) and the flat almost contourless areas of former floodplain marsh now forming the drained grazing land of the Pevensy Levels and Rother Levels. In the former area (as near Beachy Head) the valleys are dry and no streams breach the cliff coastline (only a few rivers do so and these are tidal for some way inland); in the



latter areas there is surface water but it lies mainly in virtually stagnant man-made drainage dikes and sewers or channelled natural streams, the latter typically covered with duckweed (*Lemna*) and devoid of substrate - i.e. they are unsuitable for the filter-feeding larvae of simuliids. Similar conditions exist near the Kent coast; in this county notable negative areas are Romney Marsh and the shingle promontory of Dungeness. Along the Thames estuary of Kent and Essex, and further north along much of the Essex flatland, the coastline is formed largely of salt marshes with dikes and drainage channels inland of these, again conditions unsuited to simuliid breeding.

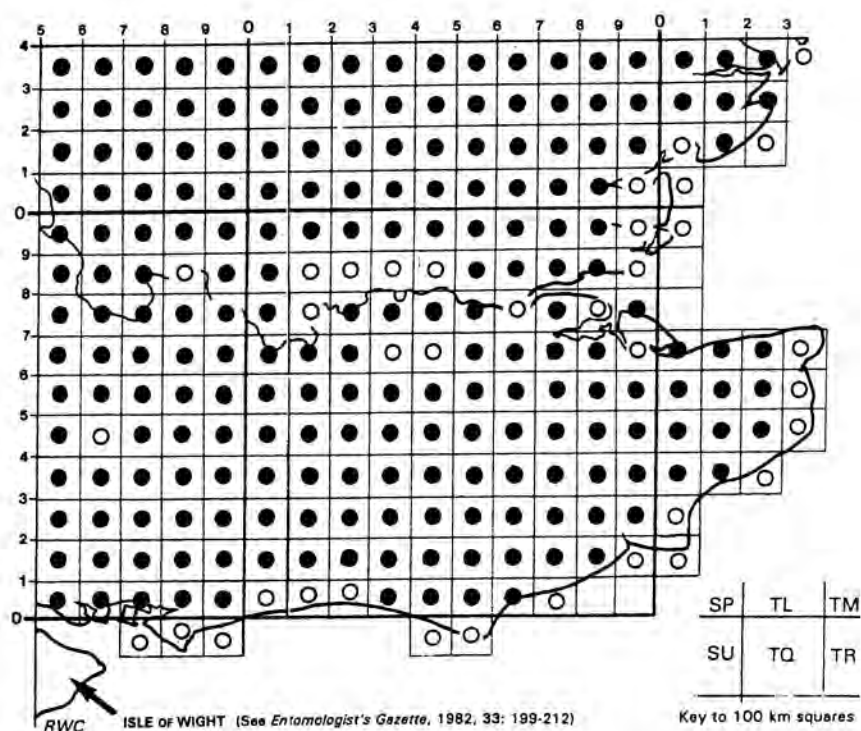
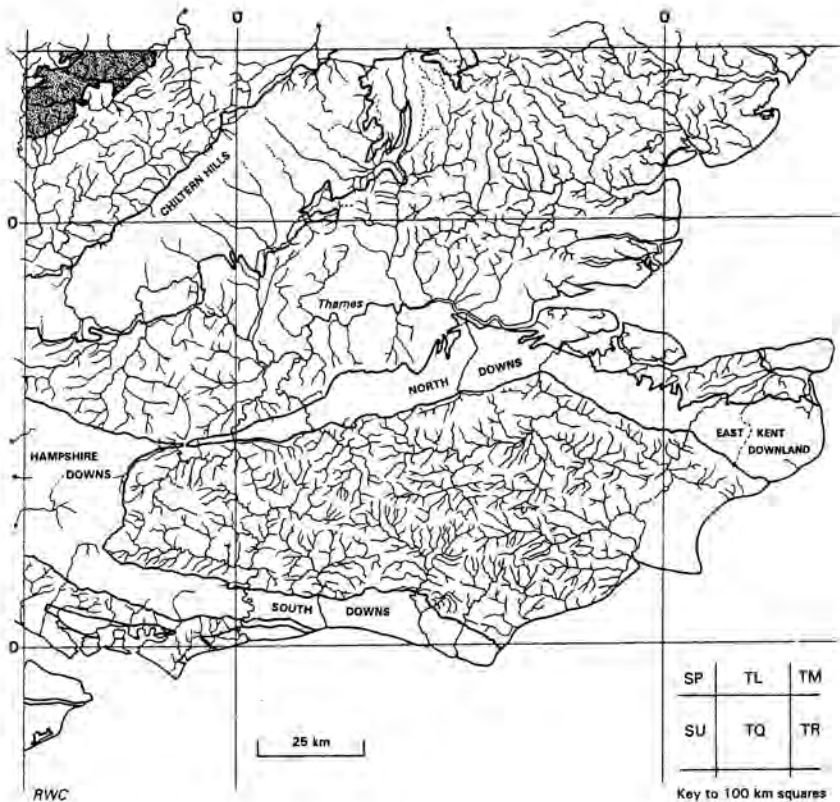


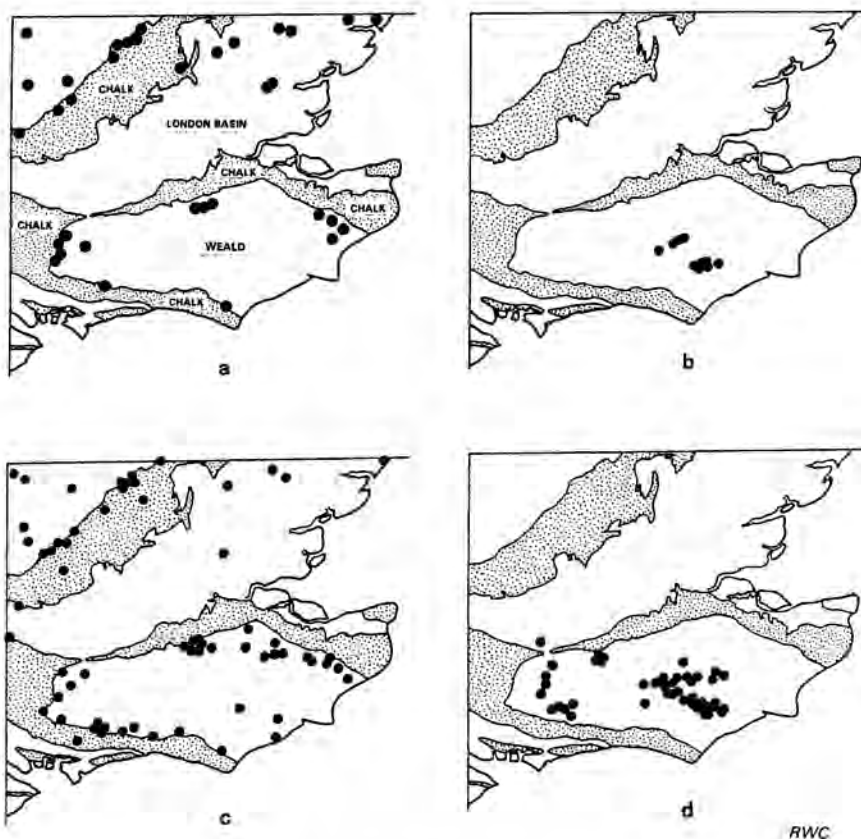
Fig. 1. Survey findings for the breeding distribution of Simuliidae in South East England recorded on the 10km square basis: solid black dots = positive squares (at least one species found), open circles = negative squares (no sites found and breeding very improbable, see text).





**Fig. 2. Drainage system and chalklands of South East England. Chalk areas (cf. Fig. 3a) indicated by heavy outlines to the named uplands. Shaded area upper left indicates a band of Jurassic limestone.**

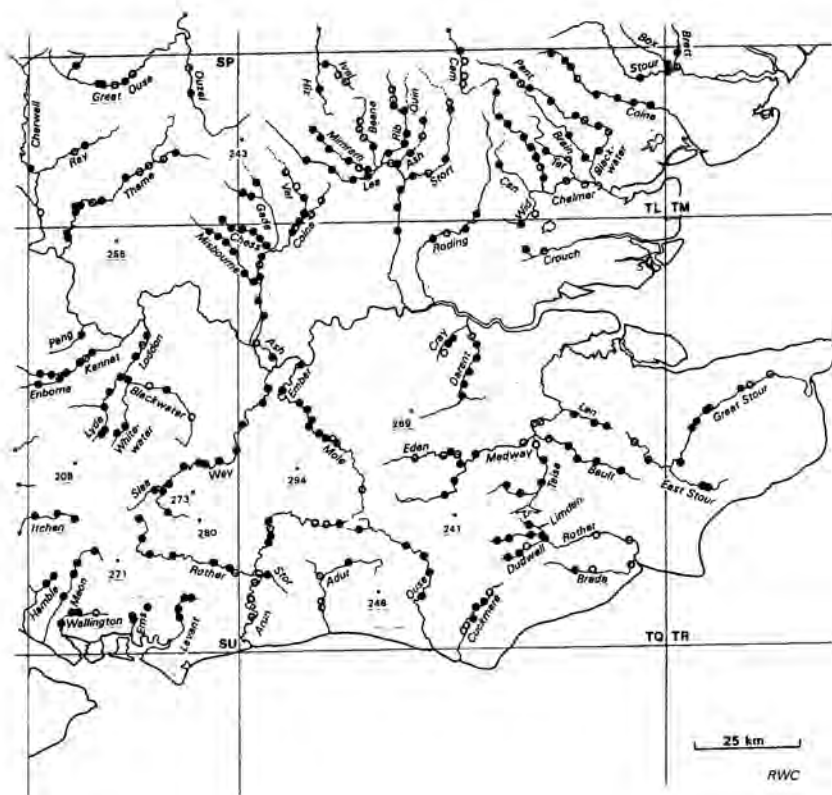
*London area.* The open circles near the centre of the Fig. 1 map reflect urbanized London, where several rivers and streams that once flowed on the surface (and historically would have had some simuliid fauna) are now partly or entirely underground and functioning as sewers (see Barton 1982). Surface-flowing stretches often lack substrate or are polluted (or both). An account of simuliids in the London area has been given earlier (Crosskey 1985). An indication of the general unsuitability of London watercourses for simuliids is given by Aston and Andrews (1978) who, in a survey of the macroinvertebrate fauna obtained only a few simuliid larvae from four out of 16 Thames Basin rivers (excluding the Darent) that they sampled.



**Fig. 3.** Distribution recorded for four species closely associated with the geological background provided by the chalk edges (left-hand maps) and the Weald (right-hand maps): (a) *Simulium costatum* and (c) *Simulium trifasciatum*, (b) *Prosimulium tomosvaryi* and (d) *Simulium cryophilum sensu lato*.

*Chalklands.* The blocks of chalk that form the characteristic upland ridges of South East England give rise to many spring-streams at their edges but are in themselves generally waterless on the surface, that is except for the lower-lying rivers that have cut through the chalk of the North and South Downs. The 10km squares on these chalk areas are largely negative for simuliid breeding and one of them completely so. Square SU 64 (Fig. 1) in the central Hampshire Downs is totally negative as it lacks even a peripheral spring to provide any breeding





**Fig. 5.** Map showing the named rivers of South East England and the positions of the positive (solid black dots) and negative (open circles) collecting sites. Results include collection data for at least one site on each river. Spot heights are in metres above sea level and included for amplification of the map in Fig. 2

**Pollution.** At microdistributional level pollution can be, and in some areas often is, a factor causing the watercourses to be negative for simuliid breeding when they would be suitable in their unpolluted state. Chemical pollutants entering the streams adversely affect nearly all species, only *S. ornatum* complex being significantly pollution tolerant. Most pollution that affects simuliid breeding in South East England is associated with farming rather than urbanization, and takes the form of fertilizer run-off into the streams in crop-growing areas and the discharge of livestock slurry in dairy herd areas; the latter can, for a brief distance, convert a stream into an agricultural sewer - coinciding with a slurry discharge when collecting near a dairy farm is the least pleasant of all sampling hazards! (On the other hand, physical pollution is frequently beneficial for simuliids because it can produce disturbed water and firm substrate suitable for breeding sites when these are naturally lacking in a stream. Fly-tipping of

material waste is particularly rife at bridges over streams and when collecting in such places we have obtained larvae and pupae from an enormous range of discarded objects, including solidified cement bags, masonry rubble, plastic sacks, refrigerator carcasses, window-blind slats, vehicle hub-caps, bedstead frames, and the inside canvas - but never the rubber - of old motor tyres.)

### Breeding distributions and basic geology

Basic geology dictates several factors that bear upon the occurrence and distribution of simuliids, especially the drainage system that is associated with the landscape topography, and the freshwater chemistry associated with the underlying rocks. We have not studied the rivers and streams of South East England in relation to these aspects *per se*, but our distribution data allow us to deduce certain relationships between where species are found and the geological background. The dominating factor is the Chalk, the only form in which limestone occurs in our South East England sampling area (excluding a very small part of the Jurassic limestone formation which crosses the extreme northwest). The thick lines on the map (Fig. 2) show the limits of the Chalk, the formation that forms the smooth gentle higher ground of the Chilterns, North and South Downs, the Hampshire Downs and the East Kent Downland. Three particular features of the drainage system pertaining to the Chalk are evident on the map: very few rivers cut through the chalk of the North and South Downs; the Chilterns are characterized by many small chalk-streams issuing from the scarp (northern) slope and by a parallel series of modest-sized rivers on the dip (southern) slope; and that from the North and South Downs an abundance of small streams flows into the Weald.

The Weald, lying between the North and South Downs (Figs 2 and 3a) and primarily represented in East Sussex, is an area of entirely different character from the chalklands. It is geologically older than the Chalk and comprises an uplifted area from which the chalk has been eroded away, the North and South Downs being the surviving edges of a once-continuous dome of solid chalk (Trueman (1971) gives a detailed account of the Wealden beds relative to the Chalk). The Weald is abundantly supplied with surface-fed, acidic, streams that flow for the most part on heavy clay woodland soils or on more porous open heathland soils. In East Sussex some streams, known as 'ghylls', lie in steep-sided wooded valleys and in places flow fast over pebble beds. The chalk streams, by contrast, have beds of smooth sediment and the water is typically alkaline from the high calcium carbonate content. Moreover, with the exception of the Chilterns (which in some areas carry extensive stands of woodland) the upland chalk areas are in general conspicuously devoid of woodland, particularly on parts of the Hampshire Downs and the South Downs.

Several of the 22 simuliid species and complexes in South East England are more or less generalists, breeding in various types of watercourse and evidently not dependent on factors directly associated with chalk versus non-chalk areas. For example, the chalk rivers from the Chilterns, the rivers that cut through the chalk ridges in East and West Sussex and North Kent, and mid-Wealden rivers support the same spectrum of common species, notably *Simulium equinum*, *S. erythrocephalum*, *S. lundstromi*, *S. ornatum* complex and, less commonly, *S. angustipes*. *Simulium vernum* complex is found in both chalk and Wealden streams, but in this case it is likely that two or more sibling species are involved which have different ecological requirements.

Species showing the most definite relationship to the chalk areas are *Simulium costatum* and *S. trifasciatum*, our distribution records of which are plotted on the maps in Figs 3a and 3c. Both species breed almost entirely in spring-fed chalk streams, typically very near the sources, a fact especially evident from the chains of sites along the spring-line of the northern edge of the Chiltern Hills (cf. positions of the spot symbols and the tiny streams shown on Fig. 2), at the eastern edge of the Hampshire Downs, and at the southeastern edge of the North Downs in Kent.

