Dipterists Digest

2010 Vol. 17 No. 1

Cover illustration: ***Thyridanthrax fenestratus*** **(Fallén, 1814) (Diptera, Bombyliidae) (right) and its host** ***Ammophila pubescens*** **(Curtis, 1836) (Hymenoptera, Sphecidae), photograph by Steven Falk. See note by Stephen Miles and John Muggleton.**

Dipterists Digest

Vol. 17 No. 1

Second Series

2010 Published 30th July 2010

Published by

Dipterists Forum

ISSN 0953-7260

Dipterists Digest

Dipterists Digest is the journal of the **Dipterists Forum**. It is intended for amateur, semi-professional and professional field dipterists with interests in British and European flies. All notes and papers submitted to **Dipterists Digest** are refereed.

The scope of **Dipterists Digest** is:

- the behaviour, ecology and natural history of flies;
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- the conservation of flies;
- provisional and interim reports from the Diptera Recording Schemes, including maps;
- records and assessments of rare or scarce species and those new to regions, countries etc.;
- local faunal accounts and field meeting results, especially if accompanied by good ecological or natural history interpretation;
- descriptions of species new to science;
- notes on identification and deletions or amendments to standard key works and checklists.

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Style and format should follow articles published in the most recent issue. A short Summary (in the form of an Abstract) should be included at the beginning of each article. References to journals should give the title of the journal in full. Scientific names should be italicised. Authors of scientific names should be given in full and nomenclature should follow the most recent checklist, unless reflecting subsequent changes. Figures should be drawn in clear black ink, about 1.5 times their printed size and lettered clearly. **Colour photographs will also be considered.** Descriptions of new species should include a statement of the museum or institution in which type material is being deposited.

Authors will be provided with twenty separates of papers of two or more pages in length.

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Dipterists Digest 2010 **17**, 1-6

Morphological separation of the European members of the genus *Culiseta* (Diptera, Culicidae)

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Summary
To facilitate increased recording of native and non-native British mosquito species, identification keys to the European members of the genus *Culiseta* are presented.

Introduction

Following a recent article on the discovery of *Aedes* (*Aedes*) *geminus*, a species of mosquito new to Britain (Medlock and Vaux 2009), the coordinators of the Culicidae recording scheme have focussed attention to the possible existence of other previously unrecorded species. This article focuses on the European members of the genus *Culiseta*, specifically the six species within the subgenera *Culiseta* and *Culicella* that in the adult stage lack the clumps of dark scales on the wings (i.e. those species morphologically similar to the common mosquito *Culiseta morsitans*). This paper aims to build on the existing keys for British mosquitoes by Cranston *et al.* (1987) and Snow (1990) by providing identification notes (for adult females and males, and fourth-instar larvae) for currently non-native European species within this genus. Reference should also be made to an earlier key by Ramsdale & Snow (1994) on differentiating European *Culiseta*.

In Europe there are 10 species in the genus *Culiseta*: 5 in the subgenus *Culiseta* (*C. annulata*, *C. subochrea*, *C. alaskaensis*, *C. glaphyroptera*, *C. bergrothi*), 1 in the sub-genus *Allotheobaldia* (*C. longiareolata*) and 4 in the sub-genus *Culicella* (*C. morsitans*, *C. litorea*, *C. fumipennis*, *C. ochroptera*). Those underlined have been recorded in the British Isles.

Identification notes for the separation of adult females of the genus *Culiseta*

Culiseta annulata, C. subochrea and *C. alaskaensis* all have wings with dark scales aggregated to form dark spots, especially prominent close to the crossveins and at the base of cells R_2 and M_1 (Cranston *et al.* 1987). Although this feature is common to all British members of the subgenus *Culiseta*, this is not the case for the other two non-native European species, *C. glaphyroptera* and *C. bergrothi*.

Culiseta longiareolata also has wings with dark scales aggregated to form dark spots; however, it can be separated from all other members of this genus by the pattern of scales on the scutum, femora and tibiae. According to Cranston *et al.* (1987), the scutum of this species has 'three distinct longitudinal stripes of white scales, resembling a lyre in shape' and 'femora and tibiae with white scales aggregated into conspicuous spots or stripes.'

Keys 1 and 2 should be used to separate adult females of all 10 European species of *Culiseta*:

Key 1:

1. Wings with dark scales aggregated to form dark spots.....2
- No dark spots on wings.....Key 2

2. Scutum with distinct longitudinal white stripes resembling a lyre; femora and tibiae with white scales aggregated into conspicuous spots or stripes ..... *C. longiareolata*
- Scutum otherwise (no pattern, or with 2 white spots), and femora and tibiae without spots and stripes 3
3. Tarsomere I of all legs entirely dark; femora with scattered pale scales ..... *C. alaskaensis*
- Tarsomere I of all legs with median pale ring; femora with subapical pale ring 4
4. Terga III-V with only one basal pale band ..... *C. annulata*
- Terga III-V almost completely covered with pale scales ..... *C. subochrea*

The remaining six species (including the three British species in subgenus *Culicella*) are not easily separated. According to Cranston *et al.* (1987), the three British species can be separated by the presence/absence and strength of colour of the pale scales on tarsomeres IV and V. A key for the European species (Schaffner *et al.* 2001) provides some additional features to separate these six species and these are summarised in Table 1.

Table 1

Adult female	***morsitans***	***bergrothi***	***fumipennis***	***litorea***	***glaphyroptera***	***ochroptera***
Hind tarsomere IV	dark	dark	basal pale ring	basal pale ring	dark	dark
Maxillary palpus (scales)	pale apex	scattered pale scales	scattered pale scales	pale apex	dark scales	scattered pale scales
Scutum	no pattern	2 lateral pale spots	no pattern	no pattern	2 lateral pale spots	no pattern
Femora (scales) #	dark	dark	dark	dark	dark	scattered pale scales
Wing venation	mcu* shifted to the left of rm+	rm and mcu in a line	mcu shifted to the left of rm	mcu shifted to the left of rm	rm and mcu in a line	mcu shifted to the left of rm
Tarsomere I of all legs	dark, 2 pale rings (apical & basal)	dark, 2 pale rings (apical & basal)	dark, 2 pale rings (apical & basal) OR scattered pale scales	dark, 2 pale rings (apical & basal)	dark, 2 pale rings (apical & basal)	scattered pale scales

Note: femora described as dark may sometimes have an apical pale ring.
* Mediocubital crossvein, + radiomedial crossvein.

Key 2:

1. Hind tarsomere IV dark 2
- Hind tarsomere IV with basal pale ring 5
2. Femora and tarsomere I of all legs with scattered pale scales ..... *C. ochroptera*
- Femora dark-scaled; tarsomere I dark with 2 pale rings (basal & apical) 3

3. Scutum with no pattern; maxillary palpus with pale apex; mcu shifted to left of rm ..... *C. morsitans*
- Scutum with 2 lateral pale spots; maxillary palpus dark or with scattered pale scales; rm and mcu in a line 4
4. Maxillary palpus entirely dark-scaled ..... *C. glaphyroptera*
- Maxillary palpus with scattered pale scales ..... *C. bergrothi*
5. Maxillary palpus with apical pale band ..... *C. litorea*
- Maxillary palpus with scattered pale scales ..... *C. fumipennis*

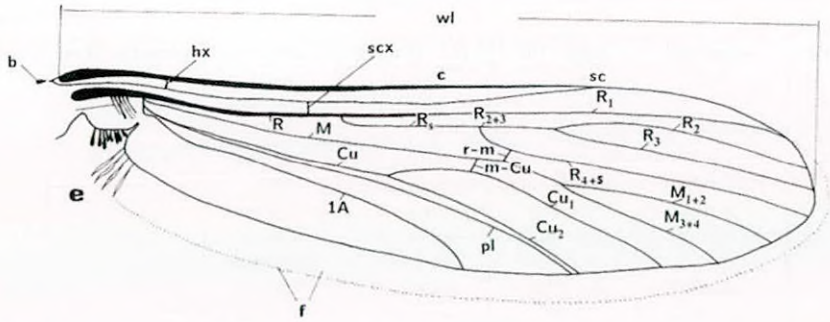

Fig. 1. Generalised mosquito wing venation, showing the mediocubital crossvein (mcu) and the radio medial crossvein (rm). Adapted from Cranston *et al.* (1987).

Identification notes for separation of adult males within the genus *Culiseta*

Many of the features used to distinguish the adult females also apply to the males. Key 3 indicates the key features used to separate the four species with spotted wings (adapted from Cranston *et al.* 1987 and Schaffner *et al.* 2001).

Key 3:

1. Wings with dark scales aggregated to form dark spots 2
- No dark spots on wings ..... Key 4
2. Scutum with three distinct longitudinal white stripes resembling a lyre; femora and tibiae with white scales aggregated into conspicuous spots or stripes ..... *C. longiareolata*
- Scutum otherwise (no pattern, or with 2 white spots); femora and tibiae without spots and stripes 3
3. Tarsomere I of all legs entirely dark; femora with scattered pale scales ..... *C. alaskaensis*
- Tarsomere I of all legs with median pale ring; femora with a subapical ring 4
4. Terga III-V with one basal pale band; basal lobe of gonocoxite with 2 or 3 strong setae ..... *C. annulata*
- Terga III-V almost completely covered in scales; basal lobe of gonocoxite with 4 or 5 strong setae ..... *C. subochrea*

Additional features to aid differentiation of some of these species are shown in Table 2.

Table 2:

Adult male	*annulata*	*subochrea*	*alaskaensis*
Terga III-V	basal pale band	almost completely covered in scales	basal pale band
Basal lobe of gonocoxite	2 or 3 strong setae	4 or 5 strong setae	2 or 3 strong setae
Tarsomere I of all legs	one median pale ring	one median pale ring	no more than 2 pale rings (basal and apical)

Table 3:

Adult male	*morsitans*	*bergrothi*	*fumipennis*	*litorea*	*glaphyroptera*	*ochroptera*
Mid tarsomere IV	dark	dark	basal pale ring	basal pale ring	dark	dark
Subapical lobe of gonocoxite	tapering, not protuberant with no/simple (i.e. not lanceolate) setae	tapering, not protuberant with no/simple (i.e. not lanceolate) setae	tapering, not protuberant, with no/simple (i.e. not lanceolate) setae	tapering, not protuberant with no/simple (i.e. not lanceolate) setae	Protuberant, with lanceolate setae	tapering, not protuberant, with no/simple (i.e. not lanceolate) setae
Basal lobe of gonocoxite	2-5 strong setae, none reaching apex of gonocoxite	2 or 3 strong setae, none reaching apex of gonocoxite	4 or 5 strong setae, none reaching apex of gonocoxite	2 strong setae, one reaching apex of gonocoxite	2 or 3 strong setae, none reaching apex of gonocoxite	> 5 strong setae, none reaching apex of gonocoxite
Scutum	no pattern	2 lateral pale spots	no pattern	no pattern	2 lateral pale spots	no pattern
Femora (scales) #	dark	dark	dark	dark	dark	scattered pale scales
Wing venation	mcu* shifted to the left of rm+	rm and mcu in a line	mcu shifted to the left of rm	mcu shifted to the left of rm	rm and mcu in a line	mcu shifted to the left of rm
Tarsomere I of all legs	2 pale rings (apical & basal)	2 pale rings (apical & basal)	2 pale rings (apical & basal) OR with scattered pale scales	2 pale rings (apical & basal)	2 pale rings (apical & basal)	scattered pale scales

Note: femora described as dark may sometimes have an apical pale ring.
* Mediocubital crossvein, + radiomedial crossvein.

Adult males of the remaining six members of the genus can be separated by having features similar to those discussed for adult females; however, two additional features concerning the gonocoxite can be used as diagnostic features. These are summarised in Table 3 and Key 4.

Key 4:

1. Hind tarsomere IV dark 2
- Hind tarsomere IV with basal pale ring 5
2. Subapical lobe of gonocoxite protuberant, with lanceolate setae ..... *C. glaphyroptera*
- Subapical lobe of gonocoxite without protuberance or lanceolate setae 3
3. Basal lobe of gonocoxite with more than 5 strong setae; tarsomere I of all legs with scattered pale scales ..... *C. ochroptera*
- Basal lobe of gonoxite with up to 5 strong setae; tarsomere I of all legs with 2 pale rings (apically and basally) 4
4. Crossvein mcu shifted to left of rm; scutum without pattern; 2-5 strong setae on basal lobe of gonocoxite; apical lobe of gonocoxite slightly differentiated, without setae ..... *C. morsitans*
- Crossveins rm and mcu in a line; scutum with 2 lateral pale spots; 2 or 3 strong setae on basal lobe of gonocoxite; apical lobe of gonocoxite slightly differentiated, with setae ..... *C. bergrothi*
5. Basal lobe of gonocoxite with 2 strong setae, one reaching apex of gonocoxite ..... *C. litorea*
- Basal lobe of gonocoxite with 4 or 5 strong setae, none reaching apex of gonocoxite ..... *C. fumipennis*

Identification notes for separation of fourth-instar larvae of *Culiseta*

The fourth-instar larvae of most of the *Culiseta* species can be separated except *C. morsitans* from *C. litorea* and *C. annulata* from *C. subochrea*. A key for separation of all species (adapted from Schaffner *et al.* 2001) is given in Key 5.

Key 5:

1. Siphon short, stout (length/width ratio <2:1), with spines and no setae ..... *C. longiareolata*
- Siphon medium (ratio 2-4:1), with both spines and setae ..... 2 (subgenus *Culiseta*)
- Siphon long (ratio >4:1), with only spines ..... 5 (subgenus *Culicella*)
2. Seta 6-C with > 5 branches 3
- Seta 6-C with 2 or 3 branches 4
3. Spines outnumber setae; pecten nearly 0.67 siphon length ..... *C. bergrothi*
- Setae outnumber spines; pecten nearly 0.75 siphon length ..... *C. glaphyoptera*
4. Pecten nearly 0.75 siphon length ..... *C. alaskaensis*
- Pecten nearly 0.67 siphon length ..... *C. annulata / C. subochrea*
5. Seta 5-C with > 5 branches ..... *C. ochroptera*
- Seta 5-C with 2 or 3 branches 6
6. Pecten nearly 0.67 siphon length ..... *C. fumipennis*
- Pecten < 0.33 siphon length ..... *C. morsitans / C. litorea*

For further information on the morphological separation of the species and details of their ecology and distribution in Europe, reference should be made to Shute (1933), Service (1969), Ramsdale and Wilkes (1985), Snow (1990), Ramsdale and Snow (1994), Service (1994) Schaffner *et al.* (2001) and Becker *et al.* (2003). The Culicidae recording scheme welcomes all samples or records of *Culiseta* mosquitoes, particularly if they appear to be non-native species.

Acknowledgements
We are grateful to Keith Snow and Ralph Harbach for comments on the manuscript.

References

Becker, N., Petrić, D., Zgomba, M., Boase, C., Dahl, C., Lane, J. and Kaiser, A. 2003. *Mosquitoes and Their Control*. xxi + 498 pp. Kluwer Academic / Plenum Publishers, New York.

Cranston, P.S., Ramsdale, C.D., Snow, K.R. and White, G.B. 1987. Adults, larvae and pupae of British mosquitoes (Culicidae). *Scientific Publication*, no **48,** pp 1-152. Freshwater Biological Association, Ambleside, Cumbria.

Medlock, J.M. and Vaux, A.G.C. 2009. *Aedes (Aedes) geminus* Peus (Diptera, Culicidae) – an addition to the British mosquito fauna. *Dipterists Digest* (*Second Series*) **16**, 147-150.

Ramsdale, C.D. and Snow, K.R. 1994. Mosquitoes from north-western Europe not recorded in Britain: II. Genera *Anopheles, Culex* and *Culiseta. The Entomologist* **113** (2) 112-119.

Ramsdale, C.D. and Wilkes, T.J. 1985. Some aspects of over wintering in southern England of the mosquitoes *Anopheles atroparvus* and *Culiseta annulata*. *Ecological Entomology* **10**, 449-454.

Schaffner, F., Angel, G., Geoffroy, B., Rhaiem, A., Hervy, J.-P and Brunhes, J. 2001. The Mosquitoes of Europe / Les moustiques d'Europe. Programme d'identification et d'enseignment, Montpellier, IRD Ed. & EID Mediterranée (CD-ROM).

Service, M.W. 1969. Observations on feeding and oviposition in some British mosquitoes. *Entomologia Experimentalis et Applicata* **11**, 286-290.

Service, M.W. 1994. The biology of *Culiseta morsitans* and *Culiseta litorea* in England. *Bulletin of Entomological Research* **84**, 97-104.

Shute, P.G. 1933. The life history and habits of British mosquitoes in relation to their control by anti-larval operations. *Journal of Tropical Medicine and Hygiene* **36**, 83-88.

Snow, K.R. 1990. *Mosquitoes. Naturalists' Handbooks Series.* Richmond Publishers, London.

Cerodontha affinis (Fallén, 1823) (Diptera, Agromyzidae) in East Kent

- *Cerodontha affinis* was added to the British list by David Gibbs from two females collected at Woo Dale, Derbyshire by Andy Godfrey and Derek Whiteley on 6 July 2004 and 12 July 2005 respectively (Gibbs, D. 2006. The British species of *Cerodontha* Rondani, 1861 subgenus *Cerodontha* (Diptera, Agromyzidae), including two species new to the British list. *Dipterists Digest* **13,** 59-64).

While examining my backlog of unidentified Agromyzidae shortly after, I discovered a single female taken at Lydden LNR, near Dover (TR2745) on 29 May 1989. On 6 June 2010 I swept a male at Postling Downs Coombe (TR1439). Both sites are dry chalk downland and thus similar to Woo Dale, stated to be a dry valley on Carboniferous limestone. The earlier dates of the Kent specimens may relate to the warmer climate in the south-east of England - **LAURENCE CLEMONS,** 14 St. John's Avenue, Sittingbourne, Kent ME10 4NE

Dipterists Digest 2010 **17**, 7-12

Chyromya miladae Andersson, a new record, and *Aphaniosoma germanicum* a new species (Diptera, Chyromyidae) from Germany

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Summary
A new species, *Aphaniosoma germanicum* is described from Germany. *Chyromya miladae* Andersson, 1976 is a new record for the country. The German list of species of the family Chyromyidae is updated.

Introduction

Although the Palaearctic species of *Aphaniosoma* Becker, 1903 were reviewed only twelve years ago (Ebejer 1998a), that work is now outdated. Since then, many species have been described from the Mediterranean and the Canary Islands (Carles-Tolrá 2001, Ebejer 2005, Ebejer and Báez 2001) and the Eastern Palaearctic (Ebejer 2006). There are still more species from the Mediterranean awaiting description. Nevertheless, it is of considerable interest that a new species has been found in Central Europe. The nomenclature and the identification of the various postabdominal structures have also advanced (Ebejer 2009). This needs to be taken into account when comparing structures with illustrations in the older literature.

Dr Jens-Hermann Stuke (Leer, Germany) kindly sent me a sample of Chyromyidae for identification. This material included an undescribed species of *Aphaniosoma*. It belongs to the group of species characterised by a darker coloration than is typical of the family, namely dark grey instead of yellow, by a pair of long setae in front of the ocellar triangle and by having long, narrow, black surstylus and postgonite, these being frequently visible without dissection. The shape of these structures, in combination with some subtle somatic and chromatic characters, separated this series of specimens from the rest and suggested that it may belong to an undescribed species. Upon dissection of a male, this was confirmed.

After the publication of the German checklist of Diptera (Martinek 1999), there were further additions to the Chyromyidae of Germany (Drees 2004, Bährmann 2006, Tschirnhaus 2007 and 2008), and Stuke (2008) added more data, but not more species. The new taxon described here and the record of *Chyromya miladae* Andersson, bring to 13 species the total known from Germany (Table 1). However, *Chyromya britannica* Gibbs, 2007 and *Gymnochiromyia mihalyii* Soós, 1979, two species found in neighbouring countries are also very likely to occur in Germany. The first is known from Britain (Gibbs 2007) and France (Withers 2008), and I have seen a specimen from Slovenia in the Natural History Museum London. The second is known from Britain (Ebejer 1998b), Italy (Ebejer 2005) and Switzerland (Merz 1997). I suspect that they are overlooked because they were described relatively recently and because they present some difficulty in their identification.

Two specific names in the genus *Aphaniosoma* need amendment. These are *melitensis* Ebejer 1993, which should read *melitense* and *scutellaris* Ebejer, 1998, which should read *scutellare*. This is because both words are adjectives and must therefore agree in gender with the neuter generic name *Aphaniosoma* (Peter Chandler *pers. comm.*).

Aphaniosoma semiconsors Czerny, 1927 and *A. latifrons* (Loew, 1873) were described from the female sex with no accompanying males. These two species are very similar to *A. melitense* Ebejer, 1993 and *A. micromacro* Carles-Tolra, 2001. It is not possible to separate females of these four species on external characters. Studies of the female terminalia of Palaearctic species are ongoing in an attempt to resolve the taxonomic uncertainties. Until then *A. semiconsors* should remain on the German list as provisional.

Table 1. A list of the Chyromyidae of Germany.

1. *Aphaniosoma bifalcatum* Ebejer, 2005
2. *Aphaniosoma germanicum* sp. n.
3. *Aphanisosoma melitense* Ebejer, 1993
4. *Aphaniosoma propinquans* Collin, 1949
5. *Aphaniosoma scutellare* Ebejer, 1998
6. *Aphaniosoma semiconsors* Czerny, 1927
7. *Aphaniosoma socium* Collin 1949
8. *Chyromya femorellum* (Fallén, 1820)
9. *Chyromya flava* (Linnaeus, 1758)
10. *Chyromya miladae* Andersson, 1976
11. *Chyromya oppidana* (Scopoli, 1763)
12. *Gymnochiromyia flavella* (Zetterstedt, 1848)
13. *Gymnochiromyia inermis* (Collin, 1933)

***Chyromya miladae* Andersson, 1976**
Material examined: Germany, Oberpfalz, NM Main-Donau-Kanal: 1♂, 2♀♀, Rappersdorf 1 SF, 9-20.vi.1988; 1♀, Rappersdorf 1 SF, 21-29.vi.1988; 1♀, Rappersdorf 1 MF, 18-24.vii.1988; 1♀, Berching 8b SF, 18-24.vii.1988; 3♂♂, 3♀♀, Ottmaring 14 MF, 21-29.vi.1988 (2♂♂, 2♀♀, same data, but Ebejer collection); 1♂, 4♀♀, Ottmaring 14 MF, 11-17.vii.1988, (all Proj. Warncke).

This is a new record for Germany. It is not uncommon in Central Europe. It can be difficult to separate it from *Chyromya britannica* Gibbs, 2007. However, the description of the latter includes an account and figures of the characters separating the two species.

***Aphaniosoma germanicum* sp. n.**
Diagnosis: a species with occiput, entire thorax, scutellum and abdominal tergites dark grey, only pleural sutures yellow; frons with long, strong pair of setae in front of ocellar triangle; male postabdomen with long, dark surstylus and exceptionally long, narrow postgonite.

Description
Male. Head: frons, face and gena yellow; ocellar triangle and occiput black with uniform dark grey pollinosity, only postocular margin very narrowly yellow; margins of frons converging such that at level of antenna width about 0.7 that at level of anterior ocellus; eye oval, lying obliquely and almost horizontal with longitudinal diameter about 1.8 x vertical diameter; gena about 0.8 x height of eye at middle; antenna all yellow, but 3rd segment (first flagellomere) dusky especially around base of arista; arista with dusky 1st segment and dark brown second segment; mouthparts yellow, palp small and narrow. Chaetotaxy: 2 long orbitals with 2 short setulae in front of these, hind orbital as long as about half width of frons

at vertex; ocellars as long as anterior orbital, proclinate and diverging; internal and external verticals as long as hind orbital, postverticals are short setulae that are crossed; a pair of long strong setae in middle of frons in front of ocellar triangle, parallel, set as wide as or wider than ocellar triangle and reaching forward as far as anterior margin of frons; 2 setulae longer than others at vibrissal corner of mouth margin.