**Table 1. Prevalence and principal aquatic habitats of South East England Simuliidae.** Species and complexes are listed in descending order of prevalence as judged by the number and percentage of sites at which they were collected (total of sampled sites 800). *M.*, *Metacnephia*; *P.*, *Prosimulium*; *S.*, *Simulium*; s.l. = *sensu lato*. Parentheses round a plus sign indicate that the habitat is sometimes recorded but is unusual.

| Species                   | Sites  |       | Rivers | Streams and small brooks | Chalk spring sources | Heath-land rills | Lake outfalls weirs, and old millraces |
|---------------------------|--------|-------|--------|--------------------------|----------------------|------------------|----------------------------------------|
|                           | Number | %-age |        |                          |                      |                  |                                        |
| <i>S. ornatum</i> s.l.    | 448    | 56.0  | +      | +                        | (+)                  | -                | (+)                                    |
| <i>S. angustipes</i>      | 225    | 28.1  | +      | +                        | -                    | (+)              | -                                      |
| <i>S. verum</i> s.l.      | 216    | 27.0  | +      | +                        | -                    | +                | -                                      |
| <i>S. equinum</i>         | 119    | 14.9  | +      | (+)a                     | -                    | -                | -                                      |
| <i>S. noelleri</i>        | 100    | 12.5  | (+)b   | (+)b                     | -                    | -                | +                                      |
| <i>S. erythrocephalum</i> | 92     | 11.5  | +      | (+)a                     | -                    | -                | -                                      |
| <i>S. trifasciatum</i>    | 66     | 8.3   | (+)    | +                        | +                    | -                | -                                      |
| <i>S. cryophilum</i> s.l. | 50     | 6.3   | (+)    | +c                       | -                    | -                | -                                      |
| <i>S. lundstromi</i>      | 49     | 6.1   | +      | (+)a                     | -                    | -                | -                                      |
| <i>S. angustitarse</i>    | 43     | 5.4   | (+)    | +                        | (+)                  | -                | -                                      |
| <i>S. costatum</i>        | 35     | 4.4   | -      | -                        | +                    | -                | -                                      |
| <i>S. latipes</i>         | 24     | 3.0   | (+)    | +                        | -                    | +                | -                                      |
| <i>S. urbanum</i>         | 12     | 1.5   | -      | +                        | -                    | +                | -                                      |
| <i>P. tomosvaryi</i>      | 10     | 1.3   | +      | +                        | -                    | -                | -                                      |
| <i>S. intermedium</i>     | 7      | 0.9   | +      | +                        | -                    | -                | -                                      |
| <i>S. posticatum</i>      | 7      | 0.9   | +      | -                        | -                    | -                | -                                      |
| <i>M. amphora</i>         | 5      | 0.6   | +d     | -                        | -                    | -                | -                                      |
| <i>S. lineatum</i>        | 5      | 0.6   | +      | -                        | -                    | -                | -                                      |
| <i>S. pseudequinum</i>    | 5      | 0.6   | +      | -                        | -                    | -                | -                                      |
| <i>S. reptans</i>         | 5      | 0.6   | +      | -                        | -                    | -                | -                                      |
| <i>S. armoricanum</i>     | 2      | 0.3   | -      | +                        | -                    | -                | -                                      |
| <i>S. aureum</i>          | 1      | 0.1   | -      | -                        | -                    | +                | -                                      |

a Only large streams

b In river habitats often indicative of falling water (e.g. small weir) somewhere upstream of the sampling site

c Usually small brooks with stony riffles

d In chalk winterbournes only

Lastly, *Metacnephia amphora* should be mentioned in relation to the Chalk. This rare species is restricted to chalk winterbournes, in which it has been found in Dorset (type locality) and in the course of our samplings in the Lavant and Ems winterbournes of West Sussex; the biology is apparently geared to a flow regime in which the chalk aquifers are insufficiently filled to maintain flow through the summer months.

Species showing a very obvious relationship to the Weald, and its acid streams, are *Prosimulium tomosvaryi* of East Sussex (Fig. 4b) and *Simulium cryophilum* of (mainly) East and West Sussex. These species are mapped on the basis of our data in Figs 3b and 3d respectively. Another species that, in South East England, certainly occurs only in the Weald is *S. armoricanum*, a close relative of *S. cryophilum* complex; we have found it at only two sites (see Part I, Fig. 3A), both of these in the same kind of acidic woodland stream habitat as *S. cryophilum* complex. Last, regarding the Weald, should be mentioned *S. aureum*; this species we have found only in one heathland stream located in the westwards extension of the Weald proper into West Sussex.

The part of South East England that forms the London Basin and stretches eastwards from near Newbury through the Thames river basin, between the chalk of the Chilterns and North Downs, into Essex (see Fig. 3a) has no simuliids that are specially characteristic of the area. It is geologically younger than the Weald and the Chalk and is mainly London Clay, a low-lying formation of heavy clay formerly well wooded but now almost all given over to agriculture where not urbanized. There are many soft-bottomed rivers and streams (Fig. 2) of a character unattractive to specialist simuliids and the species present are mainly generalists - *Simulium angustipes*, *S. equinum*, *S. erythrocephalum*, and *S. ornatum* and *S. venum* complexes.

#### Lake outfall and equivalent distribution

South East England almost entirely lacks natural lakes but is well provided with man-made lakes and ponds, many in the grounds of stately homes - where impounding a stream to create a lake has historically been some kind of status symbol. Other lakes represent relics of a locally important industrial past when ponds were artificial impoundments providing water pressure to operate mill-wheels. In the Wealden area many water bodies still have the name Hammer Pond or Furnace Pond, alluding to devices used for several centuries (mainly in the oak woods of East Sussex) for the crushing and smelting of iron ore. Broken down brick walls, steps and spillways of these structures create ideal microhabitat for *Simulium noelleri* and Roger Wotton's (see Part I) research site for this species near Horsmonden in Kent is a perfect example, still known by the name Furnace Pond. *Simulium noelleri* is a species, the only one in South East England, that is pre-eminently associated with 'outfalls' from lakes, places where egress into the draining stream or the next pond down a chain of ponds, is effected not by a gentle near-level seepage outflow but by a sharp drop of the water level. Breeding is found, too, at other places, such as river weirs, when these replicate the sharply-falling water conditions of a lake outfall. Given this microhabitat requirement it seems certain that it is the human creation of the right conditions that has allowed *S. noelleri* to become so generally present and common in South East England in a way it could not otherwise have been (we have collected it at 100 sites in 11 counties). The species is generally recognized as a past-master at quickly exploiting new outfall sites, for example when a pond outfall was newly created in a public garden in Liverpool and when uncut reeds between the ponds on Richmond Common briefly dammed the flow (Crosskey 1985). In our data, 62% of *S. noelleri* sites were at lake or pond outfalls, 20% at rivers controlled by weirs, 6% at old mill sites, and 12% in ordinary streams where there was no abrupt change in water level but where outfalls probably existed upstream of the collection points. (When only a few larvae or pupae are found, as in these stream sites, it is usually an indicator that larval drift from an outfall has taken place).



### Taxa prevalences and co-occurrences

Since the distribution of species and complexes differs greatly according to their environmental needs, particularly regarding preferred lotic habitats, it is difficult to assess relative prevalences in a meaningful way. Still, it is reasonable to compare one with another, if only in a rather crude way, by ranking them in order of the number and percentage of occurrences at the total of 800 collecting sites. Table 1 (page 142) provides these data in conjunction with a summary of the usual lotic habitat of each taxon.

In many sites different species are found breeding together, the larvae and pupae intermixed on the same substrates. Six was the highest number of species collected at any one site (Site 26, Thame river, SP 612028) but this was not on the same date and five was the maximum number present in a single collection. For our 800 sampling sites the total numbers of sites with one species or with multiple species collected simultaneously are as follows: one species only, 373 sites (47%); two species present, 248 sites (31%); three species present, 115 sites (14%); four species present, 47 sites (6%); five species present, 17 sites (2%).

The co-occurrence of each possible species pair amongst 21 of the species and species complexes found in our survey (*S. aureum* found at one site only is omitted) is demonstrated by the association diagram in Fig. 4. Among the 210 notionally possible instances of sympatric breeding 91 are actually recorded in our data; the remaining 119 pair associations were never found, prevented presumably by the very different aquatic habitat requirements of the species involved. Numerals on the association diagram are the actual numbers of sites at which each species pair was recorded. They show at a glance that some associations are rare, 23 of them having been found only once in the samples from 800 sites. On the other hand, quite high numbers demonstrate the well-known commonplace associations such as those of *S. angustipes* and *S. ornatum sensu lato* with *S. vernum sensu lato*, of the first two of these with each other, and of *S. equinum* with *S. erythrocephalum*. (These five taxa, it may be commented, belong to different subgenera, the association being an ecological one and unrelated to taxonomic affinity.)

### Riverine distributions

Defining the difference between a river and a stream is a vexing question for freshwater ecologists. Some tributary streams of larger rivers in an extensive drainage basin are often longer and carry more water than some small rivers that are the largest watercourse in a small basin. In South East England most small watercourses are unnamed, so for the purpose of our sampling records we distinguish a 'river' as a watercourse that has, on the 1:50,000 'Landranger' O.S. maps (and the old 'One-Inch Series' at 1:63,360), a name preceded by 'River' or 'R'. Defined in this way, and including the few small degraded rivers that still flow through urban London, there are about 75 rivers in South East England as covered in our survey. We have prospected 68 (91%) of these, usually at several points, and have found at least one breeding site on each of them. The accompanying map (Fig. 5) marks the positive sites by solid black circles and negative sites - points inspected but nothing found (usually because of poor flow or lack of substrate) - by open circles.

We have found 18 of the total 22 species/complexes of South East England to be represented in our material from the 68 prospected rivers (Table 2) - only *S. armoricum*, *S. aureum*, *S. costatum* and *S. urbanum* never having been found in the riverine milieu. However, of those that have been found, some - most notably *S. angustitarse*, *S. latipes* and *S. trifasciatum* - are not typical of the riverine simuliid community and perhaps occurred in samples mainly as the result of larval wash-down from the more usual habitats on feeder streams. The truly riverine fauna over all of South East England, as elsewhere in lowland Britain, includes dominantly *S. equinum* and *S. erythrocephalum* with frequent admixture in lesser numbers of *S. ornatum* complex, *S. lundstromi*, *S. angustipes* and (where there are river-weirs) *S. noelleri*. On



the western side of the survey area the rivers are locally inhabited by *S. lineatum* and *S. pseudequinum* (both close relatives of *S. equinum* in the subgenus *Wilhelmia*) and by *S. reptans*. The discovery of the last-named species in South East England is odd as *S. reptans* is pre-eminently a species of upland Britain. The key might lie in the fact that where it has been found breeding in the Wey and Rother (Surrey and West Sussex) these rivers have fast stony runs like the preferred habitat in other areas, whereas the rivers of South East England mostly have a more or less steady 'laminar' flow.

Excluding the Lavant and the Ems rivers of West Sussex, which are true chalk winterbournes and normally dry out every year in summer (and are the only habitat of *Metacnephia amphora*), the South East England rivers - though showing some natural seasonal variation in summer and winter water levels - are more or less permanently flowing. However, exceptional weather conditions can change this picture and have an effect on simuliid river occupancy. In the year 2000, for example, exceptionally heavy rainfall resulted in excessive ground-water run-off and overfilled aquifers, to the extent that many simuliid-inhabited rivers were flooded beyond their capacity - perhaps causing a massive wash-out of larval sites. In the severe summer drought of 1976 the opposite effect applied. Rivers such as the Darent (Kent) and Misbourne (Buckinghamshire) ceased to flow and dried out completely for long stretches, as also did several of the rivers of north Hertfordshire and Essex. In the latter areas the water table has also dropped greatly in the last few decades because of water abstraction for expanding communities and light industry and the result can be seen in the dried out upstream parts of almost all the rivers - these sometimes now being detectable as little more than dips in the ground. However, even these 'watercourses' began to run again in the spring of 2001 following heavy and sustained winter rain, though they were no doubt flowing too temporarily for the development of substrate and a food supply that would permit larval development. Certainly floods and droughts raise interesting questions of aquatic habitat recolonization. We have no data on this point. It is on record, though, that by 1993 a simuliid population was being re-established in a small Kentish chalk river that had run dry in places between February 1990 and July 1992, the most severe drought period in England since the 1850s (Wood 1995).

## References

- Aston, K.F.A. and Andrews, M.J. 1978. Freshwater macroinvertebrates in London's rivers 1970-77. *London Naturalist* **57**, 34-52.
- Barton, N.J. 1982. *The Lost Rivers of London: A study of their effects upon London and Londoners, and the effects of London and Londoners upon them*. 148 pp. Historical Publications Ltd, New Barnet, Herts.
- Crosskey, R.W. 1985. The blackfly fauna of the London area (Diptera: Simuliidae). *Entomologist's Gazette* **36**, 55-75.
- Crosskey, R.W. and Crosskey, M.E. 2002. A breeding site survey of Simuliidae (blackflies) in South East England. Part 1: Sampling sites and species distribution records. *Dipterists Digest (Second Series)* **9**, 25-60.
- Frueman, A.E. 1971. *Geology and scenery in England and Wales*. Revised edition by J.B. Whittow and J.R. Hartley. 400 pp. Penguin Books, Harmondsworth.
- Wood, P.J. 1995. Low flows and recovery of Simuliidae in the Little Stour, Kent. *British Simuliid Group Bulletin* **6**, 16-17.

**Table 2. Species and complexes collected from breeding sites in named rivers of South East England.** A slash between county names indicates that the stretch of river sampled is on the boundary of two counties. The county names abbreviated are: Beds, Bedfordshire; Berks, Berkshire; Bucks, Buckinghamshire; Hants, Hampshire; Herts, Hertfordshire, Northants, Northamptonshire; Oxford, Oxfordshire. Reference numbers for the species and species complexes are: 1, *Metacnephia amphora*; 2, *Prosimulium tomosvaryi*; 3, *Simulium angustipes*; 4, *S. angustitarse*; 5, *S. eryophilum* complex; 6, *S. equinum*; 7, *S. erythrocephalum*; 8, *S. intermedium*; 9, *S. latipes*; 10, *S. lineatum*; 11, *S. lundstromi*; 12, *S. noelleri*; 13, *S. ornatum* complex; 14, *S. posticum*; 15, *S. pseudequinum*; 16, *S. reptans*; 17, *S. trifasciatum*; 18, *S. vernum* complex.

| River          | County/counties                                     | Species or complex reference |
|----------------|-----------------------------------------------------|------------------------------|
| Adur           | West Sussex                                         | 12*                          |
| Arun           | West Sussex                                         | 6, 7, 13, 14                 |
| Ash (1)        | Herts                                               | 3, 6, 7, 11, 13, 18**        |
| Ash (2)        | Surrey                                              | 7                            |
| Beult          | Kent                                                | 12*, 13, 18                  |
| Blackwater (1) | Essex                                               | 3, 6, 7, 13                  |
| Blackwater (2) | Berks/Hants                                         | 6, 7, 13                     |
| Box            | Suffolk                                             | 3, 6, 7, 13                  |
| Brain          | Essex                                               | 6, 13                        |
| Brede          | East Sussex                                         | 13                           |
| Brett          | Suffolk                                             | 3, 6, 7, 11, 13              |
| Cam            | Essex                                               | 13                           |
| Can            | Essex                                               | 3, 13, 18                    |
| Chelmer        | Essex                                               | 3, 6, 7, 11, 12, 13          |
| Cherwell       | Oxford                                              | 3, 6, 7, 12, 13, 15          |
| Chess          | Bucks, Bucks/Herts, Herts                           | 3, 6, 11, 13                 |
| Colne (1)      | Essex                                               | 3, 6, 7, 12*, 13             |
| Colne (2)      | Bucks, Bucks/London, Herts,<br>Herts/London, London | 3, 6, 7                      |
| Cray           | London                                              | 13                           |
| Cuckmere       | East Sussex                                         | 3, 6, 7, 12, 13              |
| Darent         | Kent                                                | 3, 6, 7, 12, 13              |
| Dudwell        | East Sussex                                         | 2, 5, 13, 14, 17, 18**       |
| East Stour     | Kent                                                | 11, 13                       |
| Eden           | Kent                                                | 6, 12, 13                    |
| Ember          | Surrey                                              | 3                            |
| Ems            | West Sussex                                         | 1, 3, 9**, 11, 13, 17**, 18  |
| Enborne        | Berks, Berks/Hants                                  | 6, 13                        |
| Gade           | Herts                                               | 13, 18**                     |
| Great Ouse     | Bucks, Bucks/Northants                              | 6, 7, 10, 11, 13             |
| Great Stour    | Kent                                                | 3, 7, 11, 13                 |
| Hamble         | Hants                                               | 3, 13                        |
| Hiz            | Herts                                               | 13                           |
| Itchen         | Hants                                               | 13                           |
| Ivel           | Beds                                                | 3, 7, 13                     |
| Kennet         | Berks                                               | 6, 7, 10, 11, 13, 15         |
| Lavant         | West Sussex                                         | 1, 3, 9, 13, 18              |

|            |                                             |                                  |
|------------|---------------------------------------------|----------------------------------|
| Lea        | Essex/Herts, Essex/London,<br>Herts, London | 3, 6, 7, 13                      |
| Len        | Kent                                        | 3, 12, 13, 17                    |
| Limden     | East Sussex                                 | 13                               |
| Loddon     | Berks, Hants                                | 3, 6, 7, 13                      |
| Lyde       | Hants                                       | 4**, 13                          |
| Medway     | Kent                                        | 3, 6, 7, 12, 13                  |
| Meon       | Hants                                       | 3, 4**, 11, 13, 18               |
| Mimram     | Herts                                       | 3, 6, 13, 17*, 18**              |
| Misbourne  | Bucks                                       | 3, 6, 11, 13, 18                 |
| Mole       | Surrey                                      | 3, 6, 7, 13                      |
| Ouse       | East Sussex                                 | 3, 7, 8, 12*, 13                 |
| Ouzel      | Bucks                                       | 6, 7, 12*                        |
| Pang       | Berks                                       | 4, 6, 13, 17, 18                 |
| Pant       | Essex                                       | 3, 6, 7, 13                      |
| Quin       | Herts                                       | 13, 18                           |
| Ray        | Bucks/Oxford                                | 3                                |
| Rib        | Herts                                       | 3, 6, 11, 13, 18                 |
| Roding     | Essex                                       | 3, 6, 7, 11, 12, 13              |
| Rother (1) | East Sussex                                 | 3, 6, 7, 11, 13, 14              |
| Rother (2) | West Sussex                                 | 6, 7, 13, 14, 16                 |
| Slea       | Hants                                       | 3, 13                            |
| Stor       | West Sussex                                 | 3, 6, 11, 13                     |
| Stort      | Essex/Herts, Herts                          | 3, 6, 7, 11, 13, 18              |
| Stour      | Essex, Essex/Suffolk, Suffolk               | 6, 7, 12*                        |
| Teise      | Kent                                        | 6, 7, 8, 12*, 13                 |
| Ter        | Essex                                       | 3, 13                            |
| Thame      | Bucks, Bucks/Oxford, Oxford                 | 3, 6, 7, 10, 11, 12*, 13, 14, 15 |
| Ver        | Herts                                       | 3, 6, 7, 13                      |
| Wallington | Hants                                       | 3, 13, 18                        |
| Wey        | Hants, Hants/Surrey, Surrey                 | 6, 7, 12*, 13, 16                |
| Whitewater | Berks/Hants, Hants                          | 6, 12*, 13                       |
| Wid        | Essex                                       | 3, 7                             |

\* Collected at a falling water site (weir or millrace)

\*\* Collected only near the river's source

## Corrections and changes to the Diptera Checklist (8) - Editor

It is intended to publish here any corrections to the text of the recently published Diptera checklist (publication date was 13 November 1998; the final 'cut-off' date for included information was 17 June 1998) and to draw attention to any subsequent changes. All readers are therefore asked to inform me of any errors or changes and I would like to thank all those who have already brought these to my attention.

The 2000-2001 volume of *Zoological Record* has (November 2002) yet to be published.

In the notes below where names of genera and species are given as in the Checklist, authorship is not stated here. Corrections are listed under the relevant page numbers. Changes are listed under families; names new to the British list are given in bold type.

The notes below refer to the loss of no names due to synonymy, but one deletion (indicated by \*) and addition of 18 species, a net gain of 17 resulting in a new total of 6752 species.

### Corrections

(corrections to pages 152-154 are following Roháček 2001 – see under Changes below)

- p. 152 Under *Norrbonia costalis*, should be *vitripennis*; Haliday, 1836, misident. (not preocc.)  
*Archicollinella penteseta* should be Richards, 1929 not 1924  
Under *Elachisoma aterrimum*, original genus for *nigerrimum* should be *Limosina*
- p. 153 Under *Opalimosina czernyi*, original genus for *lambi* should be *Limosina*  
Under *Spelobia sensu stricto*, original genus for *manicata*, *palmata* and *talparum* should be *Limosina*  
*Trachypella lineafrons* author should be in parentheses: (Spuler, 1925 – *Leptocera*)
- p. 154 Under *Lotobia pallidiventris*, *hyalipennis* should be (Meigen, 1835) not 1830  
*Sphaerocera curvipes* should be Latreille, 1805 not 1804

In the first Corrections and Changes (1999, *Dipterists Digest (Second Series)* 6, 61) under Anthomyiidae, the species assigned to subgenus *Pegomya* should include *cunicularia*, not *cunicularis* as stated.

### Changes

**Sciaridae.** The following species are added in the present issue from both Britain and Ireland:  
*Bradysia leptoptera* Tuomikoski, 1960 +  
*Bradysia nocturna* Tuomikoski, 1960 +  
*Leptosciarella cerifera* Mohrig & Menzel, 1997 +

The following species is elevated from synonymy in the present issue:  
*Leptosciarella subspinulosa* Edwards, 1925 +

**Psychodidae.** The following species is added from Ireland only in the present issue:  
*Sycorax feuerborni* Jung, 1954 ++

**Hybotidae.** The following species was added by S.M. HEWITT and M. CHVÁLA (2002, Description of a new Western European *Tachydromia* species (Diptera: Hybotidae) of the *Tachydromia connexa*-Group. *British Journal of Entomology and Natural History* 15, 65-70):  
*Tachydromia edenensis* Hewitt & Chvála, 2002

**Dolichopodidae.** A new synonymy affecting the introduced *Chrysotus* species found in hothouses was proposed by N.L. EVENHUIS (1995. New records and synonymies of Hawaiian Diptera. *Bishop Museum Occasional Papers* **46**, 27-28), although the name *longipalpus* was given in error as *longipalpis* in that paper. It is uncertain whether this species still occurs in Britain as it was last recorded at Kew in 1939 (C.E. Dye *pers. comm.*).  
*Chrysotus longipalpus* Aldrich, 1896 = *pallidipalpus* van Duzee, 1933

**Platypzeidae.** The following species is added in the present issue:  
*Agathomyia sexmaculata* (von Roser, 1840 – *Calomyia*)

**Phoridae.** The following species was added by R.H.L. DISNEY (2002. A new species of *Megaselia* (Rondani) from Hayley Wood, Cambridgeshire (Diptera: Phoridae). *Entomologist's Record and Journal of Variation* **114**, 189-191):  
*Megaselia symondsii* Disney, 2002

**Pipunculidae.** Opinion 2000 (Case 3132) (2002. *Bulletin of Zoological Nomenclature* **59**(2), 143-144) has conserved the name *Eudorylas* by designation of *Pipunculus fuscipes* as type-species, so present usage of *Eudorylas* and *Microcephalops* can continue.

**Tephritidae.** The following species was added by A.E. WHITTINGTON (2002. *Terellia fuscicornis* (Loew, 1844) (Dipt., Tephritidae) new to Britain. *Entomologist's monthly Magazine* **138**, 119-120):  
*Terellia* (sensu stricto) *fuscicornis* (Loew, 1844 – *Trypeta*)

**Sepsidae.** Two additions to the British list were made by A.L. OZEROV (1999. 88. Fam. Sepsidae. pp. 556-570. In Lehr, L.P. (ed.) *Keys to the insects of the Russian Far East. 6. Diptera and Siphonaptera*. Part 1, 665 pp. Dal'nauka, Vladivostok), who simply stated "Great Britain" (in Russian). These have been overlooked but attention was drawn to them by A.C. PONT and R. MEIER (2002. The Sepsidae (Diptera) of Europe. *Fauna Entomologica Scandinavica* **37**, 221 pp.), who also stated "Great Britain". Material of both is in the Oxford University Museum; the *Meropterus* is a possible introduction; found at a sewage works in Middlesex and in Dorset, while the *Sepsis* may have been confused with *S. punctum* (Adrian Pont *pers. comm.*):  
*Meropterus fukuharai* (Iwasa, 1984 – *Xenosepsis*)  
*Sepsis luteipes* Melander & Spuler, 1917

**Odiniidae.** The following species is added in the present issue:  
*Odinia czernyi* Collin, 1952

**Agromyzidae.** The following species are added in the present issue:  
*Melanagromyza eriolepidis* Spencer, 1961  
*Cerodontha spinata* (Groschke, 1954 – *Phytobia*)  
*Napomyza carotae* Spencer, 1966  
*Phytomyza robustella* Hendel, 1936

The following species was also overlooked in the checklist. It is a stem borer of chicory *Cichorium intybus* and was stated to be found in England by K.A. SPENCER (1990. Host specialisation in the World Agromyzidae (Diptera). *Series Entomologica* **45**, 1-444. Kluwer Academic Publishers):  
*Napomyza cichorii* Spencer, 1966

**Sphaeroceridae.** A number of changes result from J. ROHÁČEK (Ed.) (2001. *World Catalog of Sphaeroceridae (Diptera)*. 414 pp. Slezské Zemské Muzeum Opava; publication date given as 15.12.01):

*Norrbomia nilotica* (Becker, 1903 – *Borborus*) = *nitidifrons* (Duda, 1923)

RACHISPODA generic rank rather than subgenus of LEPTOCERA, following Wheeler (1995; see Note 2 in checklist); consequently *brevior*, *gel*, *kabuli*, *longior* and *opinata* should now have parentheses around author's names as they were described in *Leptocera*.

\*Delete *R. breviceps* (Stenhammar, 1855) (not confirmed as a British species; also see Note 2) Delete ? before *Minilimosina bicusps* (confirmed as a British species in Catalog and in this issue)

*Minilimosina (Svarciella) v-atrum* (Villeneuve, 1917) = *splendens* (Duda, 1928)

*M. (S.) guestphalica* (Duda, 1918) = *v-atrum*: authors including checklist

Delete Subgenus PARALIMOSINA sensu stricto (subgenera not recognised in *Paralimosina*)

*Pullimosina* (sensu stricto) *moesta* (Villeneuve, 1918) = *antennata* (Duda, 1918)

*P. (sensu stricto) vulgesta* Roháček, 2001 = *moesta*: authors including checklist

Subgenus MINUSCULA reduced to synonymy with TRACHYOPELLA sensu stricto

Under *Ischiolepta pusilla* delete ? *parapusilla* from synonymy

*I. vaporariorum* (Haliday, 1836) = *parapusilla* (Duda, 1920 – *Sphaerocera*)

The following species is added in the present issue:

*Spelobia (Spelobia) belanica* Roháček, 1983

**Fanniidae.** The following nomenclatural changes result from A.C. PONT (2002. The Fanniidae (Diptera) described by J.W. Zetterstedt. *Insect Systematics and Evolution* **33**, 103-112):

*Fannia lucidula* (Zetterstedt, 1860 – *Aricia*) = *glauescens*: authors, misident. (*Aricia glaucescens* Zetterstedt, 1845 becomes a synonym of *F. armata*)

*Piezura graminicola* (Zetterstedt, 1846) **sp. rev.** = *boletorum* Rondani, 1866

*Piezura pardalina* Rondani, 1866 = *graminicola*: authors, misident.

**A correction to the key to British Piophilidae (Diptera)** – In our paper on the Piophilidae (2001. *Dipterists Digest (Second Series)* **8**, 71-78) a correction is necessary to the key provided. In the first option of couplet 6 it is stated for *Protopiophila latipes* (Meigen) that the head is extensively yellow. This needs to be corrected because the head of *P. latipes* is in fact almost entirely black, but the species may still readily be determined from the combination of other characters given. We would like to thank Del Smith for bringing this error to our attention – **ALAN STUBBS** and **PETER CHANDLER**

***Melanagromyza eriolepidis* Spencer, 1961 and *Cerodontha spinata* (Groschke, 1954) (Diptera, Agromyzidae) new to Britain.**

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**Summary**

The discovery is reported of two species of Agromyzidae new to the British Isles, *Melanagromyza eriolepidis* Spencer, 1961 and *Cerodontha spinata* (Groschke, 1954), found in Somerset in 2001, associated with *Cirsium eriophorum* and *Carex sylvatica* respectively.

***Melanagromyza eriolepidis* Spencer, 1961**

During survey work on the Polden Hills on behalf of the National Trust in 2001 many flies of the genus *Melanagromyza* were noted on the numerous woolly thistles *Cirsium eriophorum* at Walton Hill and Collard Hill and a pair was taken at the latter site on 20 June. It was clear that the species was closely associated with woolly thistles as they were only seen on this plant, although spear thistles *C. vulgare* and musk thistles *Carduus nutans* were in the immediate vicinity. One female was even noted ovipositing on a woolly thistle.

On 17 February 2002 I returned to both sites where the specimens were seen in the summer and collected stems of dead woolly thistles. From these a large number of *Melanagromyza* adults emerged. Initially, all those emerging proved to be *M. aeneoventris* (Fallén) but after most of these had emerged *M. eriolepidis* also appeared in good numbers. As the thistle stems were kept indoors the emergence dates do not correlate with natural emergence, but it does suggest that *M. eriolepidis* has a later emergence period than does *M. aeneoventris*.

In 2002 a few large bluish *Melanagromyza* were found on *Cirsium eriophorum* near Houndsfield Beacon, Gloucestershire on 27 June. The single male retained also proved to be *M. eriolepidis*. Thus it seems likely that the species is widespread on the limestone of Somerset and Gloucestershire, where its foodplant is common.

**Identification**

When I attempted to identify the specimens I immediately ran into problems. In the key by Spencer (1972) they ran readily to couplet 3, but all three of the possibilities thereafter seemed unlikely on the basis of host association. Once the male specimen was dissected it became certain that it was not a species keyed by Spencer (1972). In Spencer (1976) it keyed to couplet 3 readily but did not fit either *M. tripolii* Hering or *M. angeliciphaga* Spencer in the form of the aedeagus. It was then keyed using Spencer (1966), which covers the European species of this genus. Although the external characters used in the key are difficult to interpret, the genitalia illustrations in this work enabled identification as *M. eriolepidis*. The specimens were then sent to David Henshaw who confirmed the identification. The genitalia are figured here in Figs 1-6.

All of the British species which share with *M. eriolepidis* an essentially pale white to ochreous (rather than dark brown to black) squamal fringe, and orbital setulae entirely proclinate, have quite different genitalia. *M. angeliciphaga* is easily distinguished by the very large gap between the basiphallus and the distiphallus, longer than the latter. *M. limata* Spencer also has very distinctive genitalia with the distiphallus very flattened in lateral view, with strongly sclerotised apical parts. The distiphallus of *M. tripolii* is also more flattened and does not have the apical tube projecting.

Spencer (1990) listed only four species of *Melanagromyza* that develop in *Cirsium*, two of them currently only known in the New World. If specimens of this genus are reared from *Cirsium* the only possibilities currently known from Europe are *M. eriolepidis* and the common *M. aeneoventris*. The latter species is a little smaller and has the inner row of orbital setulae reclinate and only two lower orbital bristles. The clearest distinction to be seen in the male genitalia is the much smaller gap between the basiphallus and distiphallus, and the shape of the basiphallus, forming an almost complete ring in *M. aeneoventris*. The puparium of *M. aeneoventris* is paler, whitish or pale yellow, the posterior spiracles with the central horn surrounded by 14 to 18 distinct bulbs (Spencer 1966). In the German examples of *M. eriolepidis* the puparia were distinctly orange, with the horns of the posterior spiracles surrounded by 20 to 25 rather irregular bulbs (Spencer 1966).