Thorax. Scutum and scutellum black with uniform dark grey pollinosity, only extreme apical margin of scutellum faintly yellowish; postpronotal lobe and area of notopleuron around hind notopleural seta yellow; pleurotergites (laterotergite) as dark as scutum, leaving only a narrow yellow margin along the suture lines; subscutellum (metanotum) black, but membrane joining this to undersurface of scutellum yellow. Chaetotaxy: 2+4 dorsocentrals, the anterior very short but gradually lengthening such that hindmost dorsocentral long and strong, 2+3 acrostichals in 2 rows separated by a distance a little less than that separating them from dorsocentral lines; 1 postpronotal, 2 notopleural, 1 posthumeral, 0+3 intra-alar, 1 postalar; 1 anepisternal at upper third of posterior margin, 1 katepisternal at upper posterior corner of sclerite, each with a few pale setulae in front; scutellum with 1 lateral and 1 subapical seta, all longer than length of scutellum.

Wing: hyaline with brown veins, darker towards apex, but vein between anterior basal and discal cells pale; crossveins close together, separated by distance about same length as posterior crossvein, itself only about 0.3 length of distal section of Cu; distance on costal margin between R2+3 and R3+4 about 0.4 that between R3+4 and M1+2. Haltere bright yellow.

Legs: yellow except extreme base of coxae, dark grey and 5th tarsomere of all legs, dark brown. Setae and setulae yellow, becoming darker apically on tibiae and tarsi; claws black.

Abdomen. Tergites dark brownish black, leaving only extreme hind margin and membrane yellow, numerous fine pale brown setulae scattered on tergites, length about 0.2 to 0.3 that of tergite.

Postabdomen (Fig. 1). Tergite 6 narrow, especially dorsally, where it is about 0.25 length of tergite 5. Cercus pale yellow and with very long fine setae at apex; epandrium dark except for small dull yellowish patch at middle, with a fringe of fine setulae along upper medial border; surstylus long, narrow and curved upwards at apex; pregonite translucent, only slightly curved downwards and inwards and with very minute setulae; postgonite very long and narrow, almost straight; distiphallus mostly membranous (detail not visible because it is folded internally and anterior to basiphallus).

Female. Similar to male, but pair of long frontal setae not reaching anterior margin of frons; 3rd antennal segment tending to be a little duskier. Postabdomen: cerci bare and small; sternite 8 divided into two small sclerites; sternite 7 large, with a shallow median carina in apical half, well sclerotised and with long setae (Fig. 2).

Length. Male 1.3 mm, wing 1.4 mm; female 1.4 mm, wing 1.5 mm.

Variation. Base of orbital setae and long frontal setae sometimes inserted in small dark spots; width of pale marginal bands at apex of tergites a little variable, especially on sides towards apex of abdomen; 4th tarsomere also a little brownish in some specimens; apex of scutellum can be as black as rest of scutellum.

Etymology. The species is named after the country where it was discovered.

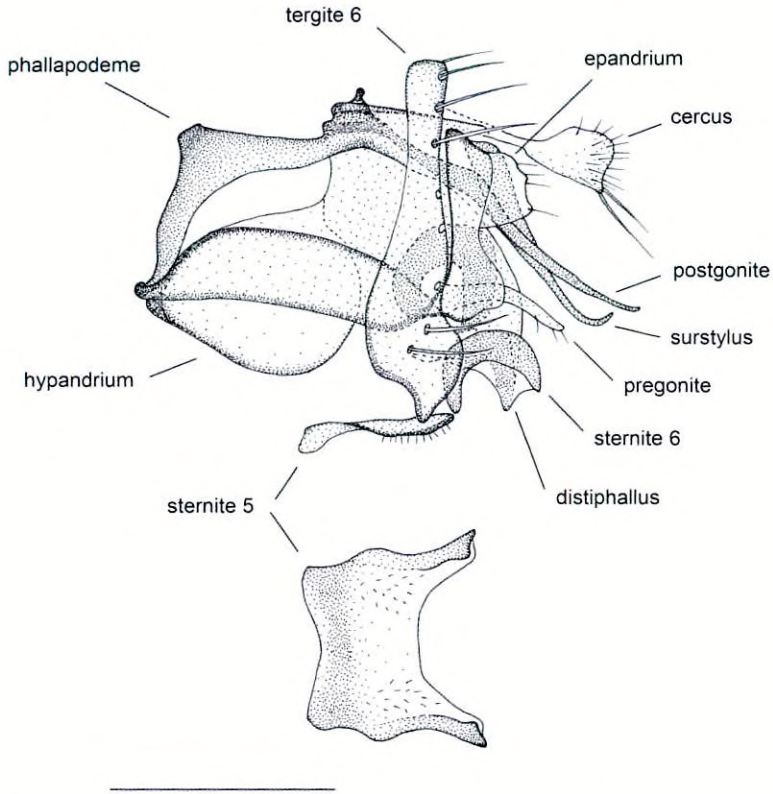

Fig. 1. ***Aphaniosoma germanicum*** **sp. n., male postabdomen, lateral view; sternite 6 also shown from ventral aspect. Scale bar = 0.15 mm.**

Holotype ♂, **Germany, Niedersachsen**, LDK Helmstedt, Kalihalde Beienrode, 21.v.2009, J-H. Stuke, deposited in the National Museum of Wales, Cardiff, UK. Paratypes: 1♀, same data and depository; 1♂, 1♀, same data, but Zoologische Staatsammlung Munich, Germany; 1♂, 2♀♀, same data, but Stuke collection; 1♂, 1♀, Niedersachsen, LDK Celle, Kalihalde SW Wathlingen, 22.v.2009, J-H. Stuke, National Museum of Wales, Cardiff, UK; 1♂, Niedersachsen, Hildesheim, Kaliwerk Siegfried N Giesen, 26.vi.2009, J-H. Stuke, Stuke collection, Germany.

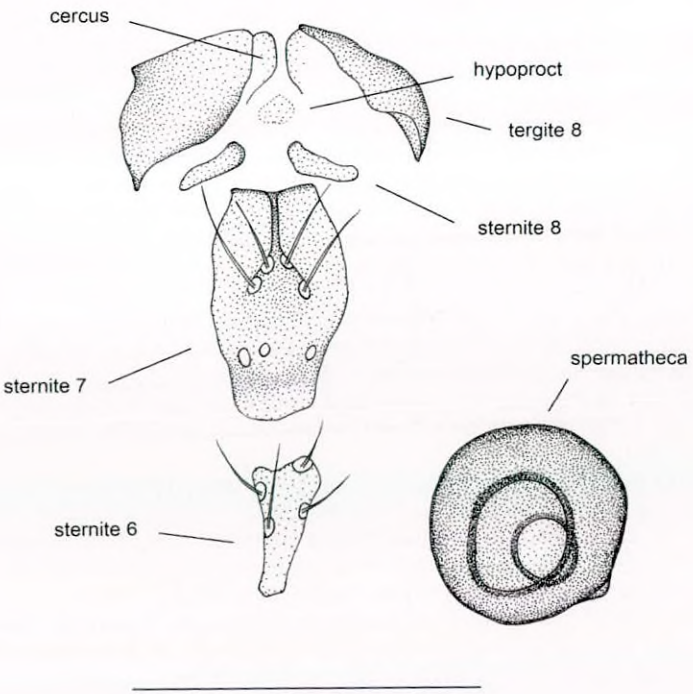

Fig. 2. ***Aphaniosoma germanicum*** **sp. n., female postabdomen, ventral. Scale bar = 0.15 mm.**

Discussion

The new species of *Aphaniosoma* is most similar to *A. bifalcatum* Ebejer, 2005 and *A. scutellare* Ebejer, 1998, both species only recently recorded from Germany; *A. scutellare* has a yellow scutellum with the lateral borders black, the acrostichals more numerous and reaching the level of the posterior dorsocentral seta as they do in *A. bifalcatum*, but only *A. bifalcatum* has the anterior dorsocentral and acrostichal setae, at the level of the transverse suture, as long as or a little longer than the intervening distance between the rows. Only in *A. bifalcatum*, the internal and external vertical setae are on a dark ground and only *A. scutellare* has the third antennal segment dark brown. Apart from the long pair of setae in the middle of the frons, *A. bifalcatum* and *A. scutellare* have several fine setulae scattered in this area, but *A. germanicum* lacks these.

Acknowledgements

I thank Jens-Hermann Stuke for sending his Chyromyidae for identification and for allowing me to describe the new species. I am also grateful to Marion Kotrba and Wolfgang Schacht (Zoological Museum, Munich) for permission to publish their records of *C. miladae*.

References

Bährmann, R. 2006. Zur kenntnis der Chyromyidae (Diptera) Mitteldeutschlands. *Studia dipterologica* **10**(1), 391-395.

Carles-Tolrá, M. 2001. Eight new chyromyid species from Spain (Diptera, Chyromyidae). *Boletín de la Asociación española de Entomología* **25**(3-4), 45-62.

Drees, M. 2004. Nachweis von *Phyllomyza longipalpis* und *Gymnochiromyia inermis* (Diptera: Milichiidae et Chyromyidae) in Westfalen. *Decheniana* **157**, 129-130.

Ebejer, M.J. 1998a. A Review of the Palaearctic Species of *Aphaniosoma* Becker (Diptera, Chyromyidae), with Descriptions of New Species and a Key for the Identification of Adults. *Mitteilungen Museum für Naturkunde Berliner Deutsche Entomologische Zeitschrift* **45**(2), 191-230.

Ebejer, M.J. 1998b. A new species of *Gymnochiromyia* Hendel (Diptera: Chyromyidae) from the Mediterranean, with notes, lectotype designations and a key to the species from the West Palaearctic. *Studia dipterologica* **5**(1), 19-29.

Ebejer, M.J. 2005. A contribution to the knowledge of the Chyromyidae (Diptera) of Italy with a description of a new species of *Aphaniosoma* Becker. *Revue Suisse de Zoologie* **112**, 859-867.

Ebejer, M.J. 2006. New species of *Aphaniosoma* Becker (Diptera, Chyromyidae) from Central Asia. *Studia dipterologica* **10**(1), 249-296.

Ebejer, M.J. 2009. A revision of Afrotropical Chyromyidae (excluding *Gymnochiromyia* Hendel) (Diptera: Schizophora), with the recognition of two subfamilies and the description of five new genera. *African Invertebrates* **50**(2), 321-434.

Ebejer, M.J. and Báez, M. 2001. Chyromyidae (Diptera, Schizophora) from the Canary Islands and Madeira, with descriptions of new species. *Studia dipterologica* **8**(1), 289-301.

Gibbs, D. 2007. The genus *Chyromya* Robineau-Desvoidy (Diptera, Chyromyidae) in Britain, with description of a new species. *Dipterists Digest* (*Second Series*) **14**, 13-22.

Martinek, V. 1999. *Chyromyidae* p144. **In** Schumann, H. Bährmann, R. and Stark, A. (Eds). Entomofauna Germanica 2. *Checkliste der Dipteren Deutschlands.* Studia dipterologica supplement **2**. Halle (Saale) 354 pp.

Merz, B. 1997. Die Megamerinidae, Strongylophthalmyiidae, Pseudopomyzidae, Chyromyidae und Camillidae der Schweiz (Diptera, Acalyptrata). *Mitteilungen Entomologische Gesellschaft Basel* **47**(4), 130-138.

Stuke, J-H. 2008. Die artenarmen Familien der acalyptraten Zweiflügler in Niedersachsen und Bremen (Diptera: Acalyptratae). *Drosera* 77-106.

Tschirnhaus, M. von. 2007. Acalyptrate Fliegen (Diptera: Schizophora, "Acalyptratae") der jungen Düneninseln Memmert und Mellum unter besonderer Berücksichtigung der Agromyzidae und Chloropidae – Ergebnisse der Untersuchungen von 1984–1986 und 1994. *Drosera* 99–136.

Tschirnhaus, M. von. 2008. Die acalyptraten Fliegen der Ostfriesischen Inseln (Diptera: Schizophora, "Acalyptratae". Kritisches Artenverzeichnis anhand von Literatur-daten, Neufunden und unter Mitarbeit von Fachkollegen. *Schriftenreihe Nationalpark Niedersächsisches Wattenmeer* **11**, 373–390.

Withers, P. 2008. *Chyromya britannica* Gibbs (Diptera, Chyromyidae) present in France. *Dipterists Digest* (*Second Series*) **14**, 98.

Dipterists Digest 2010 **17**, 13-16

Paradelphomyia czizekiana Starý (Diptera, Limoniidae) in England

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Summary
Records for *Paradelphomyia czizekiana* Starý, 1971, including the first recognised in Britain, are given for Herefordshire, Derbyshire, Dorset and Norfolk. The habitats included mainly unshaded fen, reedbed and seepages, some of which were strongly calcareous or brackish. Diagnostic features of the male genitalia are figured.

Introduction

Paradelphomyia is a genus of small craneflies found in various types of wetlands as their larvae are aquatic (see, for example, Brindle 1967). Chandler (1998) listed five species to which Coe (in Coe *et al.* 1950) provided a key. As other species are likely to be found in Britain, Stubbs (1997) included *Paradelphomyia czizekiana* Starý, 1971, and *P. nigrina* (Lackschewitz) in his test keys to the genus.

In 2002 we undertook a survey of the Diptera of Moccas Park, Herefordshire, for English Nature (Godfrey and Drake 2003). We recognised *Paradelphomyia czizekiana* using the genitalia figures in Stubbs (1997), and Dr Jaroslav Starý kindly verified the identification. On the basis of this record, the presence of *P. czizekiana* in Britain was noted in Oosterbroek (2010), Chandler (2008) and Drake (2009). Here we give more background to its addition to the British list.

Distribution and habitats

We have found the species at several places in England. The original specimens from Moccas Park (SO3342, SO3441) were taken beside small unshaded streams and from unshaded seepages, some of which were strongly calcareous but others were not obviously so. Many records were obtained from fens in Norfolk Broadland where it sometimes occurred with the common and widespread *P. senilis* (Haliday). There was a substantial population at Strumpshaw Fen (TG3306) in the Yare valley, and smaller numbers at Upton Fen (TG3813) in the Bure valley, Reedham Fen (TG3619), Little Reedham Fen (TG3618) and Sutton Fen (TG3723) in the Ant valley, and Hickling Broad (TG4122, TG4221) and Heigham Sound (TG4320) north of the Thurne valley. Water in the ditches or broads next to sampled reedbeds at Hickling and Heigham was slightly but distinctly brackish, indicated by conductivity readings in the range 4.94-5.85mS cm^{-1} (corresponding to about 8-10% sea water). The vegetation of most of these fens was dominated by tall reed (*Phragmites*), usually together with other fen vegetation, on saturated peat and sometimes with pools. Only the Sutton Fen locality was within carr with pools, although there was extensive carr nearby at Strumpshaw and Upton fens. In Dorset it was found at Aunt Mary's Bottom SSSI (ST5402), in a patch of wet neglected pasture next to carr and wet woodland, but not within the extensively sampled wood itself which supported a rich assemblage of carr-associated craneflies. Nearby in Dorset at Poorton Vale *P. czizekiana* was found in *Carex paniculata* fen

with adjacent shaded seepages in a wet valley bottom. It was also swept from Lees Bottom, Monsal Dale (SK1770), Derbyshire. This site comprised rich fen on Carboniferous Limestone with substantial communities of *Blysmus*, *Carex echinata*, *C. lepidocarpa* and *Pinguicula vulgaris*. The only information on its habitat from outside Britain appears to be the study by Reusch (2006), who caught *P. czizekiana* in an emergence trap set in unshaded wet calcareous *Schoenus*-dominated fen in Bavaria, southern Germany. It appears that *P. czizekiana* is found predominantly in unshaded wetlands, often with dense reed or sedge, but which otherwise span a wide ecological range from slightly brackish to fresh fen, and neutral to highly calcareous seepages.

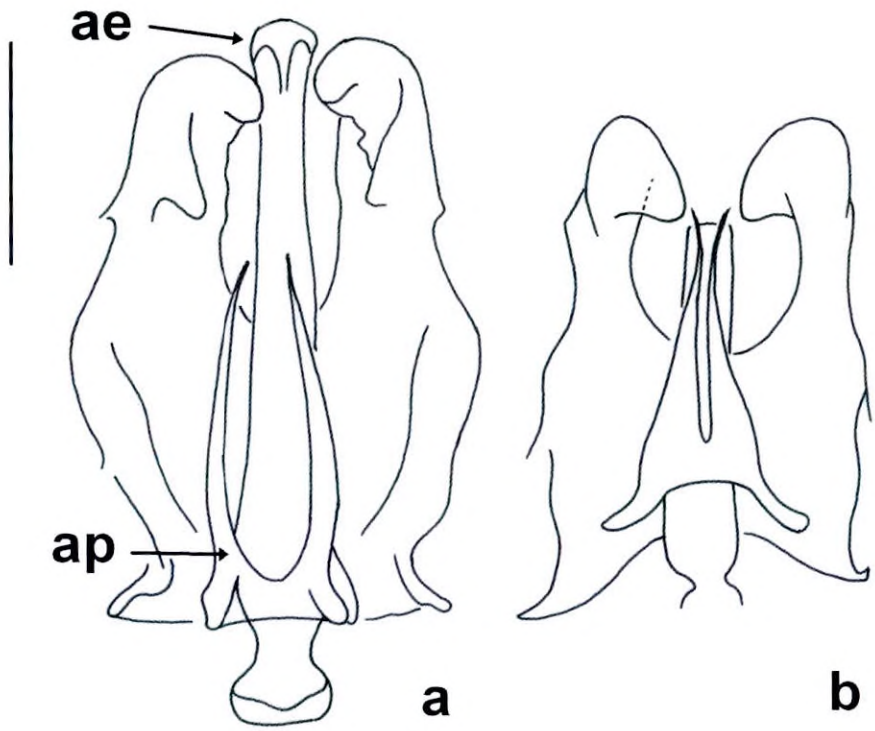

Fig. 1. Male genitalia of a) *Paradelphomyia czizekiana* Starý and b) *P. senilis* (Haliday) in ventral view. ae – aedeagus, ap – apodeme. Scale line = 0.1mm.

Our limited information suggests that *P. czizekiana* may be widespread in England and possibly Wales, and have a less western and northern bias than the more infrequent species *P. ecalcarata* (Edwards) and *P. nielseni* (Kuntze) shown in the distribution maps of the National Biodiversity Network Gateway (2010). We note that there is some confusion in Britain over the application of the names *P. dalei* (Edwards) and *P. fuscula* (Loew) (Dr Jaroslav Starý, *pers. comm.*) so the NBN maps for these species may not be accurate. Abroad *P. czizekiana* is known from Bulgaria, the Czech Republic, Germany, Slovakia, Switzerland and Ukraine

(Oosterbroek 2010). The dates of our captures are nearly all from mid June to early July but with one from 10 October. All the records have been submitted to the national recording scheme for craneflies.

Identification

The species was described as new to science by Starý (1971), who provided good figures of the male genitalia as well as a full description of the species. The genitalia distinguish *P. czizekiana* unambiguously: the two prongs of the apodeme lying below the tube-shaped aedeagus are inwardly curved, rather than parallel or outwardly curved as in *P. senilis* and *P. fuscula* (Loew) (Fig. 1, and Coe, 1950). The apodeme is about or slightly over half the length of the aedeagus, which protrudes well beyond it, whereas the apodeme and aedeagus end at approximately the same point in the two species just mentioned. These tiny features can often be seen through an oval translucent 'window' at the rear of the last sternite when it is wetted in alcohol, and we find this the quickest way to determine *Paradelphomyia*.

Paradelphomyia czizekiana and *P. senilis* are both dark brown species with a more or less uniformly brown thoracic dorsum and genitalia, thus distinguishing them from *P. ecalcarata* (Edwards), *P. fuscula* and *P. nielseni* (Kuntze), which have obviously yellow thoraces with indications of stripes, and clearly pale genitalia. The pleural stripes that give the genus its characteristic brown-yellow-brown pattern are more clearly demarcated in *P. senilis* than in *P. czizekiana*, in which the upper margin of the sternopleural (katepisternal) mark is diffuse. Specimens identified using these colour characters need to be confirmed by examining the genitalia.

Acknowledgements

We thank Dr Jaroslav Starý for confirming the identification of the first specimens and for commenting on the identity of *P. dalei* and *P. fuscula*. English Nature is thanked for funding the surveys of Moccas Park and Derbyshire Dales, and The Broads Authority, Natural England and the Royal Society for the Protection of Birds for funding work resulting in the Norfolk records.

References

Brindle, A. 1967. The larvae and pupae of the British Cylindrotominae and Limoniinae (Diptera, Tipulidae). *Transactions of the Society for British Entomology* **17,** 151-216.

Chandler, P.J. 1998. A check list of insects of the British Isles (New Series). Part 1: Diptera. *Handbooks for the Identification of British Insects* **12.**

Chandler, P.J. 2008. (as Editor) Corrections and changes to the Diptera checklist (19). *Dipterists Digest (Second Series)* **15,** 16-19.

Coe, R.L., Freeman, P. and Mattingly, P.F. 1950. Diptera 2. Nematocera: families Tipulidae to Chironomidae. *Handbooks for the Identification of British Insects* **9** (2), 1-216. Royal Entomological Society of London.

Drake, C.M. 2009. Some fenland flies from Norfolk Broadland. **In** Dipterists Day Exhibits 2008 – compiled by editor from exhibitors' notes. *Dipterists Digest (Second Series)* **16,** 53-56.

Godfrey, A. and Drake, C.M. 2003. *Diptera survey of Moccas Park NNR, Herefordshire.* Unpublished report to English Nature, Ledbury. 147pp.

National Biodiversity Network's Gateway 2010. http://data.nbn.org.uk [accessed January 2010].

Oosterbroek, P. 2010. *Catalogue of the craneflies of the World (Diptera, Tipuloidea: Pediciidae, Limoniidae, Cylindrotomidae, Tipulidae)*. On-line catalogue at nlbif.eti.uva.nl/ccw [accessed 2010; original record of *Paradelphomyia czizekiana* appeared in 2006]

Reusch, H. 2006. Stelzmücken (Diptera: Limoniidae et Pediciidae) im Kalkquellmoor "Benninger Ried" bei Memmingen, Bayern. *Lauterbornia* **57**, 133-136.

Starý, J. 1971. Revision der Aarten der Unterfamilie Limoniinae (Tipulidae, Diptera) aus den Sammlungen des Mährischen Museums in Brno mit besonderer Berücksichtigung der Fauna Mährens. Teil II: Tribus Hexatomini und Eriopterini. *Časopis Moravského Musea*. **55**, 133-194.

Stubbs, A.E. 1997. Test key to subfamily Limnophilinae. *Cranefly Recording Scheme Newsletter*. Dipterists Forum. [available from www.dipteristsforum.org.uk]

***Campiglossa producta* (Loew, 1844) (Diptera, Tephritidae) new to Ireland** – Among Irish Diptera collected in recent years by JPOC and referred to PJC for identification was a single male of *Campiglossa producta* (Loew, 1844), which was the first record of this species from Ireland. This specimen was collected at Dunmore East (X6999), Co. Waterford, 9.viii.2006, from marine cliffs near the village.

This species may be identified from the handbook to the British species by I.M. White (1988. Tephritid flies. Diptera: Tephritidae. *Handbooks for the Identification of British Insects* **10**(5a): 1-134. Royal Entomological Society of London), who stated that there were old records from coastal areas of south-east England and East Anglia, but that there was only one confirmed recent record from Kent. However, since then and particularly from 1998 onwards *C. producta* has been recorded more frequently again, with 21 post 1988 localities scattered along the east and south coasts of England, from Norfolk to the north coast of Cornwall with a concentration of records (11) from Dorset, and also including some inland records in Surrey, Sussex and the breckland area of Suffolk (Laurence Clemons *pers. comm.*). About half of these records are shown on the map in the latest published atlas of British Isles Tephritidae (Clemons, L. 2004. *A provisional atlas of the Tephritidae (Diptera) of Britain and Ireland*. Version 2. (distributed with *Bulletin of the Dipterists Forum* No. 57), of which an updated version is available on the Dipterists Forum website. The recent inland records may suggest that like some other species of Tephritidae it is extending its range due to climatic changes.