Woolly thistle is widely distributed but local in England and Wales north to County Durham (Stace 1991). It seems to be particularly frequent in Somerset, Gloucestershire and Wiltshire. It is notable that *Terellia longicauda* (Meigen), a tephritid fly also only known to develop in woolly thistle, has its British distribution centred on these three counties (Clemons 1996).

#### *Cerodontha spinata* (Groschke, 1954)

During 2001 I surveyed woodland at Folly Farm, Somerset for the Avon Wildlife Trust. Amongst the numerous Diptera collected on 28 September was a species of *Cerodontha* subgenus *Dizygomyza*, which would not run satisfactorily through the key by Spencer (1972). Unfortunately I had not noted this fly in the field so no host associations could be readily deduced. However, the wood contained much *Carex pendula*, *C. strigosa* and *C. sylvatica* but there was no *Juncus*, *Luzula sylvatica* or *Iris pseudacorus* and only a few plants of *Luzula pilosa*.

In March 2002 I returned to the site and searched likely host plants for mines. Several hours yielded just one occupied silvery mine in a leaf of *Carex sylvatica*, which was retained. From this an adult female emerged on 15 July, several weeks after being moved indoors.

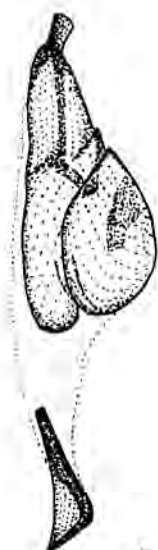
#### Identification

Using Spencer (1972) both specimens ran to couplet 6 readily but did not fit either choice well; the knees of the mid and hind legs are clearly yellow but cannot really be described as bright yellow. Taking the first option they run to couplet 11 which included *C. bimaculata* (Meigen) and *C. luctuosa* (Meigen), both of which are similar on external characters to my specimens but the site largely lacked the known host plants for both species. If one assumed the knees are bright yellow and go to couplet 12, again they do not fit either option; *C. suturalis* (Hendel) is too small while *C. iraeos* (Robineau-Desvoidy) lacks yellow on the abdomen.

Once the male was dissected it immediately became clear that it differed from all of the aforementioned species in the structure of the aedeagus (Figs 7-8). Using Spencer (1976) the results were the same as above; none of the genitalia illustrations fitted the specimen. Equally no satisfactory identification could be arrived at from the illustrations in Spencer (1990). I then took the male specimen to the University Museum Oxford where I consulted Nowakowski (1973). From the excellent genitalia illustrations in this work I was very quickly able to conclude that my specimen was *C. spinata*. The German key was translated for me by Adrian Pont and, although some characters were difficult to interpret, it did run to *C. spinata*. The genitalia are shown here in Figs 7-11.

**Figs 1-5. *Melanagromyza eriolepidis* Spencer, male genitalia: 1, aedeagus, left lateral view; 2, aedeagus – dorsal view; 3, 9th sternite; 4, ejaculatory apodeme; 5, epandrium, left lateral view; 6, epandrium, left caudal view.**





1



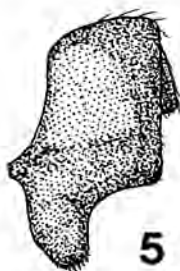
2



3



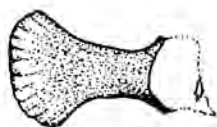
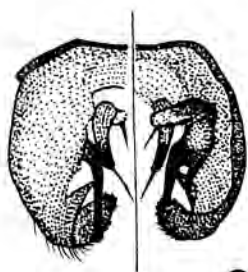
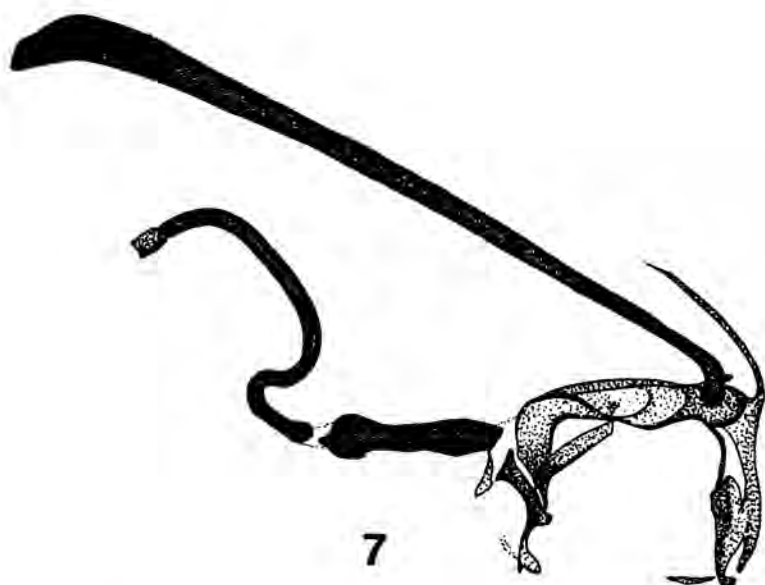
4

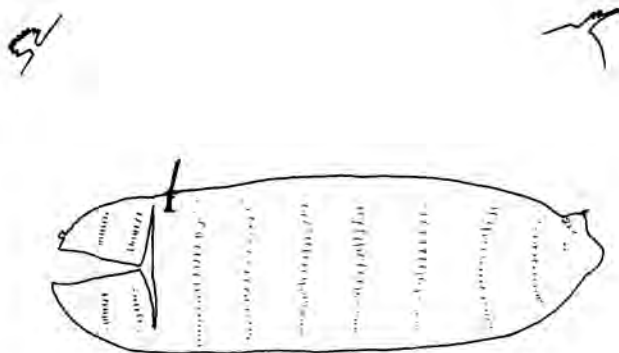


5



6





**Fig. 12.** *Cerodontha spinata* (Groschke), female puparium, lateral view.

In summary *C. spinata* is most similar in external characters to *Cerodontha bimaculata* but with the knees of mid and hind legs dull yellow rather than black. The male genitalia showed that the specimen is very different from *C. bimaculata*, resembling most closely those of *C. caricicola* (Hering), *C. morosa* (Meigen) and, especially, *C. luzulae* (Groschke).

The female reared in July 2002 differs from the male specimen in having a smaller first flagellomere, which in the male is enlarged rather more than seen in *C. luctuosa* but less than in *C. bimaculata*. Unfortunately, by the time the female had emerged, the mine had become too shrivelled to yield any useful information. At the time of collection the mine was noted to be starting about 2-3cm from the tip of the leaf and seemed to head straight for the base of the leaf, without any doubling back or branching. The larva was already close to the base of the leaf and when it pupated at the end of its mine it was not visible without parting the leaves. The puparium (Fig. 12) is pale translucent yellowish-brown, rather flattened and tapering rearwards.

#### Acknowledgements

I am very grateful to David Henshaw for confirming the identity of the *Melanagromyza eriolepidis* specimens and to John Ismay, Adrian Pont and Peter Chandler for their help with identifying *Cerodontha spinata*.

#### References

Clemons, L. 1996. *A provisional atlas of the Tephritidae (Diptera) of Britain and Ireland*. 1-42. Dipterists Forum.

**Figs 7-11.** *Cerodontha spinata* (Groschke), male genitalia: 7, aedeagus and aedeagal apodeme - left lateral view; 8, aedeagus, ventral view; 9, epandrium, left caudal and internal views; 10, ejaculatory apodeme; 11, 9th sternite.

- Nowakowski, J.T. 1973. Monographie der europäischen Arten der Gattung *Cerodontha* Rond. (Diptera, Agromyzidae). *Annales Zoologici, Warszawa* **31**, 1-327.
- Spencer, K.A. 1966. A revision of European species of the genera *Melanagromyza* Hendel and *Hexomyza* Enderlein, with a supplement on the genus *Ophiomyia* Braschnikov. *Beiträge zur Entomologie* **16**, 3-60.
- Spencer, K.A. 1972. Diptera, Agromyzidae. *Handbooks for the Identification of British Insects*. **10**(5g), 1-136. Royal Entomological Society of London.
- Spencer, K.A. 1976. The Agromyzidae (Diptera) of Fennoscandia and Denmark. *Fauna Entomologica Scandinavica* **5**, 1: 1-304.
- Spencer, K.A. 1990. Host specialisation in the World Agromyzidae (Diptera). *Series Entomologica*, vol. **45**, 1-444. Kluwer Academic Publishers.
- Stace, C. 1991. *New flora of the British Isles*. 1-1225. Cambridge.

### Another fungus association for *Meoneura neottiophila* Collin (Diptera, Carnidae) –

I previously recorded the occurrence of males of *Meoneura neottiophila* Collin (Carnidae) on caps of the fungus *Pleurotus*, together with both sexes of *Acartophthalmus bicolor* Oldenberg (Acartophthalmidae) (1998. *Dipterists Digest (Second Series)* **5**, 29). On 5 August 2002 I visited Lackham Park, the grounds of the Wiltshire Agricultural College. At the edge of Plucking Grove Wood, an area of mixed broadleaved woodland on a north facing slope to the River Avon, I noted a drying bracket of *Polyporus squamosus* protruding from the cavity of a small rot hole a little over 2 metres from the base of a standing live sycamore *Acer pseudoplatanus*, close to the drive to Lackham College. Many small flies were observed to be alighting on this fungus and a sample taken consisted mainly of *M. neottiophila* (11♂ taken). Again all the individuals collected were males, tending to confirm that they were using the fungus as an assembly site, possibly associated with courtship behaviour although again no females could be found in the vicinity.

*M. neottiophila* is known to develop in bird nests, but there is one recorded fungus association, which I overlooked in my previous note, i.e. with the bolete *Leccinum scabrum* (W. Hackman and M. Meinander. 1979. Diptera feeding as larvae on macrofungi in Finland. *Annales Zoologici Fennici* **16**, 50-83).

Other Diptera visiting this bracket of *Polyporus squamosus* were *Leiomyza dudai* Sabrosky (Asteiidae) (5♂ taken) and *Drosophila funebris* (Fabricius) (Drosophilidae), both regularly associated with a wide range of fungi that have begun to decay. Also taken were females of *Forcipomyia pulchrithorax* Edwards (Ceratopogonidae) but these were considered likely to have been attracted to the detritus in the rot hole, as it is normally associated with decaying wood rather than fungi.

I would like to thank Roger Martindale for granting me permission to record Diptera at Lackham Park and for introducing me to this interesting site – **PETER CHANDLER**, 606B Berryfield Lane, Melksham, Wilts SN12 6EL.

## ***Minettia plumicornis* (Fallén, 1820) (Diptera, Lauxaniidae), new to Norway**

LITA GREVE

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### **Summary**

*Minettia plumicornis* (Fallén, 1820) (Lauxaniidae) is added to the Norwegian Diptera list.

The lauxaniid fly *Minettia plumicornis* (Fallén, 1820) is here recorded as new to Norway. Seven males and three females were collected at Ognå in Hå community, Rogaland province (EIS 3) on 8 July 1986 by Arild Fjeldså. Ognå is located in southern Norway approximately 58°E 30°N, south of the town of Stavanger. The locality is probably dune ridge or high beach since the material from Ognå was collected among *Ammophila arenaria* and *Elymus* species. Ognå is situated at the southern end of the long sandy beach of Jæren. Further north along the Norwegian coast there are few sandy beaches, and the sandy beach at Ognå is also quite a long distance from sandy beach areas further east along the Norwegian coast.

*M. plumicornis* is recorded from Denmark and Sweden (Ardö 1957), but not from Finland (Hackman 1980). Krogerus (1932), however, recorded *M. plumicornis* from a group of islands south of the Finnish mainland, today outside the Finnish territory. *M. plumicornis* is known from the British Isles north to Scotland (Collin 1948). Shatalkin (1998) noted the distribution as European, in Russia recorded from the Moscow province south to Crimea and Caucasus. The Norwegian record is from the northernmost part of the distribution area.

Ardö (1957) regarded *M. plumicornis* as a species bound to the marine shore dune ecosystem, especially to the dune ridge and the dune heath. This fits well with the locality at Ognå. However, further south in Europe *M. plumicornis* also occurs inland (B. Merz pers. comm., Shatalkin 1998).

*M. plumicornis* was described by Fallén (1820). It is a yellow coloured species with plumose arista and partly black palpi. There are four longitudinal rows of acrostichal setulae dorsally on the thorax. The genitalia of both males and females offer good characters, see Remm and Elberg (1979). Not much is known of the juvenile stages of *M. plumicornis* as the life history has not been described. The larvae are probably saprophagous like larvae of other Lauxaniidae, developing in thin layers of organic matter found inside the dune ridge.

Including *M. plumicornis* only five species of *Minettia* have hitherto been recorded from Norway compared to nine species listed in a recent checklist from Denmark (Merz *et al.* 2000).

### **Acknowledgements**

I thank Dr. Andrew Whittington, Geology and Zoology Department, National Museums of Scotland, Edinburgh, for information on material of *Minettia plumicornis* in the museums' collections.

### **References**

- Ardö, P. 1957. Studies in the marine shore dune ecosystem with special reference to the Dipterous fauna. *Opuscula Entomologica, Supplement* 14, 1-225.
- Collin, J. E. 1948. A short synopsis of the British Sapromyzidae (Diptera). *Transactions of the Royal entomological Society of London* 99, 225-242.
- Fallén, C. F. 1820. *Ortalides Sveciae*. Lundae. 34 pp.

- Hackman, W. 1980. A check list of the Finnish Diptera. II. Cyclorrhapha. *Notulae Entomologicae* **60**, 117-162.
- Krogerus, H. 1932. Über die Ökologie und Verbreitung der Arthropoden der Triebssandgebiete an den Küsten Finnlands. *Acta Zoologica Fennica* **12**, 1-208.
- Merz, B., Greve, L., Petersen, F. T. and Papp, L. 2001. Fam. Lauxaniidae. Pp. 199 – 200. In Petersen, F. T. and Meier, R. (Eds). A preliminary list of the Diptera of Denmark. *Steenstrupia* **26**, 119-276.
- Remm, E. and Elberg, K. 1979. Terminalia of the Lauxaniidae (Diptera) found in Estonia, Latvia and Lithuania. *Dipteroloogilisi Uurimusi, Eesti NSV Teaduste Akadeemia*, 66 – 117.
- Shatalkin, A. 1998. Palearctic fly species from the genus *Minettia* (Diptera, Lauxaniidae). *Zoologicheskii Zhurnal* **77**, 809-917 (English translation in *Entomological Review* **78**, 952-961).

**Additions to the checklist of Agromyzidae (Diptera)** - Two omissions of Agromyzidae from the British checklist have come to light and are reported here.

*Napomyza carotae* Spencer, 1966. This was originally described from material reared in Holland and Switzerland, but it was later reported from Norfolk in 1974 (Jones, O.T. 1975. Damage to carrots by larvae of *Napomyza carotae* Spencer (Diptera: Agromyzidae). *Plant Pathology* **24**, 62) and there is material from this record in the Natural History Museum, London. K.A. Spencer (1966. A clarification of the genus *Napomyza* Westwood (Diptera, Agromyzidae). *Proceedings of the Royal entomological Society* (B) **35**(3-4), 29-40) provided a description and drawings of the male genitalia.