In view of the restricted British distribution this was not a species expected to occur in Ireland. However, the area and habitat in which it was found were the most likely situation for it to turn up and it should be sought in other suitable habitats on the south-east coast of Ireland

In common with many species of Tephritidae, *C. producta* develops in flower-heads of composite flowers (Asteraceae). There are continental rearing records from species of the genera *Sonchus, Hypochoeris, Crepis, Taraxacum* and *Leontodon*, but it has yet to be reared in the British Isles. Several potential foodplants were probably present at the Dunmore East site - **P.J. CHANDLER,** 606B Berryfield Lane, Melksham, Wilts SN12 6EL, U.K. and **J.P. O'CONNOR,** National Museum of Ireland, Kildare Street, Dublin 2, Ireland

Four species of Diptera (Ceratopogonidae, Ephydridae and Calliphoridae) new to Ireland – Among miscellaneous Diptera collected in recent years by JPOC and referred to PJC for identification were six species new to Ireland, of which two are recorded in separate notes elsewhere in this issue. The four species reported here are common in Britain, but belong to genera that have been poorly studied in Ireland

Forcipomyia brevipennis (Macquart, 1826) (Ceratopogonidae). A male and a probable female were collected at Dunmore East (X6999), Co. Waterford, 9.viii.2006, from vegetation on marine cliffs. This species develops in cow and horse dung.

Scatella tenuicosta Collin, 1930 (Ephydridae). Some specimens were collected at the same site as the preceding species on a subsequent visit on 2.viii.2007. It was also found at Lough Muckno (H8320), Co. Monaghan, on 2.iv.2007. Species of *Scatella* are most often found on mud at the margin of ponds and lakes.

Pollenia angustigena Wainwright, 1940 (Calliphoridae). A male was found at Clodiagh Bridge (S6735) on the Clodiagh River, Co. Kilkenny, 11.viii.2006. This and the following species are part of the *P. rudis* (Fabricius, 1794) complex, of which the larvae are parasitoids of earthworms. Other specimens in collections under the name *P. rudis* have yet to be revised.

Pollenia pediculata Macquart, 1834 (Calliphoridae). One male was collected at the same time and place as the above-mentioned specimen of *P. angustigena*. A second male was caught at Bannow Bay, near Fethard-on-Sea (S7807), Co. Wexford, 4.viii.2007.

All of these species are probably widespread in Ireland - **P.J. CHANDLER,** 606B Berryfield Lane, Melksham, Wilts SN12 6EL, U.K. and **J.P. O'CONNOR,** National Museum of Ireland, Kildare Street, Dublin 2, Ireland

Four species of *Phytomyza* Fallén (Diptera, Agromyzidae) new to the Irish list – This note adds four overlooked species of common agromyzids to the Irish list of Diptera, with brief notes on a fifth species, and their parasitoids.

(1) *Phytomyza aquilegiae* Hardy, 1849: 60 specimens reared from mines on common columbine *Aquilegia vulgaris* [no parasitoids], collected on 12 June 1985 at Castlecurragh, Co. Limerick;

(2) *Phytomyza leucanthemi* Hering, 1935: 8 specimens reared from mines on oxeye daisy *Leucanthemum vulgare* [plus one parasitoid, *Colastes braconius* Haliday, 1833 (Hymenoptera, Braconidae)], same data as (1);

(3) *Phytomyza artemisivora* Spencer, 1971: 144 specimens reared from mines collected on mugwort *Artemisia vulgaris* [plus one parasitoid, a damaged *Dacnusa* sp (Hymenoptera, Braconidae)], on 11 June 1985 at Tralee, Co. Kerry;

(4) *Phytomyza spinaciae* Hendel, 1935: 1 specimen reared from mines collected on meadow thistle *Cirsium dissectum* [plus one parasitoid, *Hemiptarsenus unguicellus* (Zetterstedt, 1838) (Hymenoptera, Eulophidae)], on 13 June 1985 at Lough Corrib, Co. Galway;

(5) the boreal-alpine species *Phytomyza alpina* Groschke, 1957 is already recorded from the Burren, Co. Clare (Spencer, K.A. 1972. *Agromyzidae*. Handbooks for the Identification of British Insects, Royal Entomological Society). In June 1985, it was an abundant leaf-miner on ragwort *Senecio jacobaea* growing in the limestone pavement

[locality not given] and a collection of mines produced 46 flies and 25 specimens of what I believe is an undescribed species of *Chorebus* (Hymenoptera, Braconidae) – **H.C.J. GODFRAY,** Department of Zoology, South Parks Road, Oxford OX1 3PS

***Phytomyza soenderupi* Hering, 1941 (Diptera, Agromyzidae) new to the Irish list –** Among some Diptera collected by JPOC and referred to PJC for identification, was a male of *Phytomyza soenderupi* Hering, 1941. This specimen was caught at Lough Ballynafid (N409608), Co. Westmeath on 5 May 1987. This is one of three *Phytomyza* species in the British Isles fauna of which the foodplant is marsh marigold *Caltha palustris*. These three species are closely related and have similar structure of the male genitalia but differing in details of the aedeagus and may be identified using the work of K.A. Spencer (1976. The Agromyzidae (Diptera) of Fennoscandia and Denmark. *Fauna Entomologica Scandinavica* **5**(2), 305-606). Only one of these, *P. calthophila*, Hendel has been previously recorded from Ireland. The latter species and *P. calthivora* Hendel are leaf miners, but *P. soenderupi* is a stalk miner that pupates internally.

Phytomyza soenderupi was added to the British list in the 1998 checklist, based on records known to D.A. Smith and D.J. de C. Henshaw. It was then formally added to the list by K.P. Bland (2001. Agromyzid flies (Diptera: Agromyzidae) new to Britain. *Glasgow Naturalist* **23,** 49-50) on specimens from Scotland, Yorkshire and Cumbria, that had been reared from puparia found in flower stalks of *C. palustris*; he noted that no evidence was found of it developing in leaf petioles as described by Spencer (*op. cit.*). The earlier British records were as follows: Suffolk, Leiston, leg. A.G. Irwin; Essex, Norwood End, week 23/1980, water trap, leg. D.J. de C. Henshaw; Essex, The Mores (TQ565966), 25.v.1983, 1♂, swept in small wood with *C. palustris* present, leg. D.A. Smith; North Yorkshire, Malham Tarn, 11.v.1981, leg. D.J. de C. Henshaw; Aberdeenshire, Milltown (NJ665280), 6.vi.1996, 1♂ and 17.vii.1999, 1♂, Malaise trap, leg. D.A. Smith.

It is clearly a widespread species in Britain that has earlier been overlooked and may prove to be equally widespread in Ireland. Variation in the ratio between the second and fourth costal sectors was noted by D.A. Smith, in that some specimens do not run to this species in the key by Spencer (*op. cit.*). In that key whether the second section is more or less than three times as long as the fourth section is a character that separates it from the other species on *Caltha* which have it less than three times, while *P. soenderupi* is described as having it three and a third times as long. The Irish specimen has the second sector three times as long as the fourth while a specimen collected by D.A. Smith has it nearer 2.7 times. The male genitalia are similar in structure and this is concluded to be infraspecific variation. There is no clear separation in proportions in this character as a specimen with the ratio exactly three times could go either way in the keys.

We are grateful to David Henshaw and Del Smith for information and kindly permitting us to publish their records - **P.J. CHANDLER,** 606B Berryfield Lane, Melksham, Wilts SN12 6EL, U.K. and **J.P. O'CONNOR,** National Museum of Ireland, Kildare Street, Dublin 2, Ireland

Dipterists Digest 2010 **17**, 19-22

Cheilosia ranunculi Doczkal and *Sphaerophoria bankowskae* Goeldlin de Tiefenau (Diptera, Syrphidae) new to Scotland

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Summary
Cheilosia ranunculi Doczkal and *Sphaerophoria bankowskae* Goeldlin de Tiefenau are newly recorded for Scotland. For both species these records extend their northern distributions in Britain.

Introduction

Doczkal (2000) found within specimens named as the common and widespread European eristaline hoverfly species, *Cheilosia albitarsis* (Meigen, 1822) a new species that he named *Cheilosia ranunculi*. The fact that *C. albitarsis* consisted of more than one species had been suspected for some time (Gibbs 2000). The specific name of the new species is in reference to its apparent preference in visiting flowers of Ranunculaceae and Doczkal (2000) speculated that, like *C. albitarsis*, *C. ranunculi* may develop in these plants. In Europe *C. ranunculi* is known from the Balkan Peninsula, Bulgaria, England, France, Germany, Hungary, Italy, Spain, Switzerland and Romania (Doczkal 2000, Bartsch 2009b). In Britain, *C. ranunculi* is widespread in southern and central England extending as far north as Cumbria (Ball and Morris, 2010).

Sphaerophoria bankowskae was one of four new Palaearctic species described by Goeldlin de Tiefenau (1989). Originally described from specimens obtained from Denmark, Sweden and Switzerland, it is additionally known from England, Finland, France, Germany and Italy (Bartsch 2009a). In Britain, *S. bankowskae* is apparently only known from three records (Ball and Morris 2010). Colin Plant recorded the first British specimen of this hoverfly from north Essex based on a male taken on 9.vii.1986 (Plant 1990) and since then, two other records are known, one from Northamptonshire in 1990 and the other from Sussex in 2004 (Ball and Morris 2010).

We have discovered specimens of both these species in Scotland and the records are reported here.

Cheilosia ranunculi Doczkal, 2000

Specimens of *C. albitarsis* in the collections of the National Museums of Scotland were examined and males separated from females. Unfortunately females of *C. ranunculi* cannot be identified at present and were set aside. The identity of each of the 57 males was determined using the key and descriptions in Doczkal (2000). We found 9 males that came out in the key as *C. ranunculi* and fitted the description of this species. Three of these are from England and six are from Scotland.

England: 1 male, Lincolnshire, South Leverton, unknown date in May 1897, Rev. A. Thornley; 1 male, Berkshire, Farnham Royal, 6.v.1933, taken at *Ranunculus acris*

(Ranunculaceae), E.B. Basden; 1 male, Cumbria, Brampton, nr Carlisle, 1.vi.1980, Sir A.B. Duncan.

Scotland: 1 male, ex Greville collection, no other data but probably collected between 1816 and 1858 from Dalmeny Park, nr Edinburgh; 4 males, Dumfries-shire, Tynron, 19.v.1945, Sir A.B. Duncan; 1 male Dumfries-shire, Portling, 1.vi.1980, Sir A.B. Duncan.

***Sphaerophoria bankowskae* Goeldlin de Tiefenau, 1989**

In 2008 during fieldwork in Glen Affric, Highland Region, a male *Sphaerophoria* was swept from a damp meadow. In the keys of Stubbs and Falk (2002) and Bartsch (2009a), it came out as *S. bankowskae*. The specimen was checked against the original description of the species (Goeldlin de Tiefenau 1989), with which it agreed in nearly all details and finally, a male identified as *S. bankowskae* by Martin Speight was borrowed from Colin Plant and compared with the Affric specimen. The two specimens agreed in their characters, including the male genitalia. The collection of male *Sphaerophoria* in the National Museums of Scotland was checked but no additional specimens of *S. bankowskae* were found.

Scotland: 1 male, Highland Region, Glen Affric, swept from damp meadow near Dog Falls, NH288285, 28.vi.2008, G.E. Rotheray.

Discussion

In 1858 the Edinburgh College Museum, later to become the Royal Scottish Museum and now known as the National Museums of Scotland, acquired from Dr Robert Kaye Greville (1794-1866) a collection of British insects in 30 large boxes (Grimshaw 1915). Dr Greville was born at Bishop Auckland, Durham and in 1816, moved to Edinburgh where he remained for the rest of his life. Better known as a botanist, Greville nonetheless collected insects assiduously but published very little on them. According to Grimshaw (1915) his specimens were very well set with the wings and legs arranged with 'extreme care and symmetry'. This is not quite the case with his specimen of *C. ranunculi* in which all but the front legs are folded under the body. Unfortunately, the apical three segments of the right hand tarsi are missing but this may have happened at a later date. Greville attached no data labels to his specimens but according to the 1845 *New Statistical Account* **2**, 93-4, quoted by Grimshaw (1915), Greville collected most of his insect specimens from Dalmeny Park (NT1578), near Edinburgh. On the basis of this information, the specimen of *C. ranunculi* is likely to have been collected by Greville at Dalmeny Park sometime between 1816 and 1858.

In the collections of the National Museums of Scotland, we found another 19th century specimen of *C. ranunculi*, collected in 1897 by the Rev A. Thornley from South Letherton just north-west of Lincoln in Lincolnshire. Whether these records represent the oldest known specimens of this species is unknown, but they establish that the species is not a recent addition to the British fauna but has probably been present for a long time, and has been widespread in Britain for a long period. Nonetheless, being a recently recognised species, *C. ranunculi* is probably under-recorded both in Europe and in the British Isles.

In early summer, *C. albitarsis* oviposits low down on the stems of *R. acris* and first stage larvae tunnel into the base of the plant but do not develop further than the first or second stage. In developmental diapause, first and second stage larvae are extremely difficult to spot in the developing root/stem collars just underground at the base of the plant. The only sign of their presence is a tiny, red-brown, stellate-shaped, spiracular plate at the open end of the tunnel. In the autumn larvae come out of diapause and grow rapidly and in 2-3 weeks leave

the plant and overwinter in the soil as puparia (Rotheray 1991). This pattern of development ensures that the period of maximum larval growth matches the time when the root is at its largest size. The extent to which such a life cycle is shared by *C. ranunculi* is unclear as is the extent to which they share foodplants. Doczkal (2000) noted that both species can be seen flying together but suggests that the foodplant of *C. ranunculi* may be *Ranunculus bulbosus*. Resolving these matters should not prove difficult if a population of *C. ranunculi* can be located.

In Britain, *S. bankowskae* is only known from a handful of records (Ball and Morris 2010). Like *C. ranunculi* it is a comparatively recently recognised species but has been known for almost double the time and the relative lack of records compared to *C. ranunculi* suggests that, even if under-recorded, it is a much rarer species in Britain. The record from Glen Affric greatly extends the British distribution of *S. bankowskae* from southern England into northern Scotland.

According to Bartsch (2009a), in Scandinavia *S. bankowskae* is a species of woodland glades and damp meadows in birch (*Betula*) and spruce (*Picea*) forest up to an altitude of about 600m. The woodlands of Glen Affric are primarily of pine (*Pinus sylvestris*), with smaller amounts of birch. Spruce is not a native British tree but otherwise the record from Glen Affric fits the characteristics of the species in Finland and Sweden. Bartsch (2009a) records various plants for *S. bankowskae* adults of which *Potentilla* is the most common at Glen Affric.

Whether *S. bankowskae* is one of those unusual species with a disjunct distribution in Britain, with northern and southern populations and nothing in between cannot yet be determined. There is the possibility that it is a vagrant species, meaning that it occasionally migrates as far as Britain but, in any one locality, does not form residential populations for more than a few years, perhaps because environmental conditions are not favourable to such species. Hoverflies that appear to be vagrants in Britain include *Eupeodes lundbecki* (Soot-Ryen) and possibly *Didea alneti* (Fallén). Bartsch (2009a) referred to the possibility of *S. bankowskae* being a migrant species in Scandinavia. In the Alps however, no evidence exists that *S. bankowskae* migrates (M.C.D. Speight *pers. comm.*). Only additional recording will resolve these issues and clarify the British status of *S. bankowskae*.

Acknowledgements

GER is grateful to Alan Featherstone Watson of *Trees for Life* for arranging access enabling recording work to be carried out in Glen Affric. We are also grateful to Colin Plant for the loan of a specimen of *S. bankowskae* and to Keith Bland, David Robertson and Richard Lyszkowski and Martin Speight for helpful discussions and information and to Richard for helping with translations.

References

Ball, S. and Morris, R. 2010. *Hoverfly Recording Scheme Maps* www.hoverfly.org.uk

Bartsch, H. (Ed.). 2009a. *Tvåvingar: Blomflugor, Diptera: Syrphidae: Syrphinae. Nationalnyckeln till Sveriges Flora och Fauna*. Artdatabanken lantbruksuniversitet, Uppsala.

Bartsch, H. (Ed.). 2009b. *Tvåvingar: Blomflugor, Diptera: Syrphidae: Eristalinae & Microdontinae. Nationalnyckeln till Sveriges Flora och Fauna*. Artdatabanken lantbruksuniversitet, Uppsala.

Doczkal, D. 2000. Description of *Cheilosia ranunculi* spec. nov. from Europe, a

sibling species of *C. albitarsis* Meigen (Diptera, Syrphidae). *Volucella* **5**, 63-78.
Gibbs, D. 2000. Are there two species confused under *Cheilosia albitarsis*? *Hoverfly Newsletter* **30**, 4-5.
Goeldlin de Tiefenau, P. 1989. Sur plusieurs espèces de *Sphaerophoria* (Dipt., Syrphidae) nouvelles ou méconnues des régions paléarctique et néarctique. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*. **62**, 41-66.
Grimshaw, P.H. 1915. The Greville collection of Chalcididae and Proctotrypidae in the Royal Scottish Museum, with some references to Walker's types. *Scottish Naturalist* **No 48**, 344-351.
Plant, C.W. 1990. *Sphaerophoria bankowskae* Goeldlin, 1989 (Syrphidae) recorded in mainland Britain. *Dipterists Digest (First Series)* **3**, 32-33.
Rotheray, G.E. 1991. Larval stages of 17 rare and poorly known British hoverflies (Diptera: Syrphidae) *Journal of Natural History* **25**, 945-969.
Stubbs, A.E. and Falk, S. 2002. *British Hoverflies: an illustrated identification guide*. British Entomological and Natural History Society, Reading.

Corrections and changes to the Diptera Checklist (22) – Editor

It is intended to publish here any corrections to the text of the latest 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. Changes are listed under families; names new to the British Isles list are in bold type. The notes below refer to removal of one doubtfully recorded species and addition of 9 species, resulting in a new total of **7022** species.

Corrections

Page 175. The correct date for the description of *Helina impuncta* (Fallén) is 1824, not 1825.

Changes

Mycetophilidae. The following introduced species is added in the present issue:
Sciophila ***fractinervis*** Edwards, 1940

Cecidomyiidae. The following introduced species is added in the present issue:
Dasineura ***oxycoccana*** (Johnson in Skinner, 1899 – *Cecidomyia*)

Ceratopogonidae. Several changes to the nomenclature of British species of *Dasyhelea* and one in *Forcipomyia* have resulted from **a** paper by P. DOMINIAK and R. SZADZIEWSKI (2010. Distribution and new synonymy in European biting midges of the genus *Dasyhelea* Kieffer (Diptera: Ceratopogonidae). *Zootaxa* **2437,** 1-37). This work did not recognise subgenera and the subgenus to which each species is assigned here follows previous literature:
Dasyhelea (*Prokempia*) ***bilobata*** Kieffer, 1915 (= *D. luteiventris* Goetghebuer, 1934, new synonym)
Dasyhelea (*Dasyhelea*) ***bilineata*** Goetghebuer, 1920 (= *D. saxicola* (Edwards, 1929), new synonym; it is confirmed that the species that develops in pools on limestone pavement is the same species that develops in other small bodies of water including teasel *Dipsacus* leaf-axils)

Dasyhelea (*Pseudoculicoides*) ***calycata*** Remm, 1972 (= *D. neobifurcata* sensu European authors, not *D. neobifurcata* Wirth, 1976, which is a Nearctic species)
Dasyhelea (*Dicryptoscena*) *notata* Goetghebuer, 1920 is considered doubtfully British, as the records by Edwards only referred to females, which cannot be reliably determined. It should be removed to the Excluded species category.
Forcipomyia (*Panhelea*) ***aristolochiae*** (Rondani, 1860 – *Ceratopogon*) (= *F. brevicubitus* Goetghebuer, 1920, new synonym)

Chironomidae. The first of four volumes of *A World Catalogue of Chironomidae (Diptera)* by P. ASHE and J.P. O'CONNOR, was published by the National Museum of Ireland on 31 December 2009: Part 1. Buchonomyiinae, Chilenomyiinae, Podonominae, Aphroteninae, Tanypodinae, Usambaromyiinae, Diamesinae, Prodiamesinae and Telmatogetoninae. The following changes to the British Isles list result (listed under the subfamilies concerned):

DIAMESINAE

Potthastia longimanus Kieffer, 1922 [originally described in *Potthastia* so parentheses removed]
PSEUDODIAMESA Goetghebuer in Goetghebuer & Lenz, 1939 [emended authorship]
PSEUDOKIEFFERIELLA Zavřel, 1941[not an unavailable name]

PODONOMINAE

Paraboreochlus maritimus (Strobl, 1895) [date corrected from 1894]

TANYPODINAE

CLINOTANYPUS [British species are in Subgenus CLINOTANYPUS]
PSECTROTANYPUS [no subgenera recognised]
[? *zonatus* is not a synonym of *P. varius*, but nomen dubium in Tanypodinae]
Natarsia punctata (Fabricius, 1805) [authorship corrected from Meigen, 1804]
Arctopelopia griseipennis (van der Wulp, 1859) [date corrected from 1858]
Paramerina cingulata (Walker, 1856) [authorship corrected from Stephens in Walker, as Stephens had no part in the description]
[also *cingulata* is an available name, not preoccupied in *Chironomus*, as these names have been used in different genera since at least 1899]
Procladius ***simplicistylus*** Freeman, 1948 [corrected from *simplicistylis*, which was an incorrect subsequent spelling]
TANYPUS [British species are all in subgenus TANYPUS sensu stricto]

TELMATOGETONINAE

TELMATOGETON Schiner, 1867 [date corrected from 1866]

Phoridae. It was overlooked that R.H.L. DISNEY (1999. A troublesome sibling species complex of scuttle flies (Diptera: Phoridae) revisited. *Journal of Natural History* **33,** 1159-1216) also added the following species to the British list:
Megaselia ***petraea*** Schmitz, 1934

A species described in D. WEINMANN and R.H.L. DISNEY (1997. Two new species of Phoridae (Diptera) whose larvae associate with large spiders (Araneae: Theraphosidae). *Journal of Zoology, London* **243,** 319-328) has been found in Britain (Henry Disney *pers. comm.*) and is an introduced species:
Megaselia ***dimorphica*** Disney, 1997

R.H.L. DISNEY (2010. Scuttle flies (Diptera: Phoridae) reared from logs in Finland and N.W. Russia, including two new species. *Entomologica Fennica* **20**(2009), 257-267) added the following species:
Megaselia ***tignorum*** Disney, 2010

R.H.L. DISNEY (2010. *Borophaga bennetti* Disney, 2010. A new species of *Borophaga* Enderlein (Dipt., Phoridae) from the Isle of Man. *Entomologist's monthly Magazine* **146,** 57-61):
Borophaga ***bennetti*** Disney, 2010

Canacidae. A world catalogue has appeared: L. MUNARI and W.N. MATHIS (2010. World Catalog of the Family Canacidae (including Tethinidae) (Diptera), with keys to the supraspecific taxa. *Zootaxa* **2471,** 1-84). The Irish checklist was overlooked and Ireland was omitted from the distribution of two species (*Pelomyiella mallochi* and *Tethina grisea*). The only nomenclatural change affecting the British list is that subgenera are not recognised in *Tethina*, *Rhicnoessa* being treated as a synonym.