*Phytomyza robustella* Hendel, 1936, new name for *P. robusta* Hendel, 1935, a homonym of *robusta* Meunier, 1905 (*Napomyza* (*Phytomyza*)). Specimens have been found, labelled by K.A. Spencer, amongst accession material in the Hope Insect collections, Oxford University Museum. This species develops in the petiole of rough hawk'sbeard *Crepis biennis*. No English description is currently available, although it is generally considered to closely resemble *P. affinis* Fallén but is noticeably larger. G.C.D. Griffiths (1964. The Agromyzid Fauna of Iceland and the Faroes, with Appendices on the *Phytomyza milii* and *robustella* Groups (Diptera, Agromyzidae). *Entomologiske Meddelelser* XXXII, 393-394) published a drawing of the male genitalia - **D.J. de C. HENSHAW**, 34 Rounton Road, Waltham Abbey, Essex EN9 3AR

## ***Agathomyia sexmaculata* (von Roser) (Diptera, Platypezidae) new to Britain and some other recent records of Platypezidae**

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### **Summary**

*Agathomyia sexmaculata* (von Roser, 1840) is added to the British list. New records are given for several other species, including three additional records of *Paraplatypeza bicincta* (Szilády), first recorded as British in 2001. All known British records are presented of *Agathomyia cinerea* (Zetterstedt, 1852) and variation in the female colour pattern is discussed.

The discovery of two additional species of Platypezidae for the British fauna in 2001 (Ismay 2002, Chandler 2002) was unexpected, so soon after the publication of the European revision of this family (Chandler 2001). Even more surprisingly a further species, *Agathomyia sexmaculata* (von Roser, 1840), was newly recorded from Britain in the autumn of 2002.

The last locality visited on the Dipterists Forum autumn field meeting in Norfolk was Thompson Common, a Norfolk Wildlife Trust Reserve renowned for its pingos and mostly comprising a mosaic of wooded and grassland areas grazed by Shetland ponies. Following the heavy rain of the previous day, which had ended about two months of drought in the county, it was a surprisingly good day for recording Platypezidae. A single female of *A. sexmaculata* was swept in the shady woodland in the ungrazed area to the west of the more open habitats at the north end of the Common (TL9396). It was unfortunately not recognised in the field and the precise location was not recorded, so no clue to its unknown biology was obtained. This species is scarce but widespread in Western Europe, including Holland and Denmark.

The female of *sexmaculata* is easily recognised as it is predominantly light grey with dark markings on the abdomen, principally a pair of dorsolateral black roughly triangular markings set on the hind margin of tergites 3-4, not reaching the fore margin of these tergites in the British specimen; smaller dark patches may also be present in a similar position on tergite 5 (thus accounting for the specific name) but these are small and indistinct in the British specimen. The male is entirely dark coloured like several other species of the genus and is closest to *A. antennata* (Zetterstedt) and *A. collini* Verrall among British species; like *collini* it lacks strong setae on the shaft of the mid tibia and it differs from *collini* in the two strong setae on the mid first tarsomere being widely separated with the lower one in a median position while *collini* has two setae close together on the basal third. Both sexes may be determined using the keys provided by Chandler (2001).

Also at Thompson Common, *Platypeza consobrina* Zetterstedt and both species of *Protoclythia* Kessel, all known to develop in the honey fungus *Armillaria mellea*, were frequent, mainly females on foliage of hazel *Corylus* but aerial swarms of males were observed of *P. consobrina* and *Protoclythia rufa* (Meigen), both about 4-5 metres from the ground. *Platypeza consobrina* formed loose swarms, sometimes only two or three being apparent increasing to about a dozen, and occupying the space between trees where there were gaps in the canopy. A single swarm of five or six *P. rufa* was observed, flying around the terminal twigs of an overhanging branch.

On 9 October I had visited Bressingham, where in the estate attached to Bloom's Garden Centre, the galls caused by *Agathomyia wankowiczii* (Schnabl) on brackets of *Ganoderma applanatum* had been recorded in February 2002 by a bryological field meeting, the first record for East Anglia (Bull 2002). The site, a small poplar *Populus* copse near the River Waveney

(TM0780), was investigated and a good number of galled brackets were seen on a dead poplar, which had snapped off 2 metres from the ground during the 1987 gale. This will be reported on in more detail elsewhere, but during a few minutes sweeping of the area at one end of this copse, a female of *Seri obscuripennis* (Oldenberg) was caught, also a first record for East Anglia so this site would certainly be worthy of further investigation.

#### **British records of *Seri obscuripennis* (Oldenberg)**

Chandler (1974) added this species to the British list on a single female from Wokefield Common, Berkshire. Chandler (2001) referred to adults and puparia from the Sheep Leas, Surrey. In addition to these records, I have only seen two females in the Oxford University Museum collections, collected by John Ismay near Cothill, Berkshire on 11 September 1989 and 18 May 1994. The male has yet to be found in Britain. Ševčík (2001) recorded rearings of *S. obscuripennis* from *Polyporus badius* and *P. varius* in the Czech republic.

#### **New records of *Paraplatypeza bicincta* (Szilády)**

Another remarkable day for Platypezidae was 23 October 2002, the only entirely fine day during that week; it was sunny but cold and few fungus gnats were flying. Visits were made to Stonybrook Wood, a beech *Fagus* woodland at the southern end of Rotherfield Park (SU6830) and Waggoner's Wells (SU8534), mainly beech woodland around a valley with a stream and three ponds; both of these Hampshire woodlands were being surveyed for Diptera on behalf of Jonty Denton. At each of these sites a single female of *Paraplatypeza bicincta* (Szilády) was taken from hazel foliage, thus constituting the second and third British records for this species. At Stonybrook Wood it was the only platypezid recorded on this visit.

The first recorded British male of *P. bicincta* has also since come to my notice. Ivan Perry collected this specimen at King's Forest, Suffolk on 28 October. It was swept from the foliage of fir trees in an area of mixed woodland and was evidently sheltering there. This male, which has the genitalia exerted, has a wing length of 4.2mm, i.e. within the range stated by Chandler (2001) while the three British females examined are smaller, wing length 3.4-3.6mm.

#### **British records of *Agathomyia cinerea* (Zetterstedt)**

Also at Waggoner's Wells on 23 October a female of *Agathomyia cinerea* (Zetterstedt) was swept flying over low herbaceous vegetation near the edge of an area of alder *Alnus* woodland by the stream, above the series of ponds. Until recently, only one British male had been found of this species although probable females had been recorded at several sites in southern England. However, during September and October 2002 numbers of both sexes have been found at King's Forest, Suffolk by Ivan Perry. Most of these were collected by sweeping ferns in a narrow strip of birch *Betula* woodland, situated at the junction between an area of alder carr and pine *Pinus* plantations; three females, those collected on 30 September, 10 and 23 October were swept generally within the pine plantation at some distance from the broad-leaved woodland. The female found at West Stow on 30 September was in an area of alder and birch carr on the far side of West Stow Country Park, from the alder carr in King's Forest, which adjoins the Park.

Although the name *cinerea* had earlier appeared in the British literature, the true *cinerea* of Zetterstedt was first correctly recorded as British in checklist (Chandler 1998), the marked sexual dimorphism in the genus having led to misidentifications and incorrect associations of sexes. A female from Haugh Wood, Herefordshire, was exhibited at the 1998 BENHS Annual Exhibition (McLean 1999) and Gibbs (2001) recorded it from Somerset, but no other details of British records have previously been published. Separation of the female from that of *A. lundbecki* Chandler is not always easy as the amount of frosting on the yellow ground colour of tergites 1-2 and the extent of black marking on tergites 3-4 may vary (tergites 3-4 are usually entirely dark in *lundbecki*); *cinerea* may have the entire hind margin of tergite 5 narrowly black



as illustrated by Chandler (2001) or this marking more or less reduced. Most British females of *cinerea*, including those from Waggoner's Wells and King's Forest, have only a small lateral patch on each side of the hind margin. The finding of material with the sexes associated or the rearing of these species would be desirable to establish the extent of infraspecific variation. Males of these species may be identified from the keys provided by Chandler (2001), who listed British material assigned to *A. lundbecki*.

The British material assigned to *cinerea* is as follows:

BUCKINGHAMSHIRE: Burnham Beeches, near lakes (SU9585), 1♀ 4.x.1999, P.J. Chandler; HAMPSHIRE: Waggoner's Wells (SU8534), 1♀ 23.x.2002, P.J. Chandler; HEREFORDSHIRE: Pentoloe Glen (SO5837), 1♀ 10.x.1998, P.J. Chandler; Haugh Wood (SO5936), 1♀ 12.x.1998, I.F.G. McLean; HERTFORDSHIRE: Frithsden Beeches (TL0109), 1♀ 16.x.1997, P.J. Chandler; SOMERSET: Cleve Heronry (SY4666), 2♀ 4.x.2000, D.J. Gibbs; SUFFOLK: King's Forest (TL8071), 2♂ 13.ix.2002, 1♂ 19.ix.2002, 3♂ 29♀ 25.ix.2002, 5♂ 3♀ 29.ix.2002, 1♀ 30.ix.2002, 1♂ 3.x.2002, 1♀ 10.x.2002, 1♀ 23.x.2002, I. Perry; West Stow (TL8273), 1♀ 30.ix.2002, I. Perry; SURREY: Hankley Common, MOD comp. 38B (SU8841), 1♂ 5.ix.1992, J. Dobson.

### Acknowledgements

My thanks are due to Ivan Perry for kindly permitting me to include his records in this paper and he is to be congratulated for his success in adding to knowledge of the distribution of Platypezidae. I am grateful to Alec Bull for information on the finding of galls at Bressingham and to Stella Taylor of Blooms of Bressingham for kindly leading me to the actual site. I would like to thank Jason Bloom for permission to visit the Bressingham site and the Norfolk Wildlife Trust for permission to collect at Thompson Common. I am also indebted to Jonty Denton and the owners of the Hampshire sites, respectively Sir James Scott (Rotherfield Park) and the National Trust (Waggoner's Wells), for the opportunity to record there.

### References

- Bull, A. 2002. Flat-footed fly *Agathomyia wankowiczii* Schnabl, new to Norfolk. *Transactions of the Norfolk and Norwich Naturalists' Society* **35**, 28-30.
- Chandler, P.J. 1974. Additions and corrections to the British list of Platypezidae (Diptera) incorporating a revision of the Palaearctic species of *Callomyia* Meigen. *Proceedings of the British entomological and natural history Society* **7**, 1-32.
- Chandler, P.J. 1998. Platypezidae pp. 96-97. In Checklists of Insects of the British Isles (New Series). Part 1: Diptera (Incorporating a List of Irish Diptera). *Handbooks for the Identification of British Insects* **12**(1), i-xix, 1-234. Royal Entomological Society, London.
- Chandler, P.J. 2001. The Flat-footed Flies (Diptera: Opetiidae and Platypezidae) of Europe. *Fauna Entomologica Scandinavica* **36**, 1-276. Brill, Leiden.
- Chandler, P.J. 2002. *Paraplatypeza bicincta* (Szilády, 1941) (Diptera, Platypezidae) new to Britain. *Dipterists Digest (Second Series)* **9**, 23-24.
- Gibbs, D.J. 2002. Scarcer Diptera found in the Bristol Region in 1999, 2000 and 2001. *Dipterists Digest (Second Series)* **9**, 1-13.
- Ismay, J.W. 2002. *Microsania vrydaghi* Collart, 1954 (Diptera, Platypezidae) new to Britain. *Dipterists Digest (Second Series)* **9**, 22.
- McLean, I.F.G. 1999. [Exhibit at BENHS 1998 Annual Exhibition]. *British Journal of Entomology and Natural History* **12**, 168.
- Ševčík, J. 2001. Diptera (excluding Mycetophilidae s. str.) associated with fungi in Czech and Slovak Republics: a survey of rearing records from 1998-2000. *Acta Universitatis Carolinae Biologica* **45**, 157-158.

## Moth flies (Diptera, Psychodidae) in saltmarshes and five species new to Scotland

— In my account of the Scottish species of Psychodidae (2000, *Dipterists Digest (Second Series)* 7, 71-78) I cited a Scottish record of *Telmatoscopus similis* Tonnoir. The only previous British record was from Kent but this species is unusual among the British species of this family in developing in saltmarsh mud, so could easily be overlooked by those recorders who ignore this habitat. On 29 May 2002, during the Dipterists Forum summer field meeting based at Tarradale House, near Muir of Ord in Easter Ross, I visited Udale Bay (NH7065) on the Black Isle, Easter Ross, with Alan Stubbs. We had been informed that management changes were proposed to this area, which might have an adverse effect on the insect fauna. Around small pools at the junction between saltmarsh and adjoining grassland, near the ruined chapel, several psychodids were found to be flying and the sample taken proved to comprise 4♂ and 3♀ of *T. similis*, apparently the first British record since the previous Scottish find in 1955.

*T. similis* is not the only psychodid to occur in saltmarshes as confirmed by a visit on 1 June to the narrow fringe of saltmarsh on the estuary of the Beaulieu River as it enters the Beaulieu Firth, immediately below Tarradale House (NH5548). Here a male of *Paramormia ustulata* (Haliday in Walker) was collected. This species is apparently new to Scotland, although it is known to be widespread in England, Wales and Ireland according to P. Withers (1989, *Moth Flies*. Diptera: Psychodidae. *Dipterists Digest (First Series)* 4, 1-83), who also reported that it had been reared from eelgrass *Zostera* at marine localities and from mud of springs washed by seawater, as well as occurring in a range of freshwater aquatic habitats including farm ponds.

This field meeting was particularly productive of Psychodidae and remarkably provided new Scottish records of four other species. One of these, *Philosepedon humeralis* (Meigen), has been recorded previously but was indicated to require confirmation in my paper cited above. A male was collected in an alder *Alnus* wood (NH7065) adjacent to Udale Bay on 29 May. It is a common species in the south, developing in dead molluscs and occurring in gardens as well as woodland where it is often numerous on tree trunks, so will probably prove to be widespread in Scotland.

On 26 May at Loch Eye (NH8480), also in Easter Ross, the alder wood at the eastern end of the Loch produced males of *Telmatoscopus consors* (Eaton) and *T. longicornis* (Tonnoir), both new to Scotland. Withers (*op. cit.*) recorded the first from three counties in England and Wales and the second from Norfolk and Ireland. P. Withers and J.P. O'Connor (1992, A preliminary account of the Irish species of moth fly (Diptera: Psychodidae). *Proceedings of the Royal Irish Academy* (B) 92(5), 61-77) gave Irish records of both species. Then, on 31 May at Migdale Wood, Sutherland, sweeping in the birch *Betula* and alder wood fringing the Spinningdale Brook (NH6590) produced a female of the genus *Sycorax* Haliday in Curtis. This genus is new to Scotland but males are necessary for specific determination, leaving another quest for a further visit to this very rich site.

In addition to the above *Tonnoiriella pulchra* (Eaton) and *Szaboella hibernica* (Tonnoir) were refound at Glen Coiltie (NH4928), Inverness-shire, on 28 May and *S. hibernica* was also found by the River Glass (NH3736) on the same day and at Torboll Wood (NH7498), Sutherland, on 26 May. *Pericoma cognata* Eaton was recorded at the Udale Bay alder wood and at Glen Coiltie — **PETER CHANDLER**, 606B Berryfield Lane, Melksham, Wilts SN12 6EL.

## Scuttle Flies (Diptera, Phoridae) from a large rothole in an oak tree in England

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### Summary

Diptera were sampled from water traps placed in a large rothole in a mature *Quercus petraea* located on a Lincolnshire estate. The Phoridae represent the most species rich family sampled. A total of 475 specimens were taken belonging to 19 species. The Phoridae recovered from the material are described in this paper. Aspects of the ecology of these species in relation to the rothole are discussed.

### Introduction

On the Hagnaby Estate situated about 8km from Spilsby in Lincolnshire (Grid ref. TF346626) there stands a mature oak tree, *Quercus petraea*. Its girth is 410cm dbh. Using the method advocated by White (1994), this allows an estimate of its age of about 120 years. On its east side there is a large water-filled rothole at a height of about 1.8m. In March 1998 the water surface measured 72cm x 40-60cm, with a maximum depth of 64cm. The sapwood is exposed for most of the inside of the cavity, but the bark is intact around and immediately inside the hole. The sapwood is riddled with beetle exit holes, there is a small sap run near the top and a sodden capillary zone for a few centimetres above the water surface. No fungi or animal nests were found within the cavity or elsewhere on the tree. The lip of the cavity is tannin stained from periodic overflow, which has allowed a development of green algae and mosses on the trunk below the lip.

From 1996 to 1998 the invertebrate fauna of this rothole was intermittently sampled, mainly by means of small water traps floated on the water surface during 1996 and 1997. These traps were operated in the months of April to October. The Diptera were the most abundant order obtained in all samples combined, being represented by 35 families. The five most species rich families were the Phoridae (19 species), Psychodidae (11 species), Dolichopodidae (10 species), Hybotidae (9 species) and Muscidae (9 species). In this paper we report on the 475 specimens of Phoridae that were obtained in the water traps set in the rothole.

### Results

Nineteen species of scuttle fly were recorded in our rothole samples. Of the specimens 247 (52%) belonged to the rarely caught *Megaselia latipalpis* (Schmitz). The numbers of the sexes were not significantly different, there being 122 females and 125 males. Such a sex ratio strongly suggests that this species was breeding in the rothole, as such data as are available (Disney 1994) indicate that males of *Megaselia* species are more prone to dispersal than females. This species has hitherto been regarded as an uncommon woodland species. It has previously been recorded from Cambridgeshire, Oxfordshire and Suffolk in the months of June and August (Disney 1989). In our rothole samples *M. latipalpis* was obtained in every month from April to October, with the largest numbers being in September and October. In the case of the Oxfordshire records these were obtained from the canopies of oak trees, but are included in the category "other *Megaselia* spp." in the table of species thus procured (Disney 1994 - Table 7.4). A gravid female was found to have 12 nearly mature eggs, which measure about 0.50 x 0.15 mm. The female of this species has not been described. This is remedied below.

*Megaselia ciliata* (Zetterstedt), a widespread and common species in Britain, was represented by 153 specimens (32.2%). Overall the sex ratio was 0.7 males:1 female (63:90). However in September 1996 the ratio was 0.9:1 (40:43) but in the immediately following October it had fallen to 0.5:1 (23:43). These data suggest that this species was breeding in the rothole, with the males being under-represented due to a greater tendency to dispersal from the rothole. The larvae of this species are predators of slug eggs, mainly of species of *Deroceras* but also of *Arion* (Disney 1977 and 1979), with the eggs of *D. reticulatum* (Müller) being specifically recorded (Ayre 2002). A single male of the related scuttle fly *M. aequalis* (Wood) was also recorded in the rothole. This contrasts with these two species being almost equally abundant in emergence traps set over the soils of lowland pastures in England (Disney *et al.* 1981). Its larvae also feed on *Deroceras* slug eggs, including those of *D. laeve* (Müller) and *D. reticulatum* (Robinson and Foote 1968, Ayre 2001). Ayre (2001, 2002) noted that the *D. reticulatum* hatching peaks in England are May and September and that the adult emergence peaks reported for *M. aequalis* (Disney *et al.* 1981) were May and August, and also an August peak for *M. ciliata*, thus suggesting a close synchronisation between newly emerged flies and the availability of slug eggs. Both species are common not only in emergence traps set over soil in pastures (Disney *et al.* 1981) but also in various crops (Disney 1994). However, in emergence traps, attached to the trunks and branches of woodland trees in Germany, *M. ciliata* was significantly more abundant than *M. aequalis* (Büchs 1983 and 1988).

The third most abundant species was *Megaselia sylvatica* (Wood), with 21 (4.4%) specimens, which were all males. The lack of females suggests that this species was not breeding in the rothole. Indeed, the larvae of this species are found in the sporophores of a range of fungi (Disney 1994).

The next commonest species was represented by 15 (3.2%) males of the common and widespread *Anevrina thoracica* (Meigen), obtained in the months of May, July, August and October. Again the lack of females suggests that this species was not breeding in the rothole. Its larval habits are not known, but adults have been recorded in mole nests and rodent burrows, visiting flowers of Apiaceae, feeding from vertebrate carrion, and mating on tree trunks (Disney 1994). They are common in emergence traps set over soil in pastures (Disney *et al.* 1981), some crops and in woodland (Disney 1994).

The next most frequent species were 8 (1.7%) *M. rufipes* (Meigen) and 7 (1.5%) *Megaselia giraudii* (Egger), both sexes being procured in each case. Both are common and widespread species whose larvae feed on a broad range of decaying organic plant and animal derived materials (Disney 1994). These were, therefore, both likely to have developed in the rothole; but opportunistically with respect to a range of alternative situations available in the locality.

*Megaselia pleuralis* (Wood) and *M. pygmaea* (Zetterstedt) were each represented by 4 (0.85%) specimens. *M. ignobilis* (Schmitz) and *M. simplex* (Wood) were each represented by 3 (0.65%) specimens and *M. altifrons* (Wood) by 2 (0.4%) specimens. Finally the following species were each represented by a single (0.2%) specimen - *Conicera floricola* Schmitz, *Diplonevra pilosella* Schmitz, *Megaselia aequalis* (Wood), *M. angusta* (Wood), *M. minor* (Zetterstedt), *M. scutellaris* (Wood), *M. spinicincta* (Wood) and *M. subconvexa* (Lundbeck). The occurrence of these species in the rothole is likely to have been largely fortuitous, in that any humid sheltered situation in which to rest would have been equally acceptable. Apart from the somewhat rare *M. simplex* and *M. subconvexa*, these species are all widespread, and most are common, in England.

#### ***Megaselia latipalpis* (Schmitz)**

*Aphiochaeta latipalpis* Schmitz, 1921: 326 (♂ only).

*Megaselia latipalpis* (Schmitz). Schmitz, 1927: 144.

This species was added to the British List relatively recently (Disney 1985). The modified ovipositor of the female (see below) would have caused this species to be assigned to *Plastophora* Brues, prior to the synonymy of that genus with *Megaselia*. In the key to these species by Colyer and Elberg (1969) the females of *M. latipalpis* will run to couplet 51, to *M. furcilla* Schmitz. This species is a synonym of *M. emarginata* (Wood) (Disney in press), whose female is immediately distinguished by its much larger antennae and its well developed cerci.

**Female.** Frons colour and chaetotaxy very similar to male. Third antennal segment only slightly smaller than that of male, and like it lacking SPS vesicles. Palp only about two thirds as broad as that of male and with at least three of the bristles longer than its greatest breadth. Proboscis with pale brownish yellow labrum about as wide as third antennal segment, and pale straw yellow labella a little larger than in male. Thorax similar to male, including chaetotaxy. Thus each side of scutum with a humeral, three notopleurals, an intra-alar, a postalar and a prescutellar dorsocentral bristle. Scutellum with an anterior pair of small hairs (at most as strong as those at rear of scutum) and a posterior pair of bristles. Abdominal tergites 1-7 brown with short hairs. T5-T6 as Fig. 1. T7 and terminalia modified to form an ovipositor as Fig. 2. Sternum 8 with an elongated median, round-ended, lobe extending rearwards. The hypoproct reduced to a minute lobe bearing two small hairs. The ovipositor sheath is evidently formed from T9/T10 and the epiproct fused into a single structure that is divided posteriorly into two elongated lobes bearing small hairs at their extremities. These hairs probably represent the remnants of the cerci (Fig. 3). Venter brownish yellow with fine hairs below segments 3-6. Internally Dufour's crop mechanism about 3x as long as greatest breadth and rounded behind. With four rectal papillae in contrast to male, which only has two. Front and middle leg similar to male, including all five fore tarsal segments having a posterodorsal hair palisade and the mid tibia near-dorsal palisade extending only about two thirds of its length or less. Hind femur with hairs below basal half not quite as long as in male, but still longer than anteroventral hairs of outer half. Hind tibia not modified at tip as in male (Fig. 394 in Disney 1989), but as in latter with all spinules of apical comb simple. Wing and haltere similar to male.

## Discussion

Previous studies of rothole faunas in Britain (e.g. Keilin 1927, Macan and Tutin 1932, Kitching 1971) are restricted to the aquatic element of the faunas or have only partly covered the non-aquatic species. This emphasis partly reflected the limitations of the available taxonomic keys at the time. The study by Snow (1958) of the fauna of a wet stump cavity in a sweet gum in Alabama (USA) provided a closer parallel to the present report. He recorded 45 taxa compared with the more than 120 species of Diptera alone obtained in the present study. However, many of our records, as is evident from the list of scuttle flies above, are merely casual visitors to the rothole rather than species breeding in it. The tramp species and polyphagous saprophage *M. scalaris* (Loew) has been reported from treeholes in North America (Copeland 1989), but this species is only facultatively aquatic (Disney 1994). No aquatic phorid species have been reported in water filled tree holes in Europe, in contrast to the rich fauna of aquatic Phoridae in phytotelms in the Oriental Region (Disney 1991, 1993, 1995a and b; Kitching 2000).

Of the two principal species seemingly breeding in our rothole, while the larvae of *M. ciliata* are known to prey on slug eggs the habits of the larvae of *M. latipalpis* remain unknown. However we can attempt some inferences from the available data. The modifications of the ovipositor segments are characteristic of parasitoid species (Disney 1994). Furthermore, its eggs are about 3.5 x as long as the greatest breadth, which means they are relatively long and slender compared with typical *Megaselia* eggs. Thus the eggs of both *M. halterata* (Wood), whose larvae are fungivores, and *M. scalaris* (Loew), whose larvae are generalised saprophages, are only about 2.6 x as long as broad (Disney 1994). By contrast the eggs of parasitoid species are

variously modified, frequently being somewhat elongated. An extreme case is the ant-parasitoid *M. persecutrix* Schmitz, whose eggs are about 4.6 x as long as broad (Disney and Maschwitz 2000). The eggs of *M. latipalpis* are therefore intermediate between this extreme and typical *Megaselia* eggs, but their dimensions are supportive of the hypothesis that this species has parasitoid larvae. Recorded batch sizes, for the number of eggs matured in each ovarian cycle, by species of *Megaselia* range from 2 to 60 (Disney 1994). Thus a batch size of 12 for *M. latipalpis* is lower than is typical. What can we infer from this observation?

A low batch size would seem to be normally associated with two distinct phenomena. In some cases it is correlated with refined predatory or parasitic larvae, following accurate placement of each egg in relation to the target host or prey. The high chance of success compensates for risks associated with a concentrated investment. In the extreme case of the con flies *Diplonevra mortimeri* Disney and *D. watsoni* Disney parasitising termites, the one and only egg matured at one time is inserted into the comatose termite, which is then concealed with soil particles and guarded (Disney 1986). By contrast *Misotermes exenterans* scatters large numbers of eggs in its host-termite's nest, relying on chance encounters by the soldier termites, their target hosts (Kalshoven 1938).

The other phenomenon associated with a reduced batch size is accelerated larval development and curtailment of the free-living larval stage. Keilin (1916) mentioned facultative ovoviviparity in some species of *Megaselia*, that is to say, the retention of eggs, beyond the normal time for oviposition, until they are ready to hatch very soon after being laid. Schmitz (1938) cited this observation, noting that an abbreviated incubation period for the egg indicates the occurrence of such facultative ovoviviparity. It is probable that obligate ovoviviparity is the norm in some Phoridae, especially some species of *Megaselia*. There is, as yet, no evidence of viviparity (i.e. the deposition of larvae rather than eggs) in any scuttle flies. Meier *et al.* (1999) recently reviewed the topic of ovoviviparity and viviparity in Diptera.

In some cases probably both phenomena are involved in batch-size reduction, as the data for the genus *Puliciphora* Dahl tend to suggest. Thus the polyphagous saprophage *P. togata* Schmitz matures only eight eggs at a time, compared with about two dozen in the polyphagous saprophage *P. borinquensis* Wheeler. This reduced batch size probably relates to the relatively large egg size and a rapid larval development. In the specialised predator *P. boltoni* Disney, whose adults live in the colonies of their ant hosts, and in *P. collinsi* Disney, almost certainly a parasitoid of termites, only four eggs are matured at a time (Disney 1988).

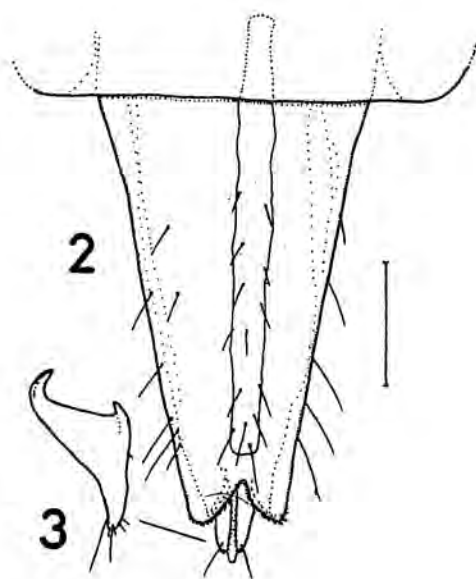
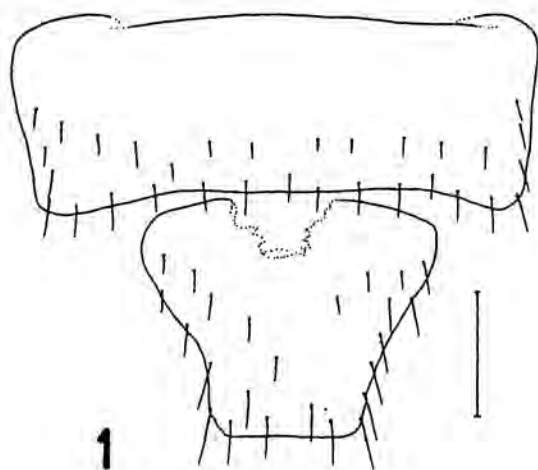
A third correlate of a low egg batch size is suggested by the case of the maritime species, *M. yatesi* Disney, which inhabits the voids in the first shingle ridge above high water mark. Its batch size of 2-8 eggs is probably related to a dearth of predators in this specialised habitat subjected to fluctuations in salinity (Disney 2002).

Of these three phenomena associated with a reduced egg batch size that of parasitoid habits is consistent with the modified ovipositor of *M. latipalpis*. The only other available data on the natural history of this species is the report of the crop contents of one of the females from an oak canopy near Oxford, which comprised detrital material that included numerous fungus spores (Disney 1994).