Sphaeroceridae. L. PAPP (2008. New genera of the Old World Limosininae (Diptera, Sphaeroceridae). *Acta Zoologica Academiae Scientiarum Hungaricae* **54,** Suppl. 2, 47-209) has proposed the raising of subgenera of *Spelobia* to generic rank, resulting in the following new combinations:
BIFRONSINA *bifrons* (Stenhammar. 1855 – *Limosina*)
EULIMOSINA *ochripes* (Meigen, 1830 - *Borborus*)

Anthomyiidae. The following changes result from V. MICHELSEN (2010. Fauna Europaea: Anthomyiidae. **In** Pape, T. (Ed.), Diptera Brachycera. Europaea version 2.2. http://www.faunaeur.org) (Michael Ackland *pers. comm.*, see paper in present issue):
Alliopsis *longiceps* (Ringdahl, 1935 – *Hylemyia*) (senior synonym of *A. austriaca* (Hennig, 1976 - *Paraprosalpia*) and *A. sitiens* (Collin, 1943))
Botanophila ***discreta*** (Meigen, 1826 – *Anthomyia*) (new to Britain, previously confused with *B. striolata*)
Botanophila ***estonica*** (Elberg, 1970 – *Hylemyia*) (= *B. varicolor*: authors, misident. and of British list)
Botanophila rupicapra (Mik, 1887 – *Chortophila*) (= *B. alligata* (Huckett, 1965 – *Hylemya* (*Botanophila*)), = *B. flavisquama* (Stein, 1906), = *B. gnavula* (Hennig, 1970))
Botanophila ***varicolor*** (Meigen, 1826 – *Anthomyia*) (= *B. odontogaster* (Zetterstedt, 1845))
Delia lophota Pandellé, 1900 (= *D. nuda* (Strobl, 1901 – *Hylemyia*)
Pegomya vanduzeei (Malloch, 1919 – *Pegomyia*) (= *P. versicolor*: authors, misident. and of British list)
Pegoplata annulata (Pandellé, 1899 – *Anthomyia* (*Hylemyia*)) (= *P. virginea*: authors, misident., = *P. nitidicauda* (Schnabl in Schnabl & Dziedzicki, 1911 – *Pegomyia*)) [not a subspecies of *P. juvenilis*, but a distinct species]

V. MICHELSEN (2007. Taxonomic review of Eurasian *Paradelia* Ringdahl (Diptera: Anthomyiidae) with descriptions of two new species. *Zootaxa* **1592**, 1-44) proposed the following change:
Paradelia ***hedgreni*** (Ringdahl, 1959 – *Pseudonupedia*) (= *P. setinerva*: authors, misident. and of British list, true *setinerva* is syn. of *palliceps* (not British)

V. MICHELSEN and D.M. ACKLAND (2009. The *Pegomya maculata* species group (Diptera Anthomyiidae) in Europe, with description of a new species. *Zootaxa* **2315,** 51-65) added the following species:
Pegomya ***atricauda*** Ringdahl, 1944 (*Pegomyia*)
Pegomya ***macrophthalma*** Griffiths, 1984

Muscidae. J. SAVAGE and T.A. WHEELER (2004. Phylogeny of the Azeliini (Diptera: Muscidae). *Studia dipterologica* **11**, 259-299) proposed transfer of *Hydrotaea lundbecki* to the genus *Neohydrotaea*:
NEOHYDROTAEA Malloch, 1924
Neohydrotaea lundbecki (Michelsen, 1978 – *Cryptophyra*)

S.S. NIHEI and C.J.B. de CARVALHO (2007. Phylogeny and classification of Muscini (Diptera, Muscidae). *Zoological Journal of the Linnean Society of London* **149**, 493-532) transferred *Morellia simplex* to a new genus, but this is best treated as a subgenus of *Morellia* (Adrian Pont *pers. comm.*):
Subgenus **ZIMINELLIA** Nihei & Carvalho, 2007

Following N.L. EVENHUIS, J.E. O'HARA, T. PAPE and A.C. PONT (2010. Nomenclatural studies toward a world list of Diptera genus-group names. Part I. André-Jean-Baptiste Robineau-Desvoidy. *Zootaxa* **2373**, 1-265) the name *Gymnodia* is accepted as the valid name for *Brontaea* Kowarz, 1873, having been shown not to be preoccupied [reversal of precedence, as set out in Article 23.9 of the International Code of Zoological Nomenclature (1999), cannot be used to preserve the name *Brontaea*, since *Gymnodia* was used as a valid name on many occasions between 1921 and 1986].
GYMNODIA Robineau-Desvoidy, 1863 [= *Brontaea* Kowarz, 1873, synonym]
Gymnodia humilis (Zetterstedt, 1860 – *Aricia*)

Tachinidae
The following species is added in the present issue:
Linnaemya ***picta*** (Meigen, 1824 – *Tachina*)

Rare fungus gnats (Diptera, Mycetophilidae) from a Herefordshire cherry orchard

- The lead author was contracted by the Colwall Orchard Group to carry out survey and assessment of the wood decay invertebrates of a group of traditional orchards at Colwall (SO7642), on the western side of the Malvern Hills, during 2009. In addition to standard hand-searching techniques, two flight interception traps were operated within one particular orchard, which is dominated by mature cherry trees with girths in the range of 1 to 2 metres. Each trap (Fig. 1) comprised four 2 litre plastic drinks bottles, mounted upside-down and screwed into a wooden base, with windows cut in the outer sides to give access to a mixture of antifreeze and soapy water held in the lower section of the bottles. Both traps were placed immediately above large cavities giving access to extensive heartwood decay and accumulations of wood mould. One of the selected cherry trees was deep in the centre of the orchard, the other on the edge. The traps were operated from 10 June and were emptied and the preservative renewed on 5 August and 19 October. The central trap captured 51 species of Diptera including a female of the fungus gnat *Acnemia amoena* Winnertz

(Mycetophilidae) trapped during the first run. The edge trap captured 57 species including a single female of *Grzegorzekia collaris* (Meigen) (Mycetophilidae) during the first run and a female *Mycomya insignis* (Winnertz) (Mycetophilidae) during the second run. No notable Diptera were encountered by hand searching or sweep-netting.

Fig. 1. Flight interception trap used at Colwall cherry orchard.

Acnemia amoena is the rarest of the fungus gnats recorded, having Lower Risk (Near Threatened) status in S.N. Falk and P.J. Chandler (2005. A review of the scarce and threatened flies of Great Britain. Part 2: Nematocera and Aschiza not dealt with by Falk (1991). *Species Status* **2,** 1-189. Joint Nature Conservation Committee, Peterborough.). It has a southern distribution in Britain but has not previously been reported from Herefordshire. It is mainly known from old wood pasture situations and this is the first report from a traditional orchard. *Grzegorzekia collaris* and *Mycomya insignis* both have Lower Risk (Nationally Scarce) status and are regarded as species of broad-leaved woodland, occurring over much of Britain; neither has previously been reported from a traditional orchard or Herefordshire. The ecology of the three gnats is not well-known but they are not suspected to have any association with wood mould in hollow trees; the two latter have web-spinning larvae on damp rotten wood and encrusting fungi, respectively.

One further species taken by the traps also merits a mention - *Mycetophila sigmoides* Loew - as this was added to the British list only very recently (Gibbs, D. 2009 Two Fungus Gnats (Diptera, Mycetophilidae) new to Britain. *Dipterists Digest* (*Second Series*) **16,** 7-13) and Colwall provides an additional county to its known distribution. Two males were taken in the central trap during the second run. This gnat had been overlooked in collections made since 1998. No earlier records have been found so it is almost certainly a recent arrival. It develops in medium tough polypores like *Trametes* and *Daedaleopsis*.

KNAA would like to thank Helen Stace and Tim Dixon of the Colwall Orchard Group for setting up the contract – **K.N.A. ALEXANDER,** 59 Sweetbrier Lane, Heavitree, Exeter EX1 3AQ and **P.J. CHANDLER,** 606B Berryfield Lane, Melksham, Wilts SN12 6EL

Dipterists Digest 2010 **17**, 27-28

A muscid fly (Diptera, Muscidae) with four ocelli

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Summary
Reported here is the curiosity of a muscid fly, *Phaonia tuguriorum* (Scopoli, 1763), with four ocelli. The development of ocelli is outlined, and the possible cause of this aberration is discussed.

A female muscid fly was collected on 24.i.2010 by beating a box bush (*Buxus* sp.) in a garden in Kidlington, Oxfordshire (SP 490136). This fly was identified by the author as *Phaonia tuguriorum* (Scopoli, 1763) (= *P. signata,* Meigen, 1826), using the keys to Muscidae by Assis-Fonseca (1968); this was confirmed by the species description in Gregor *et al.* (2002).

Whilst the fly was being determined it was noticed that this individual had four ocelli. It can be seen in Fig. 1 that the two anterior ocelli are smaller than the posterior ocelli. Normally the anterior median ocellus would be the same size as a posterior ocellus, and it is calculated that the combined area of the two anterior ocelli is the same as that of an individual posterior ocellus.

The occurrence of insects with four ocelli is probably well known to anyone who has examined a large number of specimens. The occurrence in ants (Hymenoptera) is discussed in a review article by Wheeler (1936), and in a grasshopper (Orthoptera) by Glasgow (1925). Normal development of the ocelli is as follows: the three ocelli of the adult are derived from four embryonic rudiments of epidermal origin present in the embryo. Two of these rudiments each form a lateral dorsal (posterior) ocellus, and the other two fuse on the midline to form a single median dorsal (anterior) ocellus (Mobbs 1979). The lateral dorsal ocelli each have a single nerve root, whereas the median ocellus has a double nerve root reflecting its bilateral origin (Imms 1942).

Thus this aberration requires only that the two primordia do not fuse, and that the paired nerve branches retain connections with both ocelli. This is likely to be at a late stage in the development of the median ocellus due to a single developmental gene interaction that has been disrupted. Had the mutated developmental gene, or aberrant gene interaction, occurred earlier in development, involving a gene at the beginning of the regulatory cascade, there could have been an absence, a change in size, or ectopic location of the ocelli (Royet and Finkelstein 1996).

References

d'Assis-Fonseca, E.C.M. 1968. Muscidae. Diptera: Cyclorrhapha. *Handbooks for the Identification of British Insects,* Vol **10** Part 4(b), 119 pp. Royal Entomological Society of London.

Glasgow, R.D. 1925. A specimen of *Melanoplus differentialis* Thomas with four ocelli. *Psyche* **32,** 285–290 (online http://psyche.entclub.org/pdf/32/32-285.pdf).

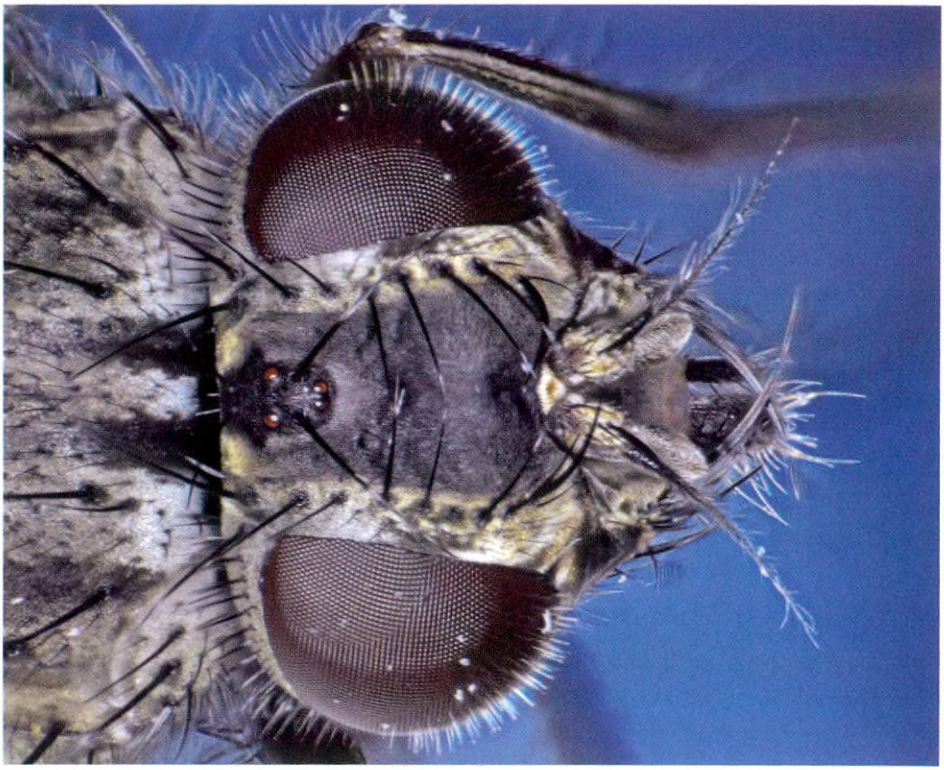


Fig. 1. Head of female *Phaonia tuguriorum* (Scopoli, 1763) with four ocelli, dorsal view.

Gregor, F., Rozkošný, R., Barták, M., and Vaňhara J. 2002. The Muscidae (Diptera) of Central Europe. *Folia Facultatis Scientiarum Naturalium Universitatis Masarykianae Brunensis, Biologia* **107,** 1–280.

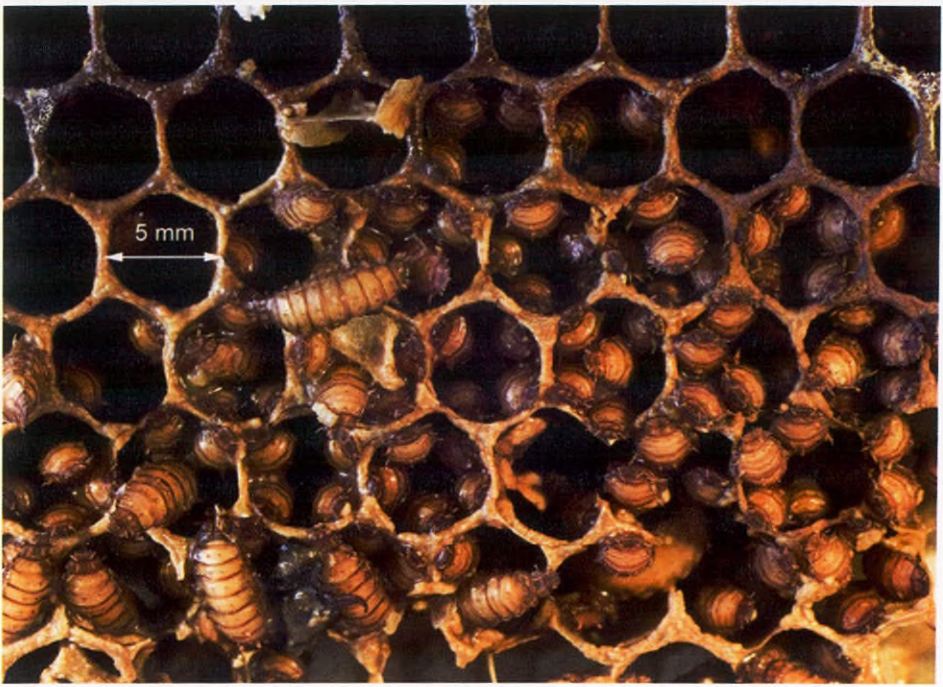
Imms, A.D. 1942. *Outlines of Entomology*. Methuen & Co. Ltd, London (page 36).

Mobbs, P.G. 1979. Development of the dorsal ocelli of the desert locust, *Schistocerca gregaria* Forsk. (Orthoptera : Acrididae). *International Journal of Insect Morphology and Embryology* **8,** 237–255.

Royet, J. and Finkelstein, R. 1996. Hedgehog, wingless and orthodenticle specify adult head development in *Drosophila*. *Development* **122,** 1849–1858 (online http://dev.biologists.org/content/122/6/1849.full.pdf).

Wheeler, W.M. 1936. Binary anterior ocelli in ants. *Biological Bulletin (Woods Hole)* **70,** 185–192 (online http://www.biolbull.org/cgi/reprint/70/2/185.pdf).

***Fannia scalaris* (Fabricius, 1791) (Diptera, Fanniidae), from North Cornwall, the first record in bee hive honeycomb** – Final instar larvae and puparia found in a honeycomb were collected on 23 February 2010 by L. Evans, the hive owner. The comb was from a 5-frame standard nucleus brood hive, kept with other hives in a sheltered paddock (horses present in summer) at Lockengate, near Bodmin, Cornwall (SX032614). The comb was given to R. Loades (Berkshire County Bee Inspector) on 23 February 2010 at Thornes of Windsor (bee suppliers) and then passed to me on 26 February. The comb containing the larvae and puparia (most had pupated by this time) was placed in a sandwich box immediately on receipt. The comb was lightly sprayed with water and the box kept at room temperature (approx. 20°C). Adults began to emerge three days later and the majority had emerged within the next three days. Most were preserved in 70% aqueous ethanol. The number of flies emerging was estimated to be between 200 and 250. The photographs were taken by me on 28 February. The flies were passed to Peter. Chandler, who identified them as *Fannia scalaris* (Fabricius, 1791), a common species in Britain which, although it is generally saprophagous as a larva and has been reared from wasp and bumblebee nests, has not been previously recorded as developing in bee hives (Rozkošný, R., Gregor, F. and Pont, A.C. 1997. The European Fanniidae (Diptera). *Acta Scientarum naturalium Academiae Bohemicae, Brno* **31**(2), 80pp).



The bees in the source hive had not survived the winter; all had died or departed the hive by the end of January 2010, so it is assumed that the hive was free of bees at the time the eggs were laid, although this cannot be verified. The larvae were present in a compact group (see photos) in a small portion of honeycomb measuring approximately 20 cm x 10 cm. The most that can be seen in a single comb cell seems to be seven (as can be seen from by looking carefully at the photographs); although this appears to be quite a squeeze it is possible that this close proximity was as a result of the cold winter conditions and that the walls of cells, and maybe some latent warmth in the hive, offered some degree of protection from the cold.

It is interesting to speculate on the development of this population from egg to adult. A small number were still in the larval state when the comb was received, but within a couple of days all appeared to be puparia. It was not possible to determine how long since the eggs were laid, but assuming that adult(s) would have been ovipositing soon before or not long after the bees' demise, perhaps when there would have still been some warmth in the hive, development of the larva could have been quite long, i.e. several months. However, the impressive speed, i.e. three days, between bringing into warmth and addition of moisture, and the emergence of adults is intriguing and no doubt the result of the necessity of a rapid life cycle for this species under normal conditions - **JON F.H. COLE,** 10 Deerhurst Avenue, Winnersh, Wokingham, Berkshire, RG41 5NL, jon@cole87.freeserve.co.uk

Dipterists Digest 2010 **17**, 31-42

Chalcosyrphus eunotus (Loew, 1873) (Diptera, Syrphidae): its status, distribution, ecology and conservation

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Summary

Chalcosyrphus eunotus was, until recently an under recorded species from an unstudied niche, coarse woody debris. After years of speculation as to the larval habitat for this hoverfly, new field and captive rearing observations confirm the assumption that it develops in coarse woody debris, specifically semi-saturated timber within small woodland streams. Observations by the author also shed more light on the previously unknown mating behaviour, oviposition and territoriality of the species.

Introduction

Chalcosyrphus eunotus (Loew, 1873) (Fig. 1) is a seemingly rare hoverfly associated with a very localised habitat niche (semi-submerged logs in woodland streams). Although a large fly, it is seldom seen and very little is known about its life cycle and habits. It was newly recorded in Staffordshire in 2004 and has since been recorded at a number of sites in three main areas of the county, a key area being Cannock Chase AONB (Area of Outstanding Natural Beauty). This led to the commissioning of an ecological study of *C. eunotus*, of which the purpose was to discover further information about the ecology of the fly and to highlight the importance of coarse woody debris as a resource.

Another key purpose of this study is to add weight and knowledge to the importance of the UKBAP Habitat Action Plan (UKHAP) for Rivers and Streams, and key features that are present within these water systems such as coarse woody debris. There are two type of woody debris, Large Woody Debris (LWD) and the previously mentioned Coarse Woody Debris (CWD). Large Woody Debris tends to be large trees and branches that have fallen into a stream whereas the Coarse Woody Debris refers to the smaller branches, twigs and leaf accumulation. For purposes of *C. eunotus* conservation no separation is made between LWD and CWD as thresholds pertaining to log size used for oviposition are still not known.

Some other hoverflies are also associated with CWD. Three adults of *Chalcosyrphus nemorum* were reared from an in-channel birch log (A. Jukes *pers. obs.* 2008); *C. nemorum* was also observed on the Stafford Brook (6.v.2009) egg-laying on a Large Woody Debris (LWD) dam consisting of birch and willow (*Salix fragilis*). Also, a newly emerged and teneral specimen of *Xylota florum* (Fabricius, 1805) was found by Nick Mott (12.vi.2008) on the underside of a log (tree species not known) at Coombs Valley RSPB reserve, a steep-sided valley woodland with a plentiful supply of in-channel, semi-saturated wood. Godfrey and Middleton (2006) reported that the small hoverflies of the genus *Sphegina* utilised CWD; these occur on woodland streams in Staffordshire, particularly small streams with ample shade and overhanging branches. *Sphegina clunipes* (Fallén, 1816) was observed on several occasions around water mint (*Mentha aquatica*) and appeared to show a preference for this plant over others in and around the streams.

A number of scarce and very scarce species of the cranefly genus *Lipsothrix* (Limoniidae) also have a strong fidelity to CWD, including four UKBAP species (UKBAP 2007). *Lipsothrix nobilis* is perhaps the most important species of this genus (Godfrey 2000,

2003). The UKBAP native white-clawed crayfish (*Austropotamobius pallipes*) is also strongly associated with CWD as well as other in-channel features. Woody debris dams are valuable resources for many other invertebrates but also for vertebrates such as brook lamprey (*Lampetra planeri*) and fish fry.

The present account summarises existing information about *Chalcosyrphus eunotus* and its ecology and provides information to enable site managers and ecologists to safeguard sites and create new habitat.

Taxonomy and recognition of *Chalcosyrphus eunotus* (Loew, 1873)

This is a honeybee (*Apis mellifera*) mimicking hoverfly that in the British fauna, is most similar in appearance to *Brachypalpus laphriformis* (Fallén, 1816), to the point of having in the past been included within the same genus. Hippa (1978) transferred *C. eunotus* from *Brachypalpus* to *Chalcosyrphus*, placing it in the subgenus, *Xylotodes* Shannon, 1926. *Chalcosyrphus*, in Britain, otherwise includes only *C. nemorum* (Fabricius, 1805), a smaller, visually dissimilar species, which is placed in the sub-genus *Xylotina* Hippa, 1978. In Europe there are 12 currently recognised species of *Chalcosyrphus* (Speight 2008) and worldwide there are apparently 103 species (Catalogue of Life: 2009 annual checklist). On the near continent the most similar species is C. *jacobsoni* (Stackelberg, 1921), which is shorter-haired on the body and scutellum. These species were keyed by Speight and Sarthou (2008).

Fig. 1. *Chalcosyrphus eunotus* (Loew, 1873)

Generally, the adult fly has a dark brown body with golden brown to brown hairs and grey dust spots on its abdomen; the face is slivery white haired, a good visual cue in field observation of the species resting on in-channel logs. Males are approximately 10mm in body length, with wing length about 9mm giving a total wingspan of the fly of ±21mm. *Brachypalpus laphriformis* males are very similar, but *C. eunotus* males have a pair of faint,

large, greyish semi-rectangular bars on tergite 2 (second abdominal segment) and the hind femur is strongly arched in *B. laphriformis*. The abdomen is also slightly shorter than that of *B. laphriformis*. The top of the thorax (dorsum) is faintly striped and dull in appearance whereas in *B. laphriformis* it is less striped but shining. The wings are similar to *B. laphriformis* except for a slightly stronger clouded mark at approximately half way along the wing (Stubbs and Falk 2002). Females are very similar to males but are broader with rectangular grey spots on tergites 2 and 3 (Stubbs and Falk 2002). The female of *C. eunotus* has a wing length of ±9.5-10.5mm (Stubbs and Falk). Some female *Chalcosyrphus* have a slight orange hue towards the base of the wing fading out completely after approximately a quarter of the wing length or up to the wing cloud. This character is, however, not consistent in all specimens but when it does occur is stronger than that of *Brachypalpus*.