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**Fig. 1-3. *Megaselia latipalpis* female. 1, abdominal tergites 5-6. 2-3, abdominal terminalia: 2, segment 7 and rest of terminalia viewed from above, with ovipositor largely withdrawn; 3, ovipositor sheath viewed from left side, with dorsal face to right. Scale bars 0.1mm**





## References

- Ayre, K. 2001. A new slug host for *Megaselia aequalis* (Wood) (Dipt., Phoridae). *Entomologist's monthly Magazine* **137**, 27-28.
- Ayre, K. 2002. *Megaselia ciliata* (Zetterstedt) (Dipt., Phoridae) attacking eggs of *Deroceras reticulatum* (Muller) (Gastropoda: Limacidae). *Entomologist's monthly Magazine* **138**, 17-18.
- Büchs, W. 1983. Jahresperiodische Aktivität und Wechselbeziehungen von Arthropoden aus der Stammregion eines Hartholzauenwaldes (Fraxino-Ulmetum). *Verhandlungen der deutschen Zoologischen Gesellschaft* **1983**, 210.
- Büchs, W. 1988. Stamm- und Rinden-zoozönosen verschiedener Baumarten des Hartholzauenwaldes und ihr Indikatorwert für die Früherkennung von Baumschäden. Rheinische Friederich-Wilhelms-Universität (Ph.D. Thesis), Bonn.
- Colyer, C.N. and Elberg, K. 1969. New data on Phoridae (Diptera). *Eesti NSV Teaduste Akad. Toim. (Biol.)* **18**, 154-169.
- Copeland, R.S. 1989. The insects of treeholes of Northern Indiana with special reference to *Megaselia scalaris* (Diptera: Phoridae) and *Spilomyia longicornis* (Diptera: Syrphidae). *The Great Lakes Entomologist* **22**, 127-132.
- Disney, R.H.L. 1977. A further case of a scuttle fly (Dipt., Phoridae) whose larvae attack slug eggs. *Entomologist's monthly Magazine* **112**(1976), 174.
- Disney, R.H.L. 1979. Natural history notes on some British Phoridae (Diptera) with comments on a changing picture. *Entomologist's Gazette* **30**, 141-150.
- Disney, R.H.L. 1985. Records of scuttle flies (Diptera: Phoridae) from Flatford Mill, including two species new to Britain. *Transactions of the Suffolk Naturalist's Society* **21**, 13-17.
- Disney, R.H.L. 1986. Two remarkable new species of scuttle-fly (Diptera: Phoridae) that parasitize termites (Isoptera) in Sulawesi. *Systematic Entomology* **11**, 413-422.
- Disney, R.H.L. 1988. Biology and taxonomy of Old World *Puliciphora* (Diptera: Phoridae) with descriptions of nine new species. *Oriental Insects* **22**, 267-286.
- Disney, R.H.L. 1989. Scuttle Flies - Diptera Phoridae Genus *Megaselia*. *Handbooks for the Identification of British Insects* **10**(8), 1-155. Royal Entomological Society of London.
- Disney, R.H.L. 1991. The aquatic Phoridae (Diptera). *Entomologica Scandinavica* **22**, 171-191.
- Disney, R.H.L. 1993. New species of aquatic Phoridae (Diptera) from Malaysia. *Aquatic Insects* **15**, 149-158.
- Disney, R.H.L. 1994. *Scuttle Flies: The Phoridae*. 467 pp. Chapman & Hall, London.
- Disney, R.H.L. 1995a. Further new species of aquatic Phoridae (Diptera) from Malaysia and Brunei. *Aquatic Insects* **17**, 205-213.
- Disney, R.H.L. 1995b. A new species of aquatic fly (Diptera: Phoridae) from Temengor Forest Reserve, Hulu Perak, Malaysia. *Malayan Nature Journal* **48**, 271-279.
- Disney, R.H.L. 2002. A new species of maritime scuttle fly (Dipt., Phoridae) from East Sussex. *Entomologist's monthly Magazine* **138**, 19-22.
- Disney, R.H.L. in press. Revisionary notes on European Phoridae (Diptera). *Bonner zoologisches Beiträge*.
- Disney, R.H.L., Henderson, I.F., Perry, J.N. and Clements, R.O. 1981. Phoridae (Diptera) from English pasture soils. *Pedobiologia* **22**, 366-378.
- Disney, R.H.L. and Maschwitz, U. 2000. Observations on *Megaselia persecutrix* (Diptera: Phoridae) in relation to its host *Camponotus gigas* (Hymenoptera: Formicidae). *Sociobiology* **36**, 585-590.
- Kalshoven, L.G.E. 1938. Weiteres über das Benehmen der *Misotermes* abdominal larven und der Myiagenen. *Entomologische Mededeelingen van Nederlandisch-Indië* **16**, 395-7.
- Keilin, D. 1916. Sur la viviparité chez les Diptères et sur les larves de Diptères vivipares.



- Archives de Zoologie Expérimentale et Générale, Paris* **55**, 393-415.
- Keilin, D. 1927. Fauna of a horsechestnut tree (*Aesculus hippocastanum*). Dipterous larvae and their parasites. *Parasitology* **19**, 358-374.
- Kitching, R.L. 1971. An ecological study of water-filled tree-holes and their position in the woodland ecosystem. *Journal of Animal Ecology* **40**, 281-302.
- Kitching, R.L. 2000. Food Webs and Container habitats, Cambridge University Press, Cambridge
- Macan, T.T. and Tutin, T.G. 1932. A note on the rot-holes in horsechestnut trees. *Parasitology* **24**, 283.
- Meier, R., Kotrba, M. and Ferrar, P. 1999. Ovoviviparity and viviparity in the Diptera. *Biological Reviews* **74**, 199-258.
- Robinson, W.H. and Foote, B.A. 1968. Biology and immature stages of *Megaselia aequalis*, a phorid predator of slug eggs. *Annals of the Entomological Society of America* **61**, 1587-1594.
- Schmitz, H. 1921. Neue europäische *Aphiochaeta*-Arten IV (Phoridae, Dipt.). *Entomologische Berichten, Amsterdam* **5**, 319--327.
- Schmitz, H. 1927. Revision der Phoridgattungen, mit Beschreibung neuer Gattungen und Arten. *Natuurhistorisch Maandblad* **16**, 30-40, 45-50, 59-68, 72-79, 92-100, 110-116, 128-132, 142-148, 164, 176.
- Schmitz, H. 1938. Phoridae. In Lindner E (Ed.). *Die Fliegen der palaearktischen Region* **4**(33) (Lieferung 123), 1-64.
- Snow, W.E. 1958. Stratification of arthropods in a wet stump cavity. *Ecology* **39**, 83-88.
- White, J. 1994. Estimating the age of large trees in Britain. *The Forestry Authority. Research Information Note* **250**.

## Why are there so few British specimens of *Periscelis nigra* (Zetterstedt) (Diptera, Periscelididae)?

- *Periscelis nigra* (Zetterstedt) was reported as new to Britain by J.E. Collin (1911. *Entomologist's monthly Magazine* 47, 230), based on a specimen taken by C.G. Lamb at Nethy Bridge in June 1905. This specimen is in the collection of the University Museum of Zoology, Cambridge. The label is printed and reads "Nethy Bridge, C.G. Lamb, 1905"; "6" has been added in pencil before "1905" to indicate the month. There is another specimen of *P. nigra* in the Verrall-Collin collection in the University Museum, Oxford from the same period and also from Strathspey; the label in this case reads, "Spey Bridge, Grantown, vi.05, C.G. Lamb".

Lamb spent the period from 14 June to 1 July 1905 in the company of Col. J.W. Yerbury collecting in Strathspey. An entry in Yerbury's diary raises some doubt about the place of capture of one of Lamb's specimens, although it is not clear which one. On 24 June 1905, Yerbury wrote, "went to Ballindalloch by 9.30 train and returned by 4.30 – bright and fine did no good except that Lamb got *Periscelis* at a decaying beech" (Rotheray, G.E. 1997. *Dipterists Digest (Second Series)* 4, 93). So, as well as indicating that Ballindalloch, rather than Nethy Bridge or Spey Bridge, was one of the *P. nigra* sites, Yerbury provides a precise date and some information on the microhabitat. Although Yerbury does not say which *Periscelis* species Lamb caught, no other species is represented by Scottish specimens in the Cambridge collection, where most of Lamb's material is housed. Unless Lamb took a third specimen of *P. nigra*, indications are that he was mistaken about one of the sites.

The only other British specimens of *P. nigra* appear to be two specimens in the Natural History Museum, London, which are mounted together. The data label reads: "Bred from tree sap, Sheffield, 28.vi.1933, Miss W Forest".

*P. nigra* is known from Sweden, Finland, Germany and the north west of the former Soviet Union. Larvae taken in Sweden were found in sap exuding from wounds in broadleaved trees, mainly wych elm (*Ulmus glabra*), but also horse chestnut (*Aesculus hippocastanum*) and beech (*Fagus sylvatica*) (Andersson, H. 1999. *Entomologisk Tidskrift* 120, 169-183). An as yet undescribed subspecies is known from Hungary, mainly from elm (*Ulmus campestris*), but also from white poplar (*Populus alba*) and oak (*Quercus* species) (Mathis, W.N. and Papp, L. 1998. Family Periscelididae in Papp, L. and Darvas, B. (Eds) *Contributions to a Manual of Palearctic Diptera* Volume 3.).

Over the past three years, I have found adult *P. nigra* in Leith, Edinburgh, on or adjacent to the sappy overflow from a rot hole in elm (*Ulmus procera*). I have also taken a *Periscelis* larva moving near the surface of this sappy material. Unfortunately the larva died. Its identity remains uncertain for the moment because there appears to be no published description of the larva of *P. nigra*.

The tree containing the rot hole is one of a small group on a disused railway line, now a walkway, in Leith. The boundary walls of the walkway separate it from houses on one side and a hospital on the other. The rot hole is 2.4 metres above the level of the tree base and has an opening of approximately 70mm by 100mm. The rot hole has formed where a branch has broken off. On the opposite side of the tree, from the base to a height of 2.1 metres, there is exposed an extensive area of rotten sapwood and heartwood. The rot hole and associated sap run (overflow) support a range of flies normally associated with this microhabitat: *Sylvicola cinctus* (Fabricius) (Anisopodidae), *Mycetobia pallipes* Meigen (Mycetobiidae), *Systemus pallipes* (von Roser) (Dolichopodidae), *Brachyopa insensilis* Collin (Syrphidae), *Aulacigaster leucopeza* (Meigen) (Aulacigastridae), *Phaonia cincta* (Zetterstedt) (Muscidae) (Malloch Society, unpublished results).

Dates for *P. nigra* adults were as follows: 1♂, 15 June 1999; 1♀, 12 June 2000; ♂♂, 14, 18 and 20 June 2001. The *Periscelis* larva was taken on 24 September 1999. Although these

dates suggest an established population, there are signs that the conditions in the rot hole are changing: over the 2001-02 winter period, there appears to have been no sap flowing in or from the rot hole; any moisture has come from rainwater running down the trunk. Because of the position of the rot hole, rainfall has to be quite heavy and prolonged for the water to reach it; and the shallowness of the rot hole means that not much water is retained. The cumulative effect has been that the rot hole and overflow have been dry for much of the winter.

*P. nigra* is categorised as RDB1 by D.B. Shirt (Ed.) (1987. *British Red Data Books: 2. Insects*. Nature Conservancy Council, Peterborough.) and by S. Falk (1991. *A review of the scarce and threatened flies of Great Britain (Part 1)*. Research and survey in nature conservation No. 39. Nature Conservancy Council, Peterborough.). In Leith the fly appears to be exploiting normal sap run material, suggesting that there is no obvious threat from a lack of suitable microhabitat. In addition, the existence of specimens from Strathspey and Sheffield (even although they were taken more than 60 years ago) indicate that it could have a wide distribution. Given these factors, it is surprising that there have not been more reports of *P. nigra*. It may simply be a case of under-recording due to very low populations, but until there are more records and we have a better understanding of any factors limiting the fly's distribution, for example conditions in the sap runs in which the larvae are found, RDBK would be a more appropriate category.

I am very grateful to the following for their assistance: László Papp for confirming the identity of the *P. nigra* specimen dated 18 June 2001; John Ismay for information about known British specimens and for details from the label on the specimen in the Verrall-Collin collection; Nigel Wyatt for details from the label on the specimens in the Natural History Museum; Russel Stebbings for details from the label on the specimen in the University Museum of Zoology, Cambridge and for information on other species of *Periscelis* in the museum collection; fellow members of the Malloch Society for the use of their rearing data; and last but not least, Graham Rotheray for practical help, encouragement and advice – **DAVID M. ROBERTSON**, 41 Claremont Road, Leith, Edinburgh, EH6 7NN

## The phytophagous early stages of *Loxocera sylvatica* Meigen (Diptera, Psilidae)

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### Summary

A male of the psilid, *Loxocera sylvatica* Meigen, was reared from a larva found mining the centre of a shoot of the Hairy Wood-Rush, *Luzula pilosa* (Juncaceae) in Scotland. The early stages are described from the puparium. They are readily identified on account of characters of the anal segment, anterior spiracles and head skeleton.

### Introduction

Most larval Psilidae are phytophagous, tunnelling in stems and roots of herbaceous plants and also feeding on cambial tissue under the bark of trees (Ferrar 1987). Phytophagy is best known in the pest species, the carrot root fly, *Chamaepsila rosae* (Fabricius), which has a large literature (Hardman *et al.* 1985). However, little data seems to be available on the early stages of the psilid genus *Loxocera* Meigen. De Meijere (1947) described the larva of *Loxocera albiseta* (Schrank) from a specimen found in the base of a stem of *Juncus* (Juncaceae). However Brindle (1965) considered that the species involved was probably *Loxocera aristata* (Panzer). Chandler (1975) refers to the probable foodplant of *Loxocera sylvatica* Meigen, 1826 as being *Luzula* (Juncaceae) based on finding adults regularly associating with these plants in the British Isles. In this paper we confirm the foodplant association of *L. sylvatica* with *Luzula*, consider larval biology and describe the puparium.

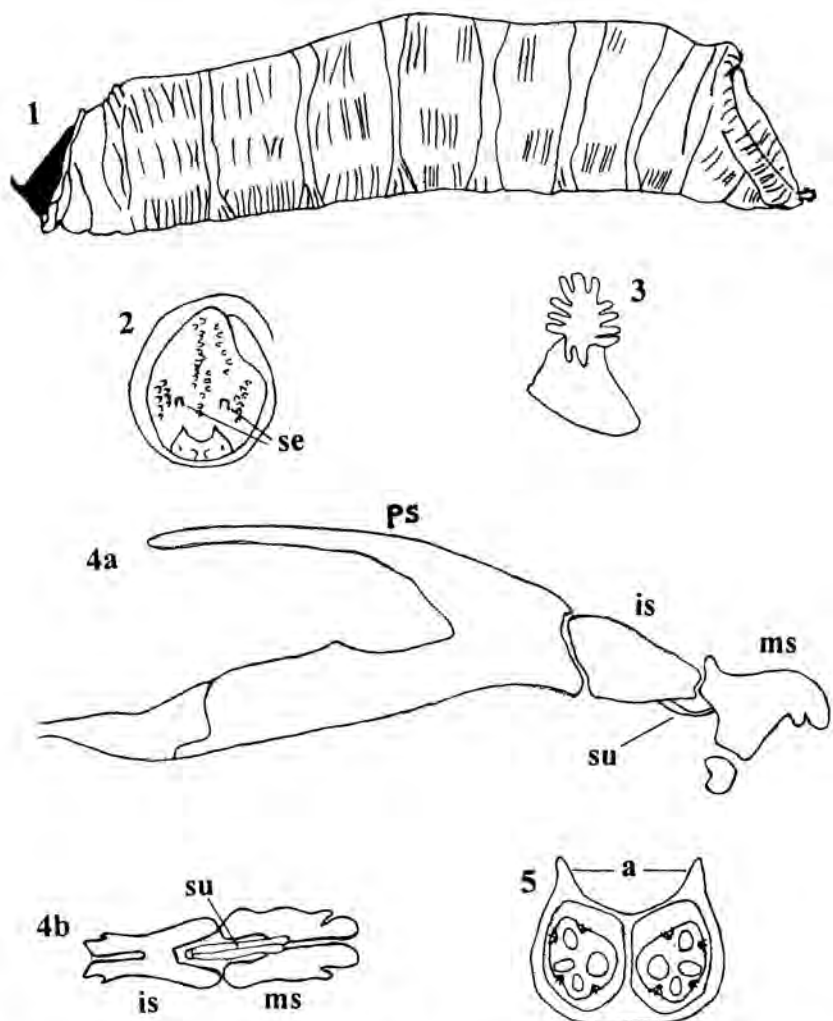
### Larval biology

On 9 March 2002 at Scrogbank Rig, near Elibank, Selkirkshire, Scotland (NT3837) one of us (KPB) found a single dipterous larva mining down the centre of a vegetative shoot of a plant of Hairy Wood-Rush, *Luzula pilosa* (Juncaceae). These plants, which also contained larval mines of *Elachista gleichenella* (Fabricius) and *Biselachista trapeziella* (Stainton) (Lepidoptera, Elachistidae), were growing at the top of the sloping bank alongside a track created to remove timber and partially shaded by a spruce tree, *Picea sitchensis*. The infested plant, consisting of several shoots and leaves, was potted into sphagnum and set aside for rearing.

Examination showed that only one shoot was infested. The larva was head down in the centre of the infested shoot, apparently feeding on the developing meristem. At first, no external signs of infestation were present. The larva was still in position on 24.iii.2002, but 4 days later the central leaves were beginning to wither and the larva appeared to be missing, thus the shoot was opened. This revealed a feeding chamber containing only a shrivelled integument. No exit hole was found on the infested shoot but the larva was re-discovered on 2.iv.2002 in another shoot. By mid-April 2002, the larva had turned round in the new chamber and pupated. An adult male emerged on 12.v.2002. The outline shape and coloration of the adult were visible through the puparium for at least two weeks before emergence.

**Description of the puparium:** one puparium examined.

**Overall appearance:** an elongate, subcylindrical puparium with an inclined thorax and posterior segment (Fig. 1); integument with numerous transverse wrinkles and broad bands separating the abdominal segments; red-brown except for black posterior breathing tubes with black apical hooks and dorsum of the posterior segment extensively black pigmented (Fig. 1).



Figs 1-5. Puparium of *Loxocera sylvatica* Meigen. 1, whole puparium, lateral view, head end to right, length 6mm; 2, anal segment, dorsal view, maximum width 0.72mm, se = sensilla; 3, anterior spiracle, dorsolateral view, length 0.13mm; 4a, head skeleton, lateral view, length 0.8mm, su = ligulate/subhypostomal sclerites; 4b, intermediate and mandibular sclerites, ventral view, is = intermediate sclerite, ms = mandibular sclerite, ps = pharyngeal sclerite; 5, posterior breathing process, apical view, maximum width 0.31mm, a = apical hook.

## Diagnosis

**Shape and dimensions:** length about 6mm and 1mm wide; subcylindrical in cross-section, tapering anteriorly and posteriorly; thorax and posterior (= anal) segment inclined dorsally with broad, rounded rims delimiting the inclinations; anal segment narrower and shorter than 7th abdominal segment with a pair of projecting sensilla anterior to the posterior breathing process and rows of pit-like indentations on the black marking (Fig. 2); **anterior spiracles** length 0.13mm with 12 spiracular openings of varying length arranged radially round the laterally-facing, inclined apex (Fig. 3); **integument** red-brown with numerous transverse wrinkles; segment boundaries indicated by broad bands, those on the thorax and first 4 abdominal segments matt in contrast to the shiny mid-segmental areas; however, segmental boundaries on abdominal segments 5-7 smooth and shiny; **locomotory welts** crescent-shaped bearing an irregular pattern of ridges with obscure spicules but these may have been lost on pupariation; **head skeleton** (Figs. 4a, b): length 0.8mm; heavily sclerotised; pharyngeal sclerite lacking pharyngeal ridges, windows or dorsal apodemes; dorsal cornu narrower than ventral cornu and dorsal bridge present; apex of pharyngeal sclerite same width as intermediate sclerite, with a narrow gap between them; parastomal bar absent; intermediate sclerite tapered anteriorly in lateral view, broad in dorsal view with weakly sclerotised posterior bridge; ventrally, strongly sclerotised bridge in the middle of the intermediate sclerite (Fig. 4b); ligulate/subhypostomal sclerites greatly produced and extending in a curve outside the intermediate sclerite and articulating with, but not fused with, the posterior margin of the mandibular sclerite; mandibular sclerite with accessory hooks; dental sclerite present; **posterior breathing process** (Fig. 5): black with a pair of apical hooks; mounted on short projection length 0.1mm; posterior margin of basal projection with a row of pit-like indentations; maximum width across spiracular plates 0.31mm; spiracular plates oval in shape bearing three openings and larger ecdysial scar or button; four groups of setae between spiracular openings.

## Discussion

The larva of *L. sylvatica* is similar to other psilid larvae. In particular, the posterior breathing process has oval-shaped spiracular openings and apical hooks and the head skeleton is similar in overall shape and in possessing well developed ligulate/subhypostomal sclerites which project below the intermediate sclerite (Fig. 4a). The larvae of several other acalypterate families, such as Lonchaeidae and Micropezidae, also possess posterior breathing processes bearing apical hooks. Larvae of Psilidae can be separated from such families by their apparently well developed ligulate/subhypostomal sclerites (Fig. 4a,b).

In comparison with other psilid larvae and puparia, those of *Loxocera* appear to be distinguished by the extensive black marking on the anal segment (Fig. 1). Characters separating the larva of *L. sylvatica* from that of *L. albiseta/aristata*, the only other *Loxocera* species known from the early stages (Ferrar 1987), have not been investigated.

An additional phytophagous acalypterate larva, that of *Suillia laevifrons* (Loew) (Diptera, Heleomyzidae), is known from *L. pilosa* (Bland and Rotheray 1996). The apical hooks of the posterior breathing process and the black marking on the anal segment also separate the larva/puparium of *L. sylvatica* from this species. These features are lacking in *S. laevifrons*. However, the feeding strategy of both larvae is similar. They mine down the central shoot of the food plant and apparently require more than one shoot to complete development. *Suillia laevifrons* makes an exit hole to leave the shoot (Bland and Rotheray 1996). This is not the case with *L. sylvatica*, which seems to exit backwards via the excavated feeding tunnel. Pupariation takes place within the shoot in *L. sylvatica*, but in the surrounding soil in *S. laevifrons*. The larvae share remarkably few characters. The main similarities are that both are elongate, have narrow anal segments and the head skeleton lacks ventral pharyngeal ridges, a feature associated with the development of phytophagy (Ferrar 1987). Otherwise they are very different.

morphologically (Table 1). In particular, the head skeleton of *L. sylvatica* appears to be much more derived. The pharyngeal sclerite narrows anteriorly and articulates precisely with the intermediate sclerite. In *S. laevisfrons* the pharyngeal sclerite is much broader than the intermediate sclerite at the anterior end and has a parastomal bar, which is the more frequent state among acalypterates (Bland and Rotheray 1996). Such differences suggest independent invasions of the same food plant and lack of close relationship between Heleomyzidae and Psilidae.

Precise articulation of the pharyngeal and intermediate sclerites is a feature of other psilids (see figures in Ferrar 1987). It also occurs in larvae of the genus *Stegana* Meigen (Drosophilidae) (Rotheray and Robertson 1998). The mandibular sclerite in *Stegana* larvae is large, heavily sclerotised and the two halves are fused medially (Rotheray and Robertson 1998). However these features are not all present in the mandibular sclerite of *L. sylvatica*. Although it is large and heavily sclerotised, the two halves are not fused and a pair of accessory hooks are additionally present. In ventral view the tip of the mandibular sclerite appears as a slightly curved four-toothed rake (Fig. 4a, b). Furthermore, in *L. sylvatica* and *Stegana* but unlike *S. laevisfrons*, the dorsal cornu of the pharyngeal sclerite is narrower than the ventral cornu. In *Stegana* larvae these features were interpreted as adaptations to scraping hard, particulate food and minimising wear and tear (Rotheray and Robertson 1998). The head skeleton of psilid larvae may be similarly adapted to rasping relatively hard food with minimal wear and tear. Accessory hooks may create a more efficient means of rasping particles of food and the distinctive and unusually well developed ligulate/subhypostomal sclerites may add strength to the head skeleton during rasping movements.

The morphological variation present in these larvae also demonstrates the value of including early stage data in taxonomic and biosystematic studies. Early stages are too often neglected because of an assumption that they are not as useful a source of character information as the adult stage. This assumption is made perhaps, because many previous studies of larvae appear to support it. However, all too often such studies tend to be superficial and generalised, and are a poor guide to larval morphology. Whenever detailed work is undertaken, a wealth of data is usually revealed, even at species level.

## References

- Bland, K. P. and Rotheray G. E. 1996. The phytophagous larva of *Saillia laevisfrons* (Diptera, Heleomyzidae). *Dipterists Digest (Second Series)* **3**, 1-4.
- Brindle, A. 1965. Taxonomic notes on the larvae of British Diptera. 22. Psilidae. *Entomologist* **98**, 169-173.
- Chandler, P. J. 1975. Observations on Plant Associations of the Psilidae. *Entomologist's Record and Journal of Variation* **87**, 13-17.
- De Meijere, J. C. H. 1947. Over eenige Dipterenlarven, waaronder een galmug, die mijngangen maakt, en twee Dipteren, die gallen op paddenstoelen Veroorzaken. *Tijdschrift voor Entomologie* **88**, 49-62.
- Ferrar, P. 1987. A Guide to the Breeding Habits and Immature Stages of Diptera Cyclorrhapha. *Entomonograph* **8**, 1-478.
- Hardman, J. A., Ellis, P. R. and Stanley, E. A. 1985. *Bibliography of the carrot fly*, *Psila rosae* (F.). Wellesbourne.
- Rotheray, G. E. and Robertson, D. 1998. Breeding habits and early stages of seven saproxylic acalypterates (Diptera). *Dipterists Digest (Second Series)* **5**, 96-107.

**Table 1. Comparison between the early stages of *Loxocera sylvatica* Meigen (Psilidae) and *Suillia laevifrons* (Loew) (Heleomyzidae) (Diptera), both mining the central shoot of *Luzula pilosa* (Juncaceae).**

| Character                                            | <i>Loxocera sylvatica</i>           | <i>Suillia laevifrons</i>           |
|------------------------------------------------------|-------------------------------------|-------------------------------------|
| 1. body shape                                        | elongate                            | elongate                            |
| 2. windows in pharyngeal sclerite                    | absent                              | present                             |
| 3. dorsal cornu v ventral cornu                      | narrower                            | about equal                         |
| 4. anterior margin of pharyngeal sclerite            | same width as intermediate sclerite | wider                               |
| 5. parastomal bar                                    | absent                              | present                             |
| 6. ventral pharyngeal ridges                         | absent                              | absent                              |
| 7. intermediate sclerite (lateral view)              | triangular                          | T-shaped                            |
| 8. ligulate/subhypostomal sclerites                  | well developed                      | not developed                       |
| 9. accessory hooks                                   | present                             | absent                              |
| 10. thorax shape                                     | probably not infolded               | infolded                            |
| 11. ventral margin of thorax                         | without coating of microsetae       | with coating of microsetae          |
| 12. anterior spiracles                               | rosette-shaped                      | fan-shaped                          |
| 13. margins of abdominal segments                    | marked by broad band                | without band                        |
| 14. shape of anal segment in relation to 7th segment | narrower                            | narrower                            |
| 15. sculpture of anal segment                        | black marked, not nodulate          | not black marked, coated in nodules |
| 16. sensilla on dorsal surface of anal segment       | one pair present                    | absent                              |
| 17. spiracular openings                              | oval-shaped                         | oval-shaped                         |
| 18. inter-spiracular setae                           | present                             | absent                              |
| 19. posterior breathing process                      | with apical hooks                   | without hooks                       |



## The first British record of *Spelobia* (*Spelobia*) *belanica* Roháček, 1983 (Diptera, Sphaeroceridae)

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### Summary

*Spelobia* (*Spelobia*) *belanica* Roháček, 1983 is recorded as new to the British fauna. The identity of *Minilimosina* (*M.*) *bicuspis* Roháček, 1993 as a British species is also confirmed.

In 1998, when the senior author visited The Natural History Museum (BMNH) in London, he had an opportunity to examine some material of Sphaeroceridae collected during wetland surveys carried out in the late 1980s by the Nature Conservancy Council and identified by the junior author. This study was concentrated on doubtfully identified or unidentified specimens. Among specimens examined were those published from Welsh peatlands by Holmes *et al.* (1991) under the name *Minilimosina trogeri* Roháček, 1983 and it was confirmed that they belong to the closely allied species *Minilimosina* (*M.*) *bicuspis* Roháček, 1993, which had been queried as probable in the British checklist (Roháček 1998). Similarly, also the records of *M. trogeri* from Spain (Carles-Tolrà 1990a, b) were based on misidentified specimens of *M. bicuspis* (recently re-examined by Dr. M. Carles-Tolrà *pers. comm.* 2002). While these misidentifications have been corrected as regards the British records in the World Catalog of Sphaeroceridae (Roháček *et al.* 2001), the Spanish record of *M. trogeri* was included there, although with a question mark and will only be definitely deleted in the CDEPA checklist (Carles-Tolrà in press).

*M. bicuspis* had previously been encountered in Britain by the junior author, when three males were collected at Cannock Chase, Staffordshire, by sweeping an area of open grassland being grazed by ponies on 10 April 1987. This species may be identified from Roháček (1993).

However, a more important result from study of the material from British wetlands is the following new record:

*Spelobia* (*Spelobia*) *belanica* Roháček, 1983. – ENGLAND, Norfolk: Hickling Broad, area E, TG424219, P (= pitfall trap) 2, 23.vi-7.vii.1988, 1♂ (BMNH); Sutton Broad, area D (TG367233), 23.vi.1988, 1♂ (BMNH); Catfield Fen, area D (TG365210), 17-31.viii.1990, 3♂ (2 in J. Valentine collection, 1 in Silesian Museum collection): all specimens collected by A. Foster and D. Procter.

This rare species is preferentially associated with lagg meadows of mires and various marshy meadows: it was found on detritus in burrows of *Microtus* species, sifted from grass and moss, collected by pan traps or swept from marshland vegetation (see Roháček 1983, 1996; Florén 1989; Roháček and Barták 1999). A very limited number of specimens are known from the Czech Republic (Roháček 1996; Roháček and Barták 1999), Denmark (Roháček 1983), Hungary (Papp 1990), Slovakia (Roháček 1983) and Sweden (Florén 1989). The British record is very important from the biogeographical point of view because it represents a new westernmost distributional limit of the species. The species may be determined from the monograph of the genus by Roháček (1983).

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### References

- Carles-Tolrà, M. 1990a. New species and records of Sphaeroceridae (Diptera) from Spain. *Entomologist's monthly Magazine* **126**, 33-46.
- Carles-Tolrà, M. 1990b. Catálogo de los Sphaeroceridae de España peninsular e Islas Baleares (Diptera: Acalyptratae). *Sessió Conjunta d'Entomologia (Institut Catalana d'Historia Natural - Societat Catalana de Lepidopterologia)* **6**(1989), 213-220.
- Florén, F. 1989. Distribution, phenology and habitats of the lesser dung fly species (Diptera, Sphaeroceridae) of Sweden and Norway, with notes from adjacent countries. *Entomologisk Tidskrift* **110**, 1-29.
- Holmes, P. R., Valentine, J., Boyce, D. C. and Reed, D. K. 1991. Lesser dung flies (Diptera: Sphaeroceridae) in Welsh peatlands. *Dipterists Digest (First Series)* **8**, 6-13.
- Papp, L. 1990. Sphaeroceridae (Diptera) of Hungary. *Folia Entomologica Hungarica* **51**, 107-112.
- Roháček, J. 1983. A monograph and re-classification of the previous genus *Limosina* Macquart (Diptera, Sphaeroceridae) of Europe. Part II. *Beiträge zur Entomologie, Berlin* **33**, 3-195.
- Roháček, J. 1993. *Herniosina* Roháček and *Minilimosina* Roháček of Europe: two new species, new records and taxonomic notes (Insecta, Diptera: Sphaeroceridae). *Entomologische Abhandlungen, Staatliches Museum für Tierkunde in Dresden* **55**, 185-203.
- Roháček, J. 1996. Sphaeroceridae (Diptera) of the Czech Republic: corrections and additions to the faunal list, with taxonomical notes. *Časopis Slezského zemského Muzea, Opava (A)* **44**(1995), 219-240.
- Roháček, J. 1998. Sphaeroceridae, pp. 151-155. In Chandler, P.J. (Ed.) Checklists of Insects of the British Isles (New Series). Part 1: Diptera (Incorporating a List of Irish Diptera). *Handbooks for the Identification of British Insects* **12**(1), i-xix, 1-234. Royal Entomological Society, London.
- Roháček, J. and Barták, M. 1999. Sphaeroceridae (Diptera) of peat-bogs in the Šumava Mts. (SW Bohemia, Czech Republic). *Časopis Slezského zemského muzea Opava (A)* **48**, 9-32.
- Roháček J., Marshall S. A., Norrbom A.L., Buck M., Quiros D. I. and Smith I., 2001. *World catalog of Sphaeroceridae (Diptera)*, 414 pp., Slezské zemské muzeum, Opava.

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