The egg is broadly cylindrical with rounded ends, circa 2mm long by ± 0.6mm wide, with a milky white complexion that appears to turn brown after a few days.

Chalcosyrphus larvae have a short tail (bearing the spiracles for breathing) and are slightly dorsoventrally flattened with two sets of 1-2 black hooks on the thorax. The larva was described in detail by Maibach and Goeldlin de Tiefenau (1992) and Rotheray (1993). The mature *C. eunotus* larva is ±22mm long (in the preserved, extended state) and 4.5mm at its widest point. Live larvae are a creamy yellow colour, turning duller in a preserved state. Rotheray (1993) suggested that the dorsoventrally flattened body type is probably for life under bark and within accumulations of decaying sap, but the larval ecology has remained poorly understood (Godfrey and Middleton (2006).

The status of *Chalcosyrphus eunotus*

In Europe, *C. eunotus* is found from Britain in the west to Spain in the south and across to Poland and Romania in the east. The inclusion of the "Near East" in the distribution given in Fauna Europaea (Speight 2004) is due to it being recorded from Armenia in the Palaearctic Catalogue (Peck 1988). Speight and Castella (2001) suggested that it is declining across much of its range with noticeable decreases in population numbers, although the recent findings in Britain and in the Netherlands (Renema 2001) suggest that it may be significantly under-recorded because of its habitat requirements being unfamiliar to collectors.

Chalcosyrphus eunotus was first recorded in Britain in 1899 from a single record in woodland at Ledbury, Herefordshire. Cyril O. Hammond then recorded it at Cothill Fen, Oxfordshire in 1953, where it was flying "back and forth" over a shaded pool (Stubbs and Falk 2002). Alan Stubbs (*pers. comm.*) recorded a specimen in 1977 at the Wyre Forest, Worcestershire, sitting on a log in a shaded stream. It was his observation that highlighted this habitat as an area to search for this elusive species. Since then a number of records have come forward. In recent years, due to a combination of the recognition of small woodland streams as a valuable habitat and greater recording effort through promotion of hoverflies as a recording group the number of records submitted to the Hoverfly Recording Scheme for this species now exceeds 30 sites. The known distribution is nevertheless still very much biased towards the western parts of England, with a concentration in the Welsh borders. It is not known from the east, south-east or north of England, or from Scotland.

Falk (1991) assigned the status of RDB (Red Data Book) 2 (Vulnerable) to *C. eunotus*, when it was known only from six sites in Britain, four of them post 1960. Recent Reviews of Scarce Diptera have adopted IUCN statuses based on different criteria and in the draft review of British hoverflies by Ball and Morris (in press: available as a download from the Dipterists Forum website) *C. eunotus* is assigned the status of 'Lower Risk (Nationally Scarce)'. This category corresponds to the Notable category used by Falk (*op. cit.*) as it includes species

known from between 15 and 100 10km squares (hectads) and this designation of *C. eunotus* is based on the recent increase in knowledge of its distribution (27 post 1980 hectads).

There is a predominance of records from the Watsonian Vice-Counties of Shropshire, Staffordshire and more historically, Worcestershire. There are some recent records from The Wirral (V.C. 51, 2003) and Wales (V.C. 49, 2005) (Hoverfly Recording Scheme 2009) but the current stronghold appears to be Shropshire and Staffordshire. Some records result from the activities of local entomologists, but some are due to commissioned surveys looking for another coarse woody debris species *Lipsothrix nobilis* Loew, 1873 (formerly *L. nigristigma* Edwards, 1938), carried out by Andy Godfrey between 2000 and 2006 (Godfrey 2000, 2003).

An ecological study of *Chalcosyrphus eunotus* in Staffordshire

The status of *C. eunotus* and its habitat in Staffordshire

Chalcosyrphus eunotus is a recent addition to Staffordshire's Diptera fauna, first recorded by Nick Mott and Andy Godfrey in 2004 from Cotton Dell, a Staffordshire Wildlife Trust reserve in the north-east of the county. This site is a steep-sided upland valley oak *Quercus* woodland with a small, fast-flowing riffle and pool stream. This first county record was incidental to searching for the RDB1 (Endangered) cranefly *Lipsothrix nobilis* Loew, 1873. Since then a number of records have been gathered from various parts of the county during surveys undertaken for Staffordshire Wildlife Trust by the author and Nick Mott, and by AJ as an independent consultant. The majority of these records originated from the Cannock Chase AONB (Area of Outstanding Natural Beauty), where a substantial population was discovered during a series of invertebrate surveys looking at the stream habitat quality of the AONB. Also, in 2008-2009 there were clusters of records from the Churnet Valley SSSI in north-east Staffordshire and similarly from mid-Staffordshire. All these areas are either continuous woodland or with several small woodland "dingles" in proximity. The streams within these areas do not characteristically flood or are within floodplain environs that over-top during storm surges or in winter. As highlighted by Renema (2001), who studied the species in the Netherlands, *C. eunotus* appears to be under-recorded and once initially detected more records follow from the surrounding area. Work in Staffordshire supports this.

The majority of the present study has been undertaken on two streams within the Cannock Chase AONB:

(a) **The Stafford Brook** (SK022192), a tree-lined stream (not woodland) on the south-eastern side of Cannock Chase. The total canopy cover, comprising alder (*Alnus glutinosa*) and silver birch (*Betula pendula*), is approximately 90% with intermittent sunlight penetrating through the trees with relative ease. The stream itself is shallow riffle and pool, with gravel substrate and silted pools. Log jams, backing up water to form pools (akin to a dam), are infrequent but woody debris is occasional to frequent throughout the course of the stream and is often lodged in shallow water on gravel bars, ranging in diameter from a few to several centimetres and in length from 30cm to 200-300cm.

(b) **The Old Brook** (SK005199), a wooded stream valley approximately 1.3km due west of the Stafford Brook, with approximately 80% canopy dominated by alder. At its northern end are numerous seepage lines and boggy, silted margins with small tributaries running through these muddy margins creating a braided stream channel. Upstream, the canopy changes to conifer and 100% dense cover and then opens to extensive sunlit areas where tree felling of broad-leaved and coniferous trees has taken place over successive years. The stream at this upstream point is narrow (<1m wide) with a very open canopy and no log jams but it does have frequent large (>20cm wide) logs deposited into it.

Larval development

Observations made in 2009 suggest that the larvae hatch between 2-4 weeks after egg laying, when they presumably make their way into the host material. They may lie under the surface of the bark and feed on accumulations of decaying sap when young as suggested by Rotheray (1993); however, larvae that I found were not under bark but in excavated channels within the wood. Larvae extracted on 27.x.2009 were all from the near-centre of the log. The material from which 6 out of 7 larvae were extracted was moderately saturated white, fibrous wood (Fig. 2). One larva was under approximately 5mm of wood fibres near the end of the log, which was more decayed with greater saturation. Large amounts of wet frass were found in this area, suggesting a high level of activity in this location in the past by larvae.

Fig. 2. Aggregation of larvae of *Chalcosyrphus eunotus* in a piece of birch (*Betula*) wood.

As the larvae prefer a moderate saturation of wood (not complete saturation or total immersion in water) then the local relative humidity is a highly probable factor in determining the success of larval development and survival. Logs that have retained a bark covering are probably important for oviposition as these retain moisture more efficiently than wood stripped of its outer layers. The short tail bearing the spiracles reinforces the theory that they do not live in totally saturated or immersed wood, as they would not be able to breath under such, submerged conditions.

Logs that are not totally submerged but have at least a third of the circumference exposed above the water line are, therefore, considered likely to be suitable. It may therefore be possible to find larvae by feeling a log's surface, particularly from late summer onwards when the larvae are larger and evidence is therefore easier to locate. Where the log gives slightly if pressed this indicates a sub-surface, excavated channel and will be a good place to excavate to search for larvae. This will obviously only work with thin barked species such as birch, or logs from young trees that do not have a thick or well developed periderm (outer bark).

From investigations and observations undertaken, *Chalcosyrphus* larvae (both *C. eunotus* and *C. nemorum*) would appear to prefer the upper sides and top of saturated and semi-saturated logs. No syrphid larvae have been found below the water line.

Adult behaviour

Chalcosyrphus eunotus is on the wing from April to June, with the majority of records in May. The earliest record is 16 April and latest 29 June (NBN Gateway 2009), although Stubbs and Falk (2002) listed the flight period extending to July. It can be found along small to very small woodland streams with semi-submerged wood in the stream, most often observed on sunlit vegetation or in-channel logs. It is interesting that no feeding by adults has been observed, nor have any observations been found in the literature. One habit that was observed is that the flies have a tendency to fly straight up into the canopy. This could be a defensive "flight response" to predators or more likely the flies are feeding in the canopy on tree flowers or aphid honeydew.

Stubbs and Falk (2002) stated that the males hold small territories, presumably referring to the habit of sitting in prominent situations along a stream such as on logs, sunlit vegetation and any other in-channel features. Old drinks cans and tyres have been observed as being just as suitable as more natural perches for the males. These objects, elevated above the water line, serve as a vantage point from which a male can see passing females or other males. A male "returning" to the territory perch after seeing off another male or investigating a passing female was always thought to be the same individual, but new studies have not supported that view. Through a mark, release and recapture exercise (MRR) the author discovered that males do not have exclusivity to perch sites. A male would appear to only hold the territory space for a short period of time and then to move on to another location along the stream course, either of its own volition or when it is displaced by another *C. eunotus* male. During a 2 week MRR experiment, only one male from several (on each day) that were tagged was recaptured at the same location as it was first captured (see Fig. 3 for tagged fly), when it returned after a 3 hour absence.

Although only a very small sample of flies were marked in this work it can be suggested, as flies disappear for long periods from mark and release sites, that this may indicate high mobility of males and that they may move between streams during the course of a day. It may not be a coincidence that where one fly has been recorded numerous records can be obtained from other streams in the vicinity (Renema 2001). Woody debris, even along a high quality stream with intact features, may not all be at the right stage of saturation, aspect, humidity or other factor to suit oviposition. Along the Stafford Brook for example, there is not a huge resource of suitably saturated wood to sustain a large population of flies. Therefore the flies may be moving from one stream to another for oviposition or to find a mate.

Fig. 3. A tagged *Chalcosyrphus eunotus* (Loew, 1873).

Mating

Mating was observed on many occasions along the Stafford Brook, for the first time on 29.iv.2009. The initiation of each mating varied slightly but a few observations appear to be consistent. All matings observed were initiated by a male from a vantage point (log, etc.). The female either actively focuses in to investigate the log on which the male is perched or is passively flying past along the stream. If this is close enough (observations indicate to a distance of less than 50cm) the male will launch into the female and grapple with her in flight. If the coupling is successful the pair fly off with one fly carrying the other. The coupled flies normally leave the stream and head towards bankside scrub or other vegetation (witnessed up to 10 metres away). The mating is no more than 10-15 seconds in duration, after which it is normally the male that flies off leaving the female to sunbathe on the vegetation for a few minutes.

Oviposition

Oviposition on wood of birch (*Betula* species) and alder (*Alnus glutinosa*) has been observed; oak (*Quercus* species) and beech (*Fraxinus excelsior*) are also considered likely, but other species have yet to be confirmed. Two females were observed egg-laying on 12.v.2009 along the Stafford Brook, in both instances onto an in-channel semi-saturated birch log, 50mm diameter by 750mm long located at the side of the brook. Investigation of suitable egg-laying sites by females was also observed on the Old Brook, where a female was observed investigating alder (*Alnus glutinosa*) from the main stream channel and also along braided tributary channels derived primarily from seepages. During all these instances the females were conspicuous and were easily approached. Their preoccupation in finding suitable sites

seems to be overwhelming, to the exclusion of even primary predator awareness and flight responses. Females are very active during this behaviour and rapidly move from one part of a log to another or from one log to another and back again. Suitable positions for investigation include lifted bark, broken ends of the log, cracks in the bark or the thin rolls of outer "paper" bark of birch. Possible factors that may raise an oviposition site's potential could include its optimal saturation, state of sap decay and accumulation, temperature, aspect and position, entrenchment into sediment and also the species of wood. Size of wood material may not be of paramount importance, rather the state of saturation of the material, though this will tend towards smaller diameter material that is more readily available at the higher saturation levels within a small woodland stream. Suitable oviposition sites probably exclude those logs that do not have a bark covering as these are more prone to desiccation, even those that are semi-submerged as the exposed portion can exhibit some drying during the summer months.

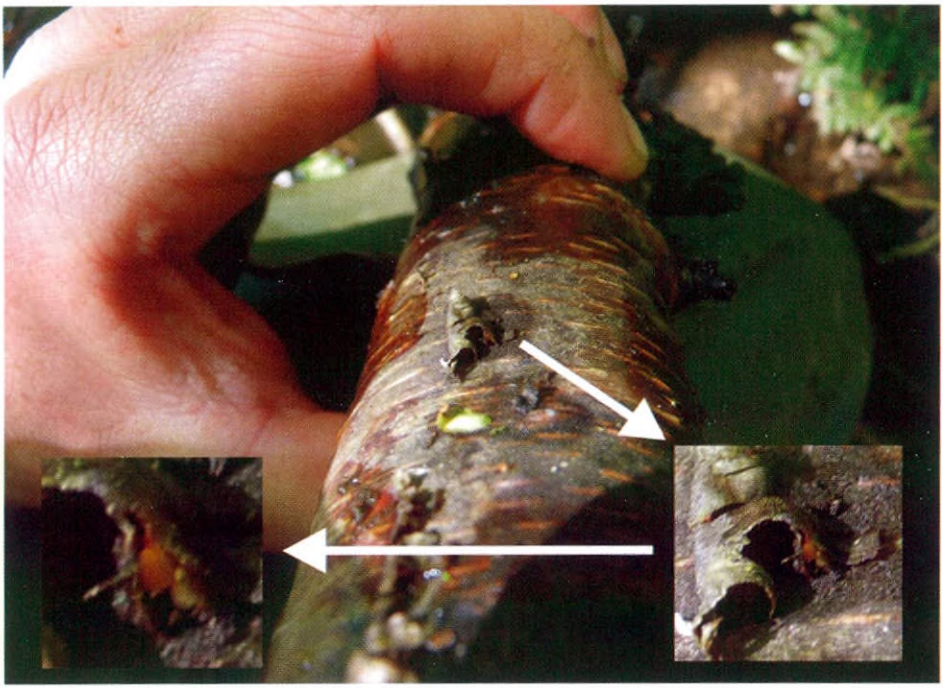

Fig. 4. Oviposition location of *Chalcosyrphus eunotus*.

If a log appears suitable the female initiates a "bobbing" action, touching the tip of the abdomen on the surface twice or more per second. This may then be followed by the extension of the ovipositor, which is re-curved forward underneath the abdomen and thorax of the fly and is probed into suitable crevices and cracks in the wood, in which eggs appear to be laid in small batches, pairs or singly. Fig. 4 shows eggs laid within a thin roll of paper bark on a birch log. There are clearly 2 or perhaps 3 eggs within this roll. One egg is white and the other 1-2 appear to be yellow in colour. It could be speculated, and is highly likely, that

the two darker eggs had been laid on a previous visit by this or by another female. If this is the case, then females would appear to seek to exploit optimal locations to provide the greatest opportunities for their genetic line regardless of previous oviposition by other females.

The need for further research

More work is required to understand how the adult flies interact with their habitat, whether they move between streams, and to determine if a network of wooded streams is necessary for a viable population. Further work on oviposition is required, including whether it will oviposit in saturated wood away from a stream course as with other species of this genus including *C. nemorum*. Further work is necessary to increase understanding of larval biology and the later stages of development to the puparial stage. Adult foraging has also yet to be observed.

Conservation of *Chalcosyrphus eunotus*

Habitat requirements

Chalcosyrphus eunotus is a species of deciduously wooded streams that contain woody debris; these may be small to very small streams, more often riffle and pool types, either in woodland or tree-lined. It is more likely to be found in areas with a number of connected or near connected wooded streams, rather than isolated sites. The females require in-channel logs that are semi-saturated and semi-submerged in which to lay their eggs. Small logs may be used more often as these will become saturated more quickly than larger ones. Length of log may not be a critical factor but a continual supply of logs annually is necessary to replenish the resource. Streams with other in-channel features and bankside vegetation on which flies can perch and bask are important. Where a loose canopy enables dappled light to create localised sun patches on bankside vegetation and in-channel logs these are the best places to search for adult flies. Fulfilling these criteria will maintain and enhance sites for *C. eunotus*.

Reasons for a potential decline: removal of woody debris

Woody debris has historically been removed from watercourses (both large and small) to improve water flow, which may have resulted in a decline although the increased level of recording in recent years cannot demonstrate that to be the case. Although often undertaken with well-meaning intention, it has had detrimental impacts to woodland stream fauna, including the other species referred to above. Debris in streams has only recently been highlighted as a valuable resource for invertebrates and fish fry. Mott (2005) and Godfrey and Middleton (2007) stressed the importance of LWD and CWD, particularly in terms of scarce and threatened species. The practice of woody debris removal is still, however, undertaken and it is only a minority of streams and sites that retain a continuous resource.

Metapopulations

In view of the mobility of males suggested above, a network of linked sites may be important to this species, explaining why there are often groups of records from nearby localities within a wooded area. Records from Worcestershire, Staffordshire and Shropshire are from well-wooded districts or areas with linked or narrowly separated dingle woodlands and not usually from isolated sites. Any known isolated sites with extant populations are highly likely to have once been part of a larger complex of woodlands and such populations are unlikely to persist

where the resource of semi-saturated wood is not replenished on a regular basis. Fragmentation and isolation of small woodland streams may thus have a detrimental impact on *C. eunotus*. More investigation is required to substantiate this.

Conserving *Chalcosyrphus eunotus*

For information on known sites, the Hoverfly Recording Scheme (www.hoverfly.org.uk), local Biological Records Centres and Wildlife Trusts can be consulted. It is also a much overlooked species and is highly likely to be present in other areas of southern Britain, particularly in the west. Sites that appear suitable can be enhanced through increasing the input of woody debris, either by leaving it in channel after natural windfall or by selectively felling or pollarding stream-side trees. Much of this material will drift downstream until it collects to form a woody debris dam. Such large accumulations of material are often where flies congregate. If habitat is newly created it may take a few years for a site to become suitable for *C. eunotus* but in the interim many other species will use the added resource. Management or in some cases the intentional lack of it over a number of adjacent woodland streams will add to the value and should be encouraged wherever possible.

Conclusions

Chalcosyrphus eunotus has a highly specialised lifestyle. As more is discovered about its habits and behaviour then more can be done to protect the species. There are a number of key areas for the fly in the western part of England, mainly Staffordshire and Shropshire, and to a lesser extent Worcestershire. It is highly likely that other strongholds in other wooded areas of southern Britain have yet to be recorded, particularly in the Welsh valley woodlands. The main focus for managers or ecologists who wish to raise the profile of this species or of coarse woody debris as a habitat is to emphasise it as part of the Rivers and Streams HAP that should be used to initiate changes in management, coupled with any other UKBAP species such as white-clawed crayfish that are applicable locally. The increased awareness of coarse woody debris as a valuable woodland stream resource for wildlife will help the fly and others that depend upon this niche environment. However, it is still a low status conservation objective for woodland/waterway management that requires redressing. As with deadwood in parklands, the process of deeper knowledge and wider awareness will take time, but through high profile species such as *C. eunotus* and *Lipsothrix nobilis*, the resource should eventually receive wider attention and due recognition.

Acknowledgements

The author would like to thank Nick Mott of Staffordshire Wildlife Trust for assisting with this work and commenting on drafts. Martin Speight also commented on a draft and provided valuable information to further the studies of this fly. Nigel Jones also provided some interesting and corroborating site information regarding *C. eunotus* in Shropshire.

Further reading and references

Godfrey and Middleton (2006) collated much information about the species that utilise coarse woody debris as a habitat. A leaflet by Staffordshire Wildlife Trust (Mott 2005) seeks to raise visual awareness of the importance of woody debris to a functioning watercourse system and the species that live amongst it. The series of surveys of woodland stream quality on Cannock Chase (Jukes and Mott 2007-2008 and Jukes 2009), using invertebrates in their assessment,

can be obtained through the Staffordshire Wildlife Trust (contact Nick Mott at the Staffordshire Wildlife Trust for details).

Ball, S.G. & Morris, R.K.A. (in press). A review of the scarce and threatened flies of Great Britain. Part x: Hoverflies, family Syrphidae. *Species Status* **x**: xx pp. Joint Nature Conservation Committee, Peterborough.

Falk, S. 1991. A review of the scarce and threatened flies of Great Britain. (part 1). *Research and survey in nature conservation* **39,** 1-194.

Godfrey, A. 2000. *Survey for the cranefly Lipsothrix nigristigma.* English Nature Research Reports No. 351 and No. 410. English Nature.

Godfrey, A. 2003. *A review of the invertebrate interest of coarse woody debris in England.* English Nature Research Reports, No 513. English Nature.

Godfrey, A. and Middleton I. 2006. Invertebrates associated with coarse woody debris in streams and rivers in Britain. *British Wildlife* **18**, 178-83.

Hippa, H. 1978. Classification of the genera *Xylota* Meigen and *Xylotomima* Shannon (Diptera, Syrphidae). *Annales zoologicae Fennicae* **156,** 1-153

Hoverfly Recording Scheme. www.hoverfly.org.uk (accessed October, 2009).

Jukes, A. and Mott, M 2007. *AONB streams project, year 1.* Unpublished report for Cannock Chase AONB Unit.

Jukes, A. and Mott, M. 2008. *AONB streams project, year 2.* Unpublished report for Cannock Chase AONB Unit.

Jukes, A. 2009. *AONB streams project, year 3.* Unpublished report for Cannock Chase AONB Unit.

Maibach, A. and Goeldlin de Tiefenau, P. 1992. Description de la pupe de *Chalcosyrphus (Xylotodes) eunotus* (Loew) et synthèse caractéristiques morphologiques des stades immatures de plusieurs genres de la tribe des Xylotini (Diptera, Syrphidae). *Mitteilungen der Schweizerischen Entomologischen Gesellschaft* **65,** 165-175.

Mott, N. 2005. *Managing Woody Debris in Rivers and Streams.* Staffordshire Wildlife Trust. George Street Press.

Peck, L.V. 1988. Family Syrphidae. **In** Soós, Á. and Papp, L. (Eds) *Catalogue of Palaearctic Diptera* **8,** 11-230.

Renema, W. 2001. Driemaal is scheepsrecht, de zweefvlieg *Chalcosyrphus eunotus* terug op de Nederlandse lijst (Diptera: Syrphidae). *Nederlandse Faunistiche Mededelingen* **15,** 111-115.

Rotheray, G.E. 1993. Colour guide to hoverfly larvae (Diptera, Syrphidae). *Dipterists Digest (First Series)* **9,** 1-155.

Speight, M.C.D. and Castella, E. 2001. Range and Status Data for European Syrphidae (Diptera) **In** Speight, M C .D., Castella, E., Ordlik, P. and Ball, S. (Eds) Syrph the Net, the database of European Syrphidae, Vol. 30, Syrph the Net publication, Dublin, pp 215.

Speight, M.C.D. 2004. Fauna Europaea: Syrphidae. **In** Pape, T. (Ed.). 2004. *Fauna Europaea: Diptera: Brachycera. Fauna Europaea* version 1.3, *http://www.faunaeur.org.*

Speight, M.C.D. 2008. Species accounts of European Syrphidae (Diptera). **In** Speight, M.C.D., Castella, E., Sarthou, J.-P. and Monteil, C. (Eds.) *Syrph the Net, the database of European Syrphidae*, vol. **55,** 262 pp. Syrph the Net publications, Dublin.

Speight, M.C.D. and. Sarthou, J.-P. 2008. StN keys for the identification of adult European Syrphidae. **In** Speight, M.C.D., Castella, E., Sarthou, J.-P. and Monteil, C. (Eds) *Syrph the Net, the database of European Syrphidae*, vol. **55,** 262 pp. Syrph the Net publications, Dublin

Stubbs, A.E. and Falk, S. 2002. *British hoverflies, an illustrated identification guide*. Second edition. British Entomological and Natural History Society, Reading.

An exceptional density of *Agathomyia wankowiczii* (Schnabl) (Diptera, Platypezidae) galls - The artist's bracket (*Ganoderma applanatum*) pictured here was found on the ground in beech woodland on Naphill Common, Buckinghamshire (SU840973) on 24 January 2010.

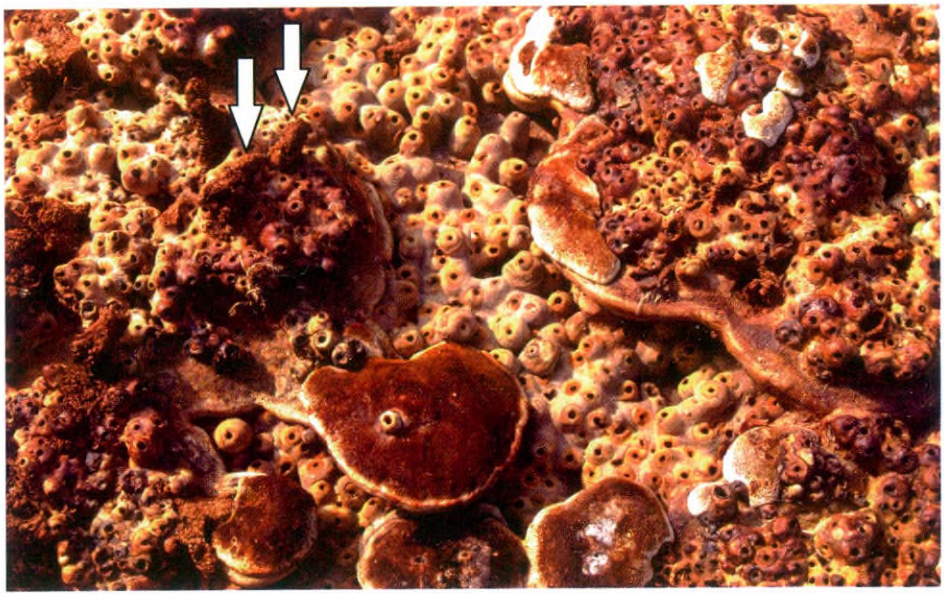

Fig. 1. Underside of bracket of *Ganoderma applanatum* with galls of *Agathomyia wankowiczii* (Schnabl)

The bracket, measuring 43 cm along its greatest axis, was estimated to contain at least 2,500 *A. wankowiczii* galls, covering approximately 90% of the bracket's lower surface. Some of these supported what appeared to be exit tubes constructed from fragments of the bracket material held together with silk (indicated by arrows in the photograph) - **JOHN TYLER,** 5 Woodfield, Lacey Green, Bucks HP27 0QQ

Head-down behaviour in *Physocephala rufipes* (Fabricius, 1781) (Diptera, Conopidae) - In October 2006 I photographed this common fly in my garden in south-east London, as it rested on a leaf. It remained stationary for several minutes, enough for me to assemble camera, lens and flash paraphernalia and to take several pictures. This is a distinctive and handsome fly, and I was pleased enough with the photographs, but thought nothing more until I recently came across them again.

Fig. 1. *Physocephala rufipes* (Fabricius, 1781), male.

Looking now, I see that the fly has adopted a singular head-down tail-up pose. This is particularly striking in side view (Fig. 1). A quick search of internet images shows that the fly frequently rests with its tail stuck up in the air, but that this is less obvious when it is resting on a flower. I cannot find any reference to conopid sitting positions, so I cannot help wondering why this fly should adopt such an odd stance. The fly is not extending proboscis or antennae to the leaf, but seems to be pressing its forehead down. It is almost as if it is trying to hide its head, and instead is deliberately presenting its abdomen up at the world.

In an interesting paper on butterfly false heads, C. Cordero (2001. A different look at the false head of butterflies. *Ecological Entomology* **26,** 106-108) makes an intriguing suggestion about butterflies hiding their heads. His idea was that rather than false eye-spots (and sometimes also false antennae and false leg markings) at the wing tips deflecting bird attack to this relatively expendable bit of scaly membrane, it made a would-be predator try to attack the less obvious, but real head at the head end. In trying to gain the advantage of a sneak attack at what it thinks is the blind-spot of the insect's rear end, it is, in reality, making

a full-blown approach on the real head, with its watchful real eyes. The butterfly is more likely to escape because it more easily sees its enemy coming, and can calculate an evasive manoeuvre.

With its head hidden down, and its prominent bulbous abdomen resembling a head on a neck, it is tempting to suggest that *Physocephala* is also benefiting from some similar form of predator confusion. Unless anyone else can suggest why this fly should sit with its backside stuck up in the air? - **RICHARD A. JONES,** 135 Friern Road, East Dulwich, London SE22 0AZ, bugmanjones@hotmail.com

A belated record of *Acinia corniculata* (Zetterstedt, 1819) (Diptera, Tephritidae) from West Sussex - On 30 July 2003 I swept a single specimen of this rare fly from a flowery grazing meadow near Ifield, Crawley, in West Sussex (TQ246370, V.C. 13). Although this species is accorded 'Endangered' status (Red Data Book category 1), by D.A. Shirt (1987. *British red data books: 2. Insects*) and S.J. Falk (1991. *A review of the scarce and threatened flies of Great Britain — Part 1*), it appears to have been slightly more regularly recorded in the last decade and there is a scattering of records around Hampshire, Surrey, Kent and East Sussex (Clemons, L. 2008. Updated distribution maps of the Tephritidae (Diptera) of Britain and Ireland, downloaded from: http://www.dipteristsforum.org.uk/documents/TEPHRITIDAE_MAPS_SEP08.pdf).

Other flies found on the same occasion included: *Stratiomys potamida* (Meigen, 1822) (Stratiomyidae); *Anasimyia lineata* (Fabricius, 1787), *Chrysotoxum verralli* Collin 1940, *Platycheirus rosarum* (Fabricius, 1787), *Volucella inanis* (Linnaeus, 1758) (Syrphidae); *Phasia hemiptera* (Fabricius, 1794) (Tachinidae); *Sphenella marginata* (Fallén, 1814), *Tephritis cometa* Loew, 1840 and *Urophora quadrifasciata* (Meigen, 1826) (Tephritidae) - **RICHARD A. JONES,** 135 Friern Road, East Dulwich, London SE22 0AZ, bugmanjones@hotmail.com

Another record of *Chrysopilus laetus* Zetterstedt, 1842 (Diptera, Rhagionidae) in south-east London - Shortly after my previous note on this formerly rare fly went to press (Jones, R.A. 2009. *Chrysopilus laetus* Zetterstedt, 1842 (Diptera, Rhagionidae), in south-east London, *Dipterists Digest* (*Second Series*) **16,** 79), I found another example. On 23 June 2009, whilst enjoying the sunshine at my allotment near Dulwich Woods (TQ341725), a female landed on my hand and was promptly captured. This site is just over 1 km from the previous locality and suggests that it is well established in the area - **RICHARD A. JONES**, 135 Friern Road, East Dulwich, London SE22 0AZ, bugmanjones@hotmail.com

NOTICE - I am currently researching mosquitoes and biting midges and need information, not about their biology, but their cultural associations. In effect mosquitoes mentioned in works of fiction, poetry, art (paintings, sculpture, ceramics, etc), film, television, songs, music...in fact anywhere outside the normal scientific sphere. Any suggestions gratefully received. Thank you - **RICHARD A. JONES**, 135 Friern Road, East Dulwich, London SE22 0AZ, bugmanjones@hotmail.com, 07973 829953.

The rearing of *Thyridanthrax fenestratus* (Fallén, 1814) (Diptera, Bombyliidae) from a cocoon of *Ammophila pubescens* (Curtis, 1836) (Hymenoptera, Sphecidae) - Pontin (1961. *Thyridanthrax fenestratus* Fall. (Dipt., Bombyliidae) parasitic on *Ammophila* (Hym., Sphecidae). *Entomologist's monthly Magazine* **97,** 26) reared an adult *Thyridanthrax fenestratus* (Fallén, 1814) from the cocoon of an unidentified species of *Ammophila*, and *T. fenestratus* is often seen egg-flicking at or near the entrance to *Ammophila pubescens* (Curtis, 1836) burrows, but a definite link between the two species was lacking. On 12 August 2000 we marked the positions of *Ammophila pubescens* burrows at three sites on Thursley Common NNR in Surrey so that they could be dug up the following spring and examined for the presence of *Thyridanthrax fenestratus*. At the first site *T. fenestratus* was seen flicking eggs towards the entrance to a single burrow but the excavator of the burrow, presumed to be *A. pubescens*, was not seen. At the second site there were three burrows with *A. pubescens* present on 11 August, together with a single *T. fenestratus* sitting nearby. At the third site there was a burrow with *A. pubescens* present but *T. fenestratus* was not seen. The sites of the burrows were marked using two solid brass posts knocked into the ground so as to be invisible from the surface. The two posts were each 295mm from the burrow entrance, with one to the south and one to the west of the entrance. Two imaginary lines drawn from the posts to the burrow entrance formed an angle of 90° where they met. Strands of wool attached to nearby bushes marked the approximate position of the burrows.

The three sites were revisited on 12 April 2001 and the position of the burrows identified initially by the wool markers and then by using a metal detector (*Garrett Treasure Ace 300*) to find the sunken brass posts. (As the sites were on land that had been an Army Training Area the use of solid brass posts enabled the metal detector to be calibrated to avoid confusion from detecting spent munitions). Once a pair of posts was located, imaginary lines drawn from each, and subtending a 90° angle at their intersection, identified the position of the burrow. When the position of the burrow was identified the surrounding soil was carefully excavated until a cocoon was found. Two cocoons were found at the first site, one was 60mm below the surface the other was 10mm below the surface. Two cocoons were also found at the second site, one 20mm and the other 30mm below the surface. At the third site a single cocoon was found 20mm below the surface. At the first site the number of cocoons was greater than the number of burrows observed. However, *A. pubescens* burrows are often close together and are difficult to see after the entrances have been closed by the wasp.

All the cocoons recovered were identical in appearance. The cocoons were removed and placed, together with soil, in separate glass jars, which were kept in an unheated outbuilding. A fly pupa with a crown of seven spines at its top (see Fig. 1) broke its way out of one of the cocoons from the second site and pushed its way up to the soil surface. An adult *T. fenestratus* emerged from this pupa on 1 July 2001. It can be seen that the fly pupa has come up through the middle of the interior of the cocoon. In order to produce this cocoon the larva of the host wasp must have successfully completed its growth having fed on the food supplies provided by the parent wasp. On the assumption that *T. fenestratus* is, like other bombyliids, an ectoparasitoid then it might be assumed that whilst the cocoon was being produced the fly larva was in close association with the wasp larva in order for it to end up within the cocoon and consume its host. However, there is a hole at the bottom of the cocoon as well as its top. Therefore, it is possible that the fly larva, having eaten some of its host's provisions, bored its way into the cocoon from below after the cocoon was formed above it.

Once within the cocoon it consumed the wasp pre-pupa or pupa. An adult *A. pubescens* emerged from one of the cocoons from the first site on 2 July 2001. There was no hole at the bottom of this cocoon. Nothing emerged from the three remaining cocoons.

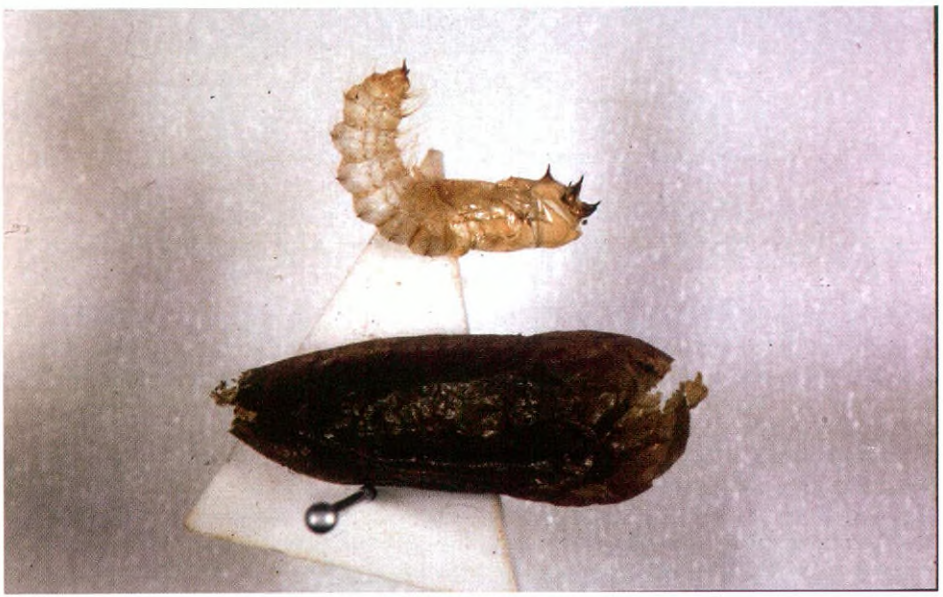

Fig. 1. Cocoon of *Ammophila pubescens* (Curtis) (below) and pupa of *Thyridanthrax fenestratus* (Fallén) (below).

From this work we have a definite proof that the mottled bee-fly (*Thyridanthrax fenestratus*) is a parasitoid of the sphecid wasp *A. pubescens*. At this stage we cannot tell whether the fly larva consumed any of the prey provided by the parent wasp for its own larva. We can assume that once inside the cocoon the fly larva consumed its host before pupating within its host's cocoon.

We should like to thank English Nature (now reorganised as Natural England) for permission to carry out this work on Thursley Common NNR and English Nature and the British Entomological and Natural History Society for funding – **STEPHEN MILES,** Sandown, Drift Road, Whitehill, Bordon, GU35 9DZ and **JOHN MUGGLETON,** 17 Chantry Road, Wilton, Salisbury, SP2 0LT

Dipterists Digest 2010 **17**, 47-49

Thereva handlirschi Kröber, 1912 (Diptera, Therevidae) and other notable Diptera in N Scotland

MURDO MACDONALD
'Tigh nam Beithe', Strathpeffer, Ross & Cromarty.

Summary
Observations of *Thereva handlirschi* Kröber, 1912 from northern Scotland are documented. It is probably widespread and not uncommon, but overlooked because of its late flight period. The author always found it basking in warm dry habitats near to trees. Records of other scarce Diptera (Lower Brachycera and Tachinidae) are included where these extend the known range or where Scottish records are few.

Introduction

The golden Scottish stiletto fly *Thereva handlirschi* Kröber, 1912 (Therevidae) was regarded until recently as a rare and little-known species (Stubbs and Drake 2001). It was always thought to have been restricted to Strathspey, Deeside and Moray in N Scotland, and the dataset 'Brachycera (Diptera) records from Britain and Ireland to 1990' (BRBI) on the NBN Gateway (accessed on 25 September 2009) showed 13 records from 1892 to 1946. Stubbs and Drake (2001) were able to cite only one recent record in Scotland, from Linn of Dee, near Braemar in Deeside found by A.J. Halstead in 1998. In 2005 the Scottish Government placed it on the Scottish Biodiversity List, as it was considered Nationally Rare at the UK level (found in fewer than 15 hectads).

I found the fly for the first time in 2007 near Dingwall (NH55, V.C. 106, East Ross). This was substantially farther west than previous records. In August 2009, whether by luck, greater experience, or because it was a particularly good year for the species, I found 5 individuals at 4 sites as far west as Strathconon (NH35), and at Strathpeffer (NH45), Ardersier (NH75) and Grantown-on-Spey (NJ02), in V.C. 106 East Ross, V.C. 96 Easterness and V.C. 95 Elgin. Correspondence with other entomologists has resulted in the accumulation of other recent records, from Andy Godfrey (Deeside, 2001), Ivan Perry (Strathspey and Moray, 2006-2007) and Mick Parker (Culbin, 1997-2006). It became obvious that the species was a lot less scarce and more widespread than previously suspected. The current map is shown in Fig. 1. On this basis it still qualifies for the Scottish Biodiversity List, but more searching would certainly remove its claim.

The late flight time is probably a significant factor in it being overlooked, 64% of records occurring after 1 August (Fig. 2), 55% in August, and 36% in the first half of that month.

There are too few records to describe the habitat confidently. All six flies I have seen were in or close to trees, either on the edge of a stand, or in a clearing. All were basking in the sun: four on bare ground, one on a stone wall, and the other on the potato plants in my garden! Most were encountered when I was searching for solitary aculeates or ants, and therefore targeting the warm dry habitats these prefer. There was no evidence of an association with large rivers as hinted in Stubbs and Drake (2001).

Entomologists visiting the north of Scotland in late summer, and especially during August, should be aware of the possibility of *T. handlirschi* on sunlit bare ground near forest

anywhere from East Ross south and east to Strathspey and Deeside. A male and a female have been deposited in the National Museums of Scotland collection in Edinburgh.

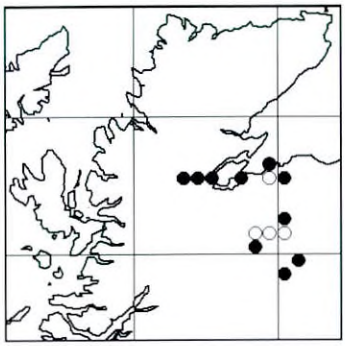

Fig. 1. The distribution of *Thereva handlirschi* in Scotland. Open circles: pre-1950; solid symbols: 1996-2009.

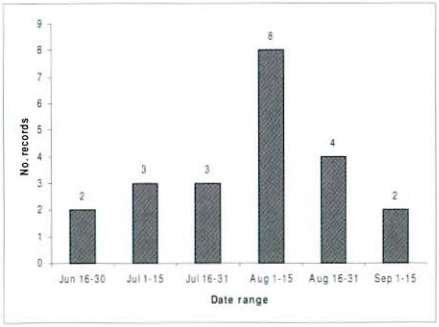

Fig. 2. The phenology of *Thereva handlirschi* in Scotland. Extreme dates are 30 June to 8 September. Numbers of records are shown above the bars. N = 22.

Other recent notable records follow. All were collected by me, except where stated.

Asilidae:
Machimus cingulatus (Fabricius, 1781): a female was taken on the edge of a mixed plantation at Strathpeffer on 9 September 2009. This is an extension NW of its known range (Stubbs and Drake 2001), and the habitat is not typical. The specimen is in the National Museums of Scotland collection.

Neoitamus cyanurus (Loew, 1849): a female was photographed by Jane Bowman on 9 July 2009 in Glen Moriston (NH31, V.C. 96, Easterness). This is significantly farther west than other mapped records in Highland.

Rhadiurgus variabilis (Zetterstedt, 1838): two males were taken on coastal heath at Meikle Ferry Links (NH78, V.C. 109, East Sutherland) at the end of June 2009. This is also a significant northward extension to the range described in Stubbs and Drake (2001). The specimens are in the National Museums of Scotland collection.

Dioctria cothurnata Meigen, 1820: a male was taken on 21 August 2007 in a sand quarry near Inverness (NH74, V.C. 96, Easterness). This is one of very few recent records from this area, where the NBN Gateway map shows a number of records from before 1960.

Rhagionidae:
Rhagio notatus (Meigen, 1820): this fly was present in large numbers in open woodland on the River Conon (NH55, V.C. 106, East Ross) on 24 May 2009; *R. scolopaceus* was present but much less numerous.

Tabanidae:
Atylotus fulvus (Meigen, 1804): this species was rediscovered in Scotland after a gap of over 70 years by Jane Bowman in Glenmoriston (NH21 and NH31) in 2005. It has been found occasionally in the same area up to 2009, between 21 June and 23 September.

Hybomitra lurida (Fallén, 1817): a male was seen on the Monadh Mor (NH55, V.C. 106, East Ross) on 19 May 2009. It was recorded there in 1984 (BRBI). The specimen is in the National Museums of Scotland collection.

Tabanus cordiger Meigen, 1820: a male was taken at Tarbet (NC14, V.C. 108, West Sutherland) on 4 August 2009. There is an isolated cluster of records from that area extending back to 1911.

Tachinidae:
Phasia hemiptera (Fabricius, 1794): a female was taken in my garden at Strathpeffer on 25 July 2009. This is well north of the previous known limit in Perthshire (http://tachinidae.org.uk/site/get-species.php?brcno=11602, accessed 8 June 2010). The specimen is in the National Museums of Scotland collection.

Tachina ursina (Meigen, 1824): two were found in spring 2010 well north or west of the few other Scottish records (http://tachinidae.org.uk/site/get-species.php?brcno=15704, accessed 8 June 2010). The first was taken by Carl Farmer on 20 April 2010 at Inverawe (NN03, V.C. 98, Main Argyll). The other was photographed by Jane Bowman on 3 May 2010 in Glenmoriston (NH31).

Therevidae:
Acrosathe annulata (Fabricius, 1805): a male was taken by Jimmy McKellar on Rosemarkie Beach (NH74, V.C. 106, East Ross) on 2 July 2000. This is a considerable northward extension of the known range from the limit in Strathspey given by Stubbs and Drake (2001).

Acknowledgements
I am very grateful to Ivan Perry, Mick Parker and Andy Godfrey for permission to use their records of *Thereva handlirschi*; and to Jane Bowman, Carl Farmer and Jimmy McKellar for other records as noted above. Richard Lyszkowski identified the *Phasia*, and Chris Raper the *Tachina ursina* from Glenmoriston from a photograph on Diptera.info. Dataset providers and the NBN Trust bear no responsibility for the analysis or interpretation of data obtained from the NBN Gateway.

References

Stubbs, A.E. and Drake, M. 2001. *British Soldierflies and their allies.* British Entomological and Natural History Society, Reading.

The South American fungus gnat *Sciophila fractinervis* Edwards, 1940 (Diptera, Mycetophilidae) present in Britain - One of the South American species of fungus gnat recorded from nurseries in The Netherlands by P.J. Chandler and J. Pijnakker (2008. Tropical fungus gnats established in nurseries in The Netherlands (Diptera, Keroplatidae and Mycetophilidae). *British Journal of Entomology and Natural History* **22,** 81-93) has now been found in Britain. This is *Sciophila fractinervis* Edwards, 1940 (Mycetophilidae), which, in The Netherlands, was found in association with cultivated *Platycerium* (Polypodiaceae) and *Beaucarnea* (Nolinaceae). There was no evidence of any damage to the plants concerned .

Chandler and Pijnakker (*op. cit.*) suggested that it was possible for tropical species of fungus gnats to be introduced into the British Isles through the horticultural trade, although to date, none of the three South American species of Keroplatidae found in the Netherlands have been discovered here. In February 2010 a sample of fungus gnats that had been found in a glasshouse at Warwick HRI (Horticultural Research International), Wellesbourne, Warwickshire was sent to me. These gnats were associated with plants of 'Lisianthus' (*Eustoma grandiflorum*, Gentianaceae), otherwise known as Texas bluebell or prairie gentian, although it did not seem that they had caused any damage to these plants.

Fig. 1. Lisianthus plant with leaves held back to reveal a larval web of *Sciophila fractinervis* on a lower leaf.

Fig. 2. Larva of *Sciophila fractinervis* in its web on a lower leaf of a Lisianthus plant.

The Lisianthus had been grown from seed at Wellesbourne, but different species of plants in the same glasshouse had come as cuttings from other parts of the world. Webs containing similar larvae, possibly of the same species, had been observed on Christmas cacti (*Epiphyllum*, Cactaceae) soon after they had arrived at the glasshouse, but no flies were found on, nor reared from them. The Christmas cacti had received several treatments of a parasitic nematode *Steinernema*, a treatment regularly used to control sciarid flies but it is not known if this treatment had any effect on the imported larvae.

The samples forwarded to me from Wellesbourne included a male and female of the adult gnat, plant material bearing loose silky webs containing apparently mature larvae and cocoons within which pupae could be seen. The webs were on basal leaves of the living plant and over dead leaves lying on the surface of the compost. The larvae showed no sign of feeding and the leaves received with them were undamaged. Fig. 1 shows a plant with a larval web on a basal leaf and this is shown enlarged in Fig. 2. The slender worm-like larvae moved rapidly in their webs. After a few days each of the remaining larvae had pupated within an elongate loose white cocoon (Fig. 3) with the pupae clearly visible towards one end. Adults comprising two males and three females, emerged within a week and had the characters of *Sciophila fractinervis* of which the wing and male genitalia were figured by Chandler and Pijnakker (*op. cit.*). A larva received subsequently has been preserved.

This gnat has a mainly yellowish brown thorax, a shinier darker brown abdomen and yellow legs. The males had wing length 2.5-2.6mm and the females wing length 3.0-3.2mm. This species may be distinguished from the other four known Neotropical species of *Sciophila* using the key provided by P.J. Chandler (2006. The Neotropical species of *Sciophila* Meigen (Diptera, Mycetophilidae). *Studia dipterologica* **13,** 19-27).

Fig. 3. Cocoon of *Sciophila fractinervis* attached by threads to a Lisianthus leaf and the substrate; the dark pupa can be seen within towards the left end of the cocoon.

Most species of this mainly Holarctic genus that have been reared have developed either within fruiting bodies of larger fungi or have produced larval webs on the surface of the fungus. where they were considered to be spore feeders. Web-spinning larvae in other genera of fungus gnats are predaceous on small organisms that become trapped in their webs, though there was no evidence of this here. The biology of *Sciophila* species from other zoogeographic regions, including those from South America, is practically unknown but an association with higher plants is possible in another South American species *S. ocreata* Philippi, 1865 that has become established in New Zealand (Toft, R.J. & Chandler, P.J. 2004. Three introduced species of Mycetophilidae (Diptera: Sciaroidea) established in New Zealand. *New Zealand Entomologist* **27,** 43-49).

It cannot be established whether *S. fractinervis* arrived at Wellesbourne directly with an plant imported either from continental Europe or its country of origin, or whether it came from another location in the British Isles where it had been introduced previously. It is possible that this species may be found in glasshouses and nurseries elsewhere in Britain and it is hoped that future observation may assist in determining its biology more precisely.

I am grateful to Jane Smith for referring this material to me, Rosemary Collier who provided the photographs reproduced here, Jayne Akehurst and Veronica Valdes, all of Warwick HRI, for information and assistance - **P.J. CHANDLER,** 606B Berryfield Lane, Melksham, Wilts SN12 6EL

Dipterists Digest 2010 **17**, 53-59

Dasineura oxycoccana (Johnson, 1899) (Diptera, Cecidomyiidae), a pest of cultivated blueberries, new to Britain

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Summary

Dasineura oxycoccana (Johnson), a major pest of cultivated *Vaccinium* species in North America, is added to the British list after having been found on commercial blueberry crops at eight locations around England.

Introduction

In the last few years the extent and value of commercial blueberry production in the United Kingdom has dramatically increased, and all indications suggest that the sector will continue to grow. In June 2008, the plant health authorities for England and Wales were contacted by a private crop consultant concerned about a cecidomyiid infestation in a blueberry (*Vaccinium corymbosum*) crop at a nursery in Herefordshire. Samples of infested plants were sent to the then Central Science Laboratory (CSL) near York, first by the consultant, and then, following a subsequent visit to the site, by a Plant Health and Seeds Inspector (PHSI) from the Department for Environment, Food and Rural Affairs. A number of live larvae were found to be on the plants. A 21 x 12 x 8 cm open Perspex container was prepared as a rearing chamber by half filling it with damp fine sand topped with damp laboratory tissue paper. Infested leaves were placed on top of the paper and the top of the box covered with fine muslin carefully sealed down with masking tape. The box was then placed into an incubator at 23°C and checked daily. Any adults that emerged were collected using a pooter and stored in 70% ethanol. The adults were then identified as *Dasineura oxycoccana* (Johnson) by K.M. Harris, an identification that was subsequently confirmed by Dr R.J. Gagné of the United States Department of Agriculture (USDA), Washington DC, after comparing the male genitalia of the British specimens against those of *D. oxycoccana* in the USDA collection originating from the USA (Georgia, Massachusetts), Canada (British Columbia) and Sweden.

In June 2009, the PHSI (now part of The Food and Environment Research Agency (FERA) along with the former CSL) carried out a survey of blueberry crops in England and Wales, looking for *D. oxycoccana*. The pest was found to be present at a number of additional nurseries and production sites across England, in all cases on *V. corymbosum*: one site in Hampshire, two sites in Kent, two sites in Norfolk, and two sites in Lancashire. Experience with the initial 2008 population had shown that rearing adults in the laboratory was time consuming, with only a small proportion of the larvae successfully reaching adulthood. The number of larvae present in the samples of infested leaves sent to the laboratory from each of the 2009 sites was much smaller (fewer leaves per sample) and, as a result, no attempt was made to rear adult flies. Larvae, however, appeared identical to those seen the year before (and were confirmed as being consistent with *Dasineura* by KMH). Damage symptoms were also consistent with those seen in the initial case the year before. In order to confirm that the identity of the larvae from each site was indeed *D. oxycoccana,* their mitochondrial Cytochrome Oxidase I (COI) DNA sequences were compared to sequences

obtained from the 2008 population of *D. oxycoccana*, whose identity had been confirmed after morphological examination. In each case, the COI sequences could not be statistically separated from the sequences obtained from the original 2008 population.

Fig. 1. Damage to blueberry leaves caused by *Dasineura oxycoccana*.

Dasineura oxycoccana is native to North America (found from Canada to the Gulf Coast), where it is a damaging pest of cultivated *Vaccinium* species, including *V. corymbosum* (highbush blueberry), *V. ashei* (rabbiteye blueberry) and *V. macrocarpon* (cranberry) (Steck *et al.* 2000). In the USA, where the midge occurs on cranberry, it is known as cranberry tipworm; however, when on blueberry it is often referred to as blueberry gall midge and this is the common name that has been applied to the species in all British publicity material. The midge was first recorded in Europe in Italy in 1996, and has subsequently been reported from Latvia (2002, named wrongly as '*D. vacinii*' with no authority given) and Slovenia (2004) (Bosio *et al.* 1998, Apenite and Cinitis 2006, EPPO 2006).

The adult females oviposit between the developing floral or vegetative bud scales (Dernisky *et al.* 2005). The larvae then develop protected by the unopened leaves or flower buds. The midge is present in both northern and southern states in the USA, and there appears

to be a climatic demarcation between populations that attack leaf buds only and populations that attack both flower and leaf buds. This is probably related to timing of the emergence of adults from over-wintering pupae. Thus, in south-eastern Georgia adult midge populations are usually low through the period when the flower buds are most susceptible to damage, whereas in southern Florida, where the adults are able to emerge earlier, the flower buds are attacked causing severe economic losses (Lyrene and Payne 1995, Dernisky *et al.* 2005). At the English sites, damage symptoms have been consistent. In each case, the larvae have attacked the young vegetative shoots of the blueberries, causing leaf distortion, blackening and death of the young buds (Fig. 1). There have been no reports of damage to fruit buds, as was also the case in Italy (Bosio *et al.* 1998).

Fig. 2. *Dasineura oxycoccana* final instar larva.

The larvae vary, with increasing development, from translucent-white, through yellow to an orange hue (Fig. 2). They are when mature about 1-2 mm long and 0.3 mm wide. In North America, in cranberry there can be a number of successive generations in a single year; the larvae spin a silken cocoon within which they pupate. This occurs within the damaged tip except for the final generation each year, which pupates in the soil where they over-winter. Adults emerge in the spring to mate and lay eggs (Lyrene and Payne 1995, Fitzpatrick 2009). The life history of the midge under British conditions has yet to be investigated.

Anecdotal evidence provided by the grower at the original site suggests that the midge had been present in his crop for at least a year. Given that the midge appears to already have a wide distribution within England, it has been proposed that the plant health authorities will take no official control action.

Fig. 3. *Dasineura oxycoccana* wing.

Identification

Dasineura oxycoccana is a relatively small species of *Dasineura* with a wing-length (arculus to apex) of 1.0-1.5 mm and with the main longitudinal vein R5 curved forward and joining the costa well before the wing apex (Fig. 3). The antennal flagellum consists of 13 segments in both sexes and male flagellomeres have long, narrow necks, almost half the total length of the flagellomeres. The male genitalia (Fig. 4) have conspicuous parameres alongside the aedeagus and relatively short, narrow gonostyles. These characters are typical of most of the 260 or so species of *Dasineura* known to occur in Europe. Morphological differences between these species are slight and practical identification of adults and larvae is therefore usually based on host plant associations and symptoms. When necessary, identification of *D. oxycoccana* is most easily confirmed by DNA sequencing.

In this case, mitochondrial COI DNA sequences were obtained from individuals from the original sample from Herefordshire, where the identity of the gall midge had been confirmed as *D. oxycoccana.* COI sequences were also obtained from larvae from each of the 2009 sites and these were compared to sequences from the Herefordshire site material and to sequences for species of *Dasineura* available from an on-line database (Genbank). The percentage variation in the sequences between the species of *Dasineura* (6 species, 68 individuals) was 17.7%, but only 0.7% between the known individuals of *D. oxycoccana.* When the variation data was used to produce a species identification tree (Fig. 5), the putative *D. oxycoccana* individuals (2009 material) clustered with the known *D. oxycoccana* individuals, confirming the diagnosis.

Fig. 4. *Dasineura oxycoccana* - male genitalia, ventral view.

The taxonomic treatment of the various gall midge species associated with *Vaccinium* in North America and in Europe is complex and little is known about most of the species recorded in the literature. Barnes (1948) reviewed what was known at that time about the described and undescribed species on blueberry, cranberry and bilberry, including *Dasineura oxycoccana* (as *Dasyneura vaccinii* Smith, which is now considered to be a synonym). This is the main pest species on blueberry in North America and it is now a potential pest of this crop in Europe, but there are other species that cause similar damage, notably *Prodiplosis vaccinii* (Felt), another North American species that has been recorded in Europe attacking blueberries in south-western Spain (Calvo *et al.* 2006). This species belongs in the supertribe Cecidomyiidi, whereas *D. oxycoccana* belongs in the Lasiopteridi, and these species are easily distinguished by morphological characters of adult, larval and pupal stages. Thus for instance, final instar *Prodiplosis* larvae have a terminal pair of recurved corniform papillae, whereas *Dasineura* larvae do not. *Prodiplosis vaccinii* has not yet been found in Britain.

Voucher specimens of males (slides 20628, 20629 and 3 specimens in a glass vial), female (slide 20627) and larvae (2 on slide 20630) will be deposited in the Natural History Museum, London. Further specimens have been deposited in the FERA collections.

Acknowledgements

We are particularly grateful to Roger Umpelby who first alerted us to the possible presence of a non-indigenous gall midge in British blueberry crops, to Dr R. J. Gagné of the United States Department of Agriculture for confirming the species identification; and to all the PHSIs who carried out the 2009 survey.

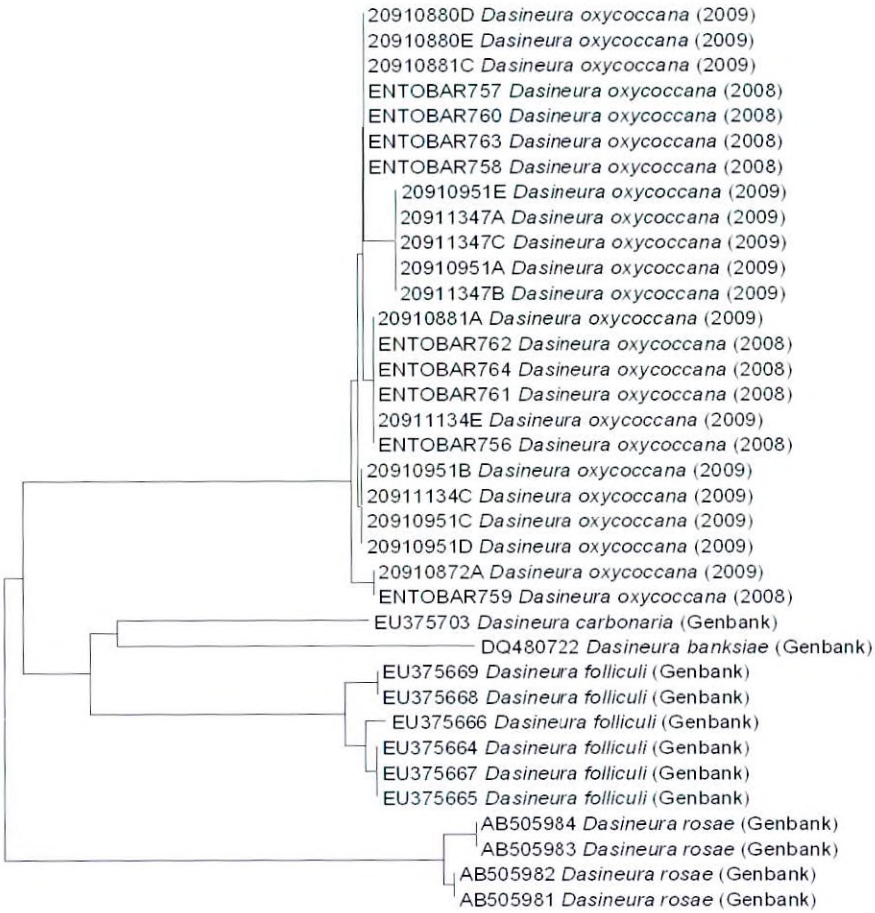

Fig. 5. Species identification tree showing the 2008 and 2009 *Dasineura oxycoccana* individuals, clearly delineated from *D. carbonaria* Felt, *D. banksiae* Kolesik, *D. folliculi* Felt and *D. rosae* (Bremi) (= *Wachtliella rosarum* (Hardy)).

References

Apenite, I. and Cinitis, R. 2006. Major pests in cranberry plantations. *Journal of Fruit and Ornamental Plant Research* **14** (Suppl. 3), 133-136.

Barnes, H.F. 1948. Gall midges of economic importance Vol. III: gall midges of fruit. Crosby Lockwood & Son, London, 184 pp.

Bosio, G., Bogetti, C., Brussino, G., Gremo, F. and Scarpelli, F. 1998. *Dasineura oxycoccana*,

a new pest of blueberry (*Vacinium corymbosum*) in Italy. *Informatore Fitopatalogico* **11**, 36-41. [in Italian]
Calvo, D., Molina, J.M. and Skuhravá, M. 2006. *Prodiplosis vaccinii* an introduced pest of blueberries in southwestern Spain. *Acta Horticulturae* **715**, 519-523.
Dernisky, A.K., Evans, R.C., Liburd, O.E. and Mackenzie, K. 2005. Characterization of early floral damage by cranberry tipworm (*Dasineura oxycoccana* Johnson) as a precursor to reduced fruit set in rabbiteye blueberry (*Vaccinium ashei* Reade). *International Journal of Pest Management* **51** (2), 143-148.
EPPO. 2006. New pests found in Slovenia. *EPPO Reporting Service. Report No. 2006/160.*
Fitzpatrick, S.M. 2009. Insect life histories in fruit, shoot and root environments of cranberry and blueberry. *Acta Horticulturae* **810** (1), 231-249
Lyrene, P.M. and Payne, J.A. 1995. Blueberry gall midge: a new pest of rabbiteye blueberries. *Journal of Small Fruit and Viticulture* **3** (2/3), 111-124.
Steck, G.J., Lyrene, P.M. and Payne, J.A. 2000. Blueberry gall midge, *Dasineura oxycoccana* (Johnson) (Insecta: Diptera: Cecidomyiidae). The Institute of Food and Agricultural Sciences, University of Florida. Document EENY-136 (available on-line at: http://edis.ifas.ufl.edu/pdffiles/IN/IN29300.pdf. Accessed March 23rd 2010)

Changes to the Irish Diptera List (12) – Editor

This section appears as necessary to keep up to date the initial update of the Irish list in Vol. **10,** 135-146 and the recent checklist of Irish Diptera (Chandler *et al.* 2008). Species are listed under families, but with references listed separately. The additions cited below include those added in the present issue in notes by Chandler & O'Connor and Godfray, and bring the total Irish list to **3325** species.

Ceratopogonidae
Forcipomyia brevipennis (Macquart, 1826) (added by Chandler & O'Connor 2010)

Tephritidae
Campiglossa producta (Loew, 1844) (added by Chandler & O'Connor 2010)

Agromyzidae
Phytomyza aquilegiae Hardy, 1849 (added by Godfray 2010)
Phytomyza leucanthemi Hering, 1935 (added by Godfray 2010)
Phytomyza artemisivora Spencer, 1971 (added by Godfray 2010)
Phytomyza soenderupi Hering (added by Chandler & O'Connor 2010)
Phytomyza spinaciae Hendel, 1935 (added by Godfray 2010)

Ephydridae
Scatella tenuicosta Collin, 1930 (added by Chandler & O'Connor 2010)

Calliphoridae
Pollenia angustigena Wainwright, 1940 (added by Chandler & O'Connor 2010)
Pollenia pediculata Macquart, 1834 (added by Chandler & O'Connor 2010)

Further British records of *Phytomyza astrantiae* (Hendel, 1924) (Diptera, Agromyzidae) and its parasitoids – Homan recently added this species to the British List (Homan, R. 2009. *Phytomyza astrantiae* (Hendel, 1924) (Diptera, Agromyzidae) new to Britain *Dipterists Digest* (*Second Series*) **16,** 183-184), it having been present in his Gloucestershire garden since 2005, and noted other records from around the country. This species has been abundant in my garden at Goring Heath, Oxfordshire (SU6779) mining *Astrantia major* since 2005 or earlier (I had not realised it was unrecorded in Britain). From a collection of mines made on 20 May 2006 I reared 43 flies and 16 specimens of the alysiine wasp *Dacnusa laevipectus* Thomson 1895 (Hymenoptera, Braconidae). The same year I also collected a female of the chalcid wasp *Chrysocharis viridis* (Nees, 1834) (Hymenoptera, Eulophidae) apparently ovipositing into a *P. astrantiae* larva. Both species of parasitoid are relatively polyphagous and are common in Britain on *Phytomyza* species attacking Apiaceae. *Dacnusa laevipectus* has been recorded from this host in Poland (Griffiths, G.C.D. 1966. The Alysiinae parasites of the Agromyzidae Part III. *Beiträge zur Entomologie* **16,** 775-950). Two further braconid species have been recorded from this host (Griffiths *loc. cit.*) and I would be interested to see any further reared parasitoids – **H.C.J. GODFRAY,** Department of Zoology, South Parks Road, Oxford OX1 3PS

An unusual inland record of the rare soldierfly *Odontomyia ornata* (Diptera, Stratiomyidae) – I was commissioned by the Royal Society for the Preservation of Birds to survey the aquatic macro-invertebrates of their Otmoor Reserve, Oxfordshire, which lies in the floodplain of the River Ray just north of Oxford. Large parts of Otmoor were drained in the 1960s and 1970s for arable farming. The RSPB have restored part of the floodplain to pasture and reedbed for the benefit of waders and since 1997 have dug a dense network of ditches, gutters and scrapes. On 24-25 July 2009 I sampled 25 of the water-bodies in the area called Greenaways Field (SP5613). As well as large larvae of *Odontomyia tigrina*, which I expected here, in three of the newly dug ditches I found well-grown larvae of *Odontomyia ornata*. In another ten water-bodies there were small larvae (5-12mm, mostly 7-8mm) that had hooks on the sternites second and third from the end of the larva; this is the character used to identify *O. ornata* (Rozkošný, R. 1982. *A biosytematic study of the European Stratiomyidae* (*Diptera*). 2 vols. Junk, The Hague). These larvae resembled *O. tigrina* in having a dense covering of short hairs and lacking the long hairs characteristic of large *O. ornata* larvae. These larvae were probably aberrant *O. tigrina* but I would have had to rear them to a later instar to be sure of their identity. If it turns out that they are *O. ornata*, then its population here is substantial.

Odontomyia ornata is a rare species that is almost confined to ditches on grazing marshes near the coast or in nearby river valleys; populations on the Somerset Moors represent the most inland recent records (Drake, C.M. 2005. Aquatic Stratiomyidae (Diptera) on grazing marshes. *Dipterists Digest (Second Series)* **12**, 87-90). There appear to be no recent records away from coastal marshes (NBN Gateway, accessed August 2009) but there are a few old records made between 1894 and 1953 for west London and near Swindon. These old records are from either end of the Thames catchment, and the occurrence of *O. ornata* at Otmoor suggests that it has been overlooked recently in the intervening catchment – **C. MARTIN DRAKE,** Orchid House, Burridge, Axminster, Devon EX13 7DF

***Chetostoma curvinerve* Rondani, 1856 (Diptera, Tephritidae) in Peterborough -** On 6 May 2010 a tephritid was very briefly observed sitting on a black currant (*Ribes nigrum*) leaf in my garden. The general appearance and early time of year suggested that the fly was *Chetostoma curvinerve* (Rondani, 1956). On the next day, this time armed with a net and camera, the fly was again seen in nearly the same place, vigorously waving its wings whilst walking over the leaf. The position on a bush would have been awkward with a net so a picture was taken on digital macro + telephoto lens. Moments later the fly departed and was not seen again. The picture (Fig. 1) is clearly identifiable even though the angle of view is not ideal: the very long bristles at the front of the jowls are distinctive, the wing pattern and body colour are correct for this species (the oblique view does not reveal the marked curve of vein R_{4+5}).

Fig. 1. *Chetostoma curvinerve* on black currant leaf at Peterborough.

On 16 May I again observed an individual of this insect on black currant bushes in my garden, for periods hiding underneath the leaves. For wing-waving display on the upper surface, it seemed to prefer leaves protected within the bush but, in the heavily clouded conditions, some display took place in full view.

My only previous encounter with this species was when I captured a female in a garden at Hawksworth, in Wealden Sussex, on 12 May 1973, at the time believed to be only the second British specimen (Stubbs, A. 1975. *Proceedings of the British entomological and natural history Society* pp. 103-105; includes a full page drawing of the fly by Cyril Hammond). The RES Handbook to Tephritidae (White, I.M. 1988. *Handbooks for the*

Identification of British Insects **10,** 5a) attributed records to five southern counties, describing it as 'very rare' but it has been found increasingly in recent years and has apparently been spreading northwards. There are 36 10 km squares scattered over much of southern England indicated for it on the latest available map (Clemons, L. 2008. Updated distribution maps of the Tephritidae (Diptera) of Britain and Ireland, downloaded from: http://www.dipteristsforum.org.uk/documents/TEPHRITIDAE_MAPS_SEP08.pdf) .

The main enigma is the unknown larval food plant, though its closest allies develop in fruits of various kinds. The main lead is that the fly is sometimes found in gardens rather than the countryside, but its occurrence is so sporadic as singletons that a pattern that might confirm a plant association has been elusive. Whilst the appearance of this fly in my Peterborough garden may have been due to random straying from where it developed, at least the available options can be considered, noting that this is a relatively large species.

Black Currant *Ribes nigrum*: both sightings were on a black currant bush, in flower at the time. No affected fruit has been found when harvesting previous years' crops. The berries are seemingly too small to support a large larva but note the use of honeysuckle (*Lonicera* species) by another species mentioned below. [Ornamental flowering currant *Ribes sanguineum* in the garden has even smaller fruits].

Cherry Laurel *Prunus laurocerasus*: large bushes in a neighbour's garden over-tower part of my garden and were in flower at the time. As a garden plant with large enough fruit it is the best candidate, noting also that entomologists are not in the habit of searching for larval infected berries. It is a native of the South Caspian/Turkey/Black Sea basin, poorly worked ground for dipterists, but it is planted widely in the parts of Europe where sparse records of the fly have been made. [A pink flowering cultivar of Cherry Plum *Prunus cerasifera* grows in my garden but this does not produce fruit; this non-native shrub is plentiful in the surrounds of Peterborough and is widespread in much of the southern half of England]

Apple *Malus domestica* seems very unlikely. Chinese Quince *Chaenomeles speciosa* has very hard fruits. Raspberry *Rubus idaeus* and blackberry *Rubus fruticosus* agg. are too widespread in town and country to have escaped detection of a large 'maggot', and blackberry flowers too late for the fly's flight period.

Rose *Rosa* species: rose hips support the larva of *Rhagoletis alternata* (Fallén, 1814), a tephritid of similar size and wing-pattern (*Rhagoletis* has a rusty brown abdomen, lacks markings at the base of the wing and lacks the striking curve in vein M). The adult is seen when wild roses are in flower and the larva develops in the autumn. There are two further *Rhagoletis* species on the British list but the host berries are not available in my garden: *R. meigenii* (Loew, 1844) is very rare on *Berberis* and *R. cerasi* (Linnaeus, 1758) is sometimes imported in cherries and in mainland Europe can also use honeysuckle *Lonicera* berries.

Honeysuckle *Lonicera periclymenum*: there is a thriving plant on a fence only 4 m from where the fly was seen. This produces abundant berries. The flower buds are not usually visible until some time in the second half of May.

Holly *Ilex aquifolium*: a bush in the garden is well trimmed and does not yield berries. The surrounding neighborhood provides better options, including a long tall hedgerow in a cemetery about 300 m away.

Chetostoma curvinerve evidently moves about away from its foodplant, a habit designed to confuse dipterists! Whilst the above may not be the correct options, the foodplant is most likely to be flowering during the early adult flight period, perhaps a non-native which is not widespread in the countryside - **ALAN STUBBS,** 181 Broadway, Peterborough PE1 4DS

Hampshire records of *Chromatomyia aprilina* Goureau 1851 (Diptera, Agromyzidae) – an under-recorded leaf miner? - On 10 April 2010, approximately 20 leaf mines of *Chromatomyia aprilina* (example in Fig. 1) were noted on honeysuckle *Lonicera periclymenum* in Stoke Park Woods near Eastleigh, Hampshire (V.C. 11). The larval mine usually begins at the midrib and is initially stellate, with a series of short galleries into the leaf blade, becoming linear later, with the sections on the upper surface appearing disconnected where feeding occurs on the lower surface. Frass occurs in conspicuous long black lines along the edge of the mine. The last gallery to be made is often much longer than the others, loosely following the leaf margin. Pupation is internal in a lower-surface chamber with anterior spiracles penetrating the leaf epidermis (Spencer, K.A. 1972. Diptera, Agromyzidae. *Handbooks for the Identification of British Insects* **10**(5g), 1-136). The pupa, 2-3 mm in length, is visible as a dark spot above the midrib in Fig. 1 and is shown in detail in Fig. 2.

Fig. 1. Leaf mine of *Chromatomyia aprilina*.

Chromatomyia aprilina is normally considered bivoltine with early summer and early autumn generations. However, in some years a very early spring generation forms and in these cases the mine can be formed somewhat differently away from the midrib with the initial stellate section much reduced. This is the form found here and was first discovered in February 2009 by Keith Palmer at Sevenoaks, Kent, and subsequently in March by Robert Homan at two sites in Gloucestershire (*British Leafminers*. http://www.leafmines.co.uk/html/Diptera/C.aprilina.htm [accessed 20/04/10]).

Fig. 2. Pupa of *Chromatomyia aprilina*.

Although widespread in Britain, records are scattered and in Hampshire are held only for Pamber Forest in 1994 and Fleet (both V.C. 12) in 2005. However, it has been suggested (R. Homan *pers. comm.*) that this is an under-recorded insect. With the recent development of user-friendly online guides to leafmines (e.g. The Leaf and Stem Mines of British Flies and Other Insects. http://www.ukflymines.co.uk/Flies/Chromatomyia_aprilina.html [accessed 20/04/10]), this situation may change, increasing familiarity with the mines and allowing identification without an adult specimen - **DAVID HUBBLE,** 28 St. Mary's Road, Eastleigh, Hants SO50 6BP

Dipterists Digest 2010 **17**, 65-72

The puparium and larval feeding behaviour of *Meiosimyza affinis* (Zetterstedt, 1847) (Diptera, Lauxaniidae)

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Summary
The puparium of *Meiosimyza affinis* (Zetterstedt, 1847) (Diptera, Lauxaniidae) is described and compared with the recently described puparium of the related species, *Pseudolyciella pallidiventris* (Fallén, 1820). The larva of *M. affinis* is a leaf surface feeder or gleaner in leaf litter where it gathers food, probably a mixture of fungal hyphae, microbes and algae, from both external and internal leaf surfaces. Several head and head skeleton features facilitate leaf gleaning including unusually long, narrow mandibles, a forward-directed pseudocephalon and a strengthened epipharyngeal plate. These features are shared with the larva of *P. pallidiventris* and may be diagnostic of lauxaniid larvae. The larva of *M. affinis* apparently feeds during the autumn and winter months. Pupariation takes place on leaves in early spring.

Introduction

Shatalkin (2000) raised the genus, *Pseudolyciella*, for species of *Lyciella* Collin, 1948 with a grey-yellow body colour, a univittate frons and absence of pteropleural bristles. Shatalkin (2000) also resurrected an apparently valid name that has priority for the remaining *Lyciella* species, *Meiosimyza* Hendel, 1925. However, the validity of this generic split has been little tested with biological data or phylogenetic methods and some authors continue to use the name *Lyciella* (e.g. Greve 2009). In fact, biologically, little is known of these flies although, in the British Isles, several of the fourteen *Meiosimyza* and *Pseudolyciella* (= *Lyciella*) species are common and widespread (Collin 1948). The slow-moving adults are often seen clustered on the underside of leaves of shrubs and trees where they apparently feed on fungal hyphae and have in common with other genera of lauxaniids, the terminal section of the mouthparts or, labellum, with specially modified pseudotracheal canals bearing prongs and scrapers for rasping (Broadhead 1984).

Larval development sites include dead leaves, bird nests and dead wood but Rotheray (2009) suggested that the usual development site is dead leaves. Previous authors have referred to lauxaniid larvae as 'mining' dead leaves (Miller and Foote 1975, 1976), although as Broadhead (1984) points out, they are unlike miners in green leaves because no characteristic feeding track is left behind. Unfortunately, few direct observations of larvae feeding have been made that enable development sites to be better understood and characterised. In this paper we report observations of this kind and describe the early stages, overwintering behaviour, distribution in Scotland and aspects of the life cycle of *Meiosimyza affinis* (Zetterstedt, 1847).

Methods

About 12 polythene bags of moist leaf litter were gathered from three localities: Ashfield near Dunblane, Hermitage Wood near Bridge of Allan in Stirlingshire and Pressmanan Wood in East Lothian in January 2010. Bags were taken back to the laboratory where they were hand searched for larvae. At this stage, although it was not possible to be certain of identification, small (<3-4mm long), translucent cyclorrhaphan larvae with tapering ends and long head skeletons were provisionally identified as lauxaniids and separated for rearing.

Each larva was reared individually in a Petri dish with decaying leaves on which they were found and stored in cool, dark conditions. The dishes were sprayed regularly with water to maintain levels of moisture. Larvae pupated on the leaves and following pupariation, individual leaves with a puparium were placed in a 75x25mm, corked, glass tube until adult emergence. Adults were identified using the key in Collin (1948), comparison with named specimens in the collections of the National Museums of Scotland (NMS) and finally, genitalia were extracted from a male and compared with the figures of *Lyciella* species in Remm and Elberg (1979).

To observe behaviour, individual larvae were located in their Petri dishes by carefully picking through the leaves. When a larva was located it was observed under subdued light with a binocular microscope. Five larvae were observed for a cumulative total time of about two hours. Detailed analysis of behaviour was made by attaching a digital camera to the objective of a binocular microscope and filming larvae. One feeding larva was filmed using this method. The film was then examined and stopped at various points to resolve details of the behaviour.

To describe puparia, they were removed from the leaf surface and cleaned in water. The puparium had been split at the front end by the emergence of the adult and the shield-shaped dorsal plate that had been loosened by the adult, was removed with forceps. This exposed the head skeleton just inside the lower, front margin of the puparium. The puparium was placed in a solution of hot potassium hydroxide for about 15 minutes which process cleared the head skeleton. However due to its fragile state, it was studied in situ. Drawings were made using a drawing tube attached to a binocular microscope. Measurements were made using a measuring eyepiece and morphological terms follow Rotheray and Gilbert (2008).

Results

A total of 13 lauxaniid larvae were obtained from moist to wet decaying leaves of beech (*Fagus*), oak (*Quercus*) and sycamore (*Acer*). Two larvae were taken on sycamore leaves at Ashfield near Dunblane, three on sycamore leaves from Hermitage Wood near Bridge of Allan and eight on sycamore and oak leaves from Pressmanan Wood in East Lothian. They were most frequent in places where leaves formed compacted layers in depressions on the woodland floor. Larvae were usually found between the leaves and no leaf mining, i.e. rasping the internal tissues of leaves, was observed. However, one larva was found inside a broken leaf whose interior had liquefied. Larvae fed throughout January to April, as evidenced by accumulation of black material in the gut. Leaves were not consumed by larvae. One larva died before pupating but from late February to early March, eight larvae formed puparia on the leaf surface with adult emergence starting about four weeks later. Four females and two males emerged during the period 25 March to 2 April 2010. They were identified as *Meiosimyza affinis* (Zetterstedt, 1847).

When active, larvae moved through the surface film of water coating leaves and changed direction by sideways movements of the thorax. Larvae fed from leaf surfaces, either on or inside decaying leaves. The mechanism of feeding analysed from the film showed that it consisted of gathering food by repeated lunging. A lunge consists of the pseudocephalon expanding forwards and placing the oral cavity and the apex of the mouthhooks on the leaf surface and then contracting the pseudocephalon which pulls the oval cavity and mouthhooks over the surface. Every few minutes, a small amount of dark material could be seen leaving the back of the head skeleton and passing into the foregut.

Lunging rates varied but in the larva filmed, they were about two lunges per second. Potential barriers to feeding, such as raised leaf veins and adhering material, did not appear to interrupt feeding. On encountering prominent leaf veins, the pseudocephalon and head skeleton was twisted slightly to encompass the vein and lunging continued. Periodically, the larva would come to a standstill and the head skeleton could be seen quivering slightly. What was occurring at this point was unclear.

Observations of larval reactions in the laboratory to leaves drying out suggested they move down into deeper layers during dry periods but reverse the direction of movement when excess water is present. Standing water dislodged larvae from the leaf surface and caused them to float. They were unable to manoeuvre themselves onto a leaf and only regained contact with leaves once water levels subsided. Larvae always responded negatively to heat and light from a lamp by moving away to the underside of a leaf. During winter, larvae are subject to freeze-thaw cycles. Several larvae in bags of leaf litter were left outdoors where for two days, the leaf litter was completely frozen but on thawing in the laboratory, larvae resumed activity.

During searches of leaf litter, predatory muscid larvae (Diptera, Muscidae) were occasionally encountered (species not identified). To test whether muscid larvae were predators of *M. affinis* larvae, one individual of each species was placed on a leaf in a Petri dish. Within 20 seconds, the muscid larva attacked the larva of *M. affinis* and pierced at a mid ventral point with the mouthparts. The *M. affinis* larva attempted to roll away but the muscid had a firm grip. For over an hour haemolymph was imbibed after which the internal organs were torn apart by rapid movements of the head skeleton and consumed. Occasionally the mouthparts would be withdrawn and the muscid would 'feel' its way along the body to a different area appearing to probe at the integument to find an area it could pierce before imbibing liquid which presumably it could not access from its first attack point.

Distribution in Scotland

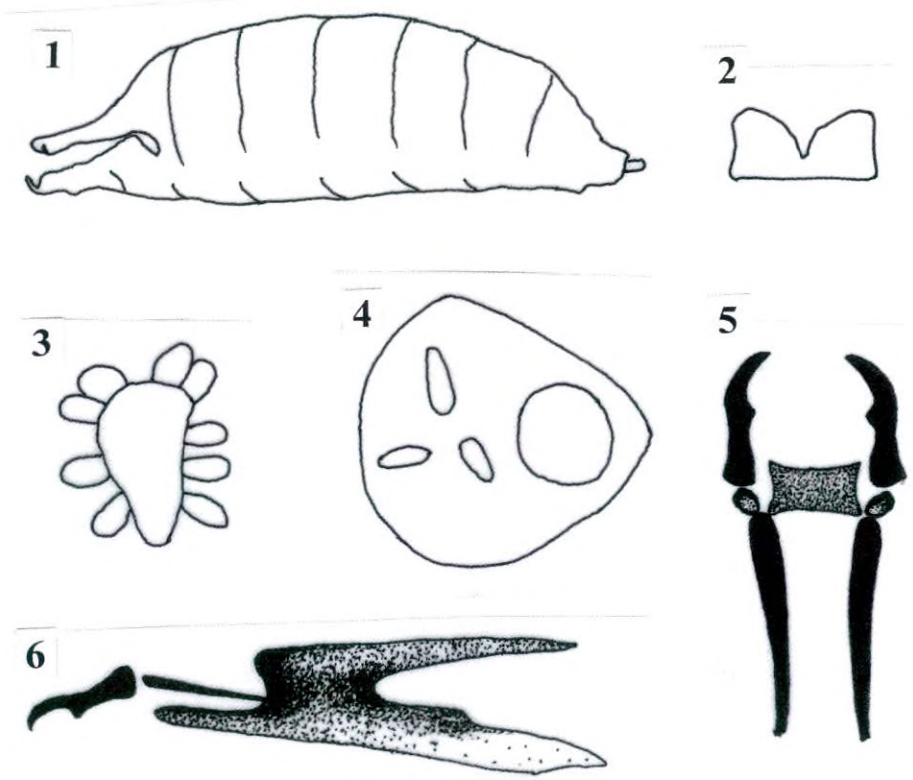
The NMS collection has 53 specimens of *M. affinis*. The oldest of these were collected by Percy H. Grimshaw from near Aberlady, Midlothian on 4.vi.1896 and from Burley-in-Wharfedale, Yorkshire in August 1897 and 1898. The Scottish specimens include 21 collected by J.R. Malloch from 1907 to 1909 at Bonhill, Dunbartonshire between 6 June and 10 August. Additional records are, in chronological sequence and one specimen per locality unless otherwise indicated:

Sutherland, Golspie, 2.viii.1900, Col. J.W. Yerbury;
Inverness-shire, Strathspey, Glen Feshie, 7-10.vii.1909, 3 specimens, P.H. Grimshaw;
Perthshire, Blairgowrie, , 4.vi.1913, A.E.J. Carter;
Inverness-shire, Corrour, moorland behind railway station, 2.vii.1914, 2 specimens, P.H. Grimshaw;
Inverness-shire, Loch Ossian, nr Corrour, woods around loch, 3.vii.1914, 11.vii.1914, 4 specimens, P.H. Grimshaw;
Argyllshire, Lephinmore (at light), 1.x.1951, E.C. Pelham-Clinton;
Fife, Wemyss, Moss Wood, 3.v.1964, E.C. Pelham-Clinton;
Perthshire, Rannoch, 31.v.1964, E.C. Pelham-Clinton;
Inverness-shire, Strathspey, Speybridge, 16.vi.1967, E.C. Pelham-Clinton;
Wester Ross, Rassal Ashwood, 26.v.2008, G.E. Rotheray;
Wester Ross, Kerry Wood, near Charlestown, 3 specimens, 28.v.2008, G.E. Rotheray.

Description of the puparium of *Meiosimyza affinis*

Shape and size: length 3.5-4mm, width 1-1.5mm; truncate and dorsoventrally flattened at either end and dome-shaped in the middle section; lateral margins evenly rounded; ventral surface flattened; uniformly dark brown in colour; anterior end split dorsolaterally by emergence of the adult, from just in front of the anterior spiracles on the prothorax to the posterior half of the first abdominal segment.

Anterior spiracles: length 0.06mm; sited on the upper, postero-lateral margin of the prothorax but due to the way in which the puparium has formed, this position is the anterior margin of the puparium; each spiracle consisting of an upright, fan-shaped structure inclined outwards with 9-10, pale spiracles.



Figs 1-6. Puparium of *Meiosimyza affinis* (Diptera, Lauxaniidae): 1, whole puparium, lateral view, head end to the left, length 3.5mm; 2, posterior breathing tubes, anterior view; 3, anterior spiracle, lateral view, base at lower margin, length 0.06mm; 4, spiracular plate, dorsal view, interspiracular setae missing; 5, anterior end of head skeleton, dorsal view, sclerotised section of epipharyngeal plate between the bases of the mandibles, mandibles on upper margin; 6, head skeleton, lateral view, anterior end to the left, length 0.9mm.

Head skeleton: length 0.9mm; mandibular sclerite, intermediate sclerite and parastomal bars strongly sclerotised; basal sclerite only strongly sclerotised on the anterior and posterior margins; mandibular sclerites joined dorsally by a curved, lightly sclerotised plate; mandibular sclerite elongate with rectangular base about as long as curved, apical hook and posteriorly, with peg-like dorsal and ventral articulation points; mandibular sclerite about half as long as intermediate sclerite (0.06 v 0.11mm); dorsally, intermediate sclerite separate from the basal sclerite; ventral and dorsal bridges lightly sclerotised; dorsal cornu narrow and parallel to the ventral cornu, slightly more than two thirds as long as ventral cornu (0.29 v 0.37mm); ventral cornu with a dorsal apodeme bearing a window; cibarial ridges present.
Vestiture: integument smooth, lacking vestiture and sculpturing although dried into wrinkles along the anterior and lateral margins of the prothorax and around the anus.
Locomotory spicules: bands of inconspicuous spicules in numerous rows encircling the metathorax and abdominal segments 1-7 but absent on dorsum of segment 7 and narrowing on the lateral margins of each segment; locomotory spicules evenly sized except for a few larger spicules in the middle rows of each segment; dorsal and ventral spicules of a similar size.
Anal segment: lateral margins with two pairs of triangular-shaped projections about as high as basally broad; posterior breathing tubes on dorsal apical margin.
Posterior breathing tubes; on short (<half as tall as apically wide) projections and separated by about half their apical width; each spiracular plate with three pairs of openings about equidistant from each other.

Discussion
Although he gave no supporting data, Collin (1948) stated that *M. affinis* is common in Scotland and he also referred to it being present in Cumberland, Suffolk and Cambridgeshire. According to the Scottish Insects Records Index maintained by the National Museums of Scotland, the only additional published Scottish records are from islands: Steel and Woodroffe (1968) recorded it from the Island of Rum and Nelson (1980) recorded it from Ailsa Craig. Despite the probability that it is an under-recorded species, data associated with specimens in the NMS collection suggests that it is widespread across central and northern rather than southern Scotland. Based on numbers of specimens per *Meiosimyza* and *Pseudolyciella* species in the NMS collection, *M. affinis* is not as common in Scotland as *Meiosimyza rorida* (Fallén) and *M. illota* (Loew), although the latter taxon may be a species complex (Collin 1948, Papp 1978a and b, Cole and Godfrey 2004). In her extensive study of Norwegian Lauxaniidae, Greve (2009) states that *M. affinis* is one of the commonest lauxaniids in southern and central Norway. The extent to which *M. affinis* is more common in Scotland than elsewhere in Britain requires further investigation.

Apparently the only rearing record of *M. affinis* is that of Collin (1948) who stated that he bred it from 'part of a rotten tree stump'. Rotheray (2009) discussed the range of breeding sites reported for *Meiosimyza* and *Pseudolyciella* species and suggested that the typical development site is dead leaves. The records and observations reported here for *M. affinis*, support this suggestion. The explanation of records from bird nests and dead wood, the other development media suggested for *Meiosimyza* and *Pseudolyciella* species, is that dead leaves are part of these media. Records from bird nests are probably due to birds taking leaves from the ground for their nests that coincidentally have on them, *Meiosimyza* and *Pseudolyciella* larvae or puparia. Records from dead wood may be due to leaves on dead trees and branches being used for oviposition by females. The extent to which lauxaniids from other genera reported from bird nests (Miller and Foote 1975) are similarly coincidental is unclear.

Our observations of feeding behaviour suggest that the larva of *M. affinis* does not mine leaves. We found larvae in accumulations of fallen, wet, decaying leaves where they live between the leaves rather than within them. Here they gather food, probably algae, fungi and microbes, from leaf surfaces by scraping with the mandibles, scooping with the pseudocephalon and sucking and filtering with the head skeleton. Such a way of life is likely to be typical of other lauxaniids developing in association with dead leaves. During leaf decay, however, the upper and lower epidermal layers may split apart and larvae will exploit such cavities if they encounter them but our observations suggest that they do not preferentially seek split leaves. As noted by Broadhead (1984), feeding tracks are characteristic of 'true' leaf miners but because the interior contents of dead leaves are liquefied, the *M. affinis* larva we observed within a leaf could not have left a feeding track. Based on these observations, it is probably inaccurate to refer to lauxaniid larvae as mining leaves.

Basic features of the larval trophic apparatus in *M. affinis* shared with other cyclorrhaphan larvae include a fleshy pseudocephalon that envelops and forms a sheath for the protrudable mouthhooks and a head skeleton comprising, from posterior to anterior end, a basal sclerite housing a suction pump and filter, an intermediate sclerite and a pair of mandibles. The mouth is between the mandibles and each mandible consists of a subrectangular base with an apical hook. Feeding is facilitated by a high level of flexibility that exists in the thorax, pseudocephalon, head skeleton and the mouthhooks. Each is capable of moving independently: movement by the thorax determines the direction of feeding and movements of the pseudocephalon, head skeleton and mouthhooks effect the rate and amount of food gathered.

There is a vast range of structural modification in larval heads and head skeletons across the Cyclorrhapha that suit feeding in particular circumstances and several such features appear to facilitate leaf gleaning in *M. affinis*. The mouthhooks are, in comparison with many other Cyclorrhapha, unusually elongate (rectangular base 3 or more times longer than broad) and set wide apart (separated by >2x width of rectangular base). Furthermore, the apical hook is not set above or below the rectangular base and in this relatively level position, the apex of the hook will be on the leaf surface during feeding lunges. Elongate and well separated mandibles suit lunging forward and scraping flat substrates and set-apart mandibles optimise the amount of food gathered during each lunge. Elongation of the head skeleton also includes the intermediate sclerite, which adds to the distance achieved during lunging. Furthermore, the orientation of the pseudocephalon is forwards not downwards as in frequent in many other cyclorrhaphan larvae and this also facilitates gleaning flat surfaces. However, at the point where the pseudocephalon is retracted at the end of a feeding lunge, the mandibles are inclined downwards. This is because the pseudocephalon rises as it contracts and the mandibles bend down from their point of articulation with the intermediate sclerite to cover the inevitable gap between the leaf surface and the mouth. This probably imposes a strain on the epipharyngeal plate above the articulation point which in most other cyclorrhaphan larvae is a glassy membrane (Rotheray and Gilbert 2008). In *M. affinis* however, this plate is strengthened by being sclerotised and appears as a distinct structure. Sclerotised epipharyngeal plates are present in other lauxaniid head skeletons (Miller and Foote 1976).

The only other lauxaniid head skeleton we have studied is that of *Pseudolyciella pallidiventris* (Fallén) and it possesses the features noted above in the head skeleton of *M. affinis* which although it was reared from a bird nest, may have been introduced there by the bird carrying leaves. The head skeletons of both species are very similar except that the dorsal cornu of *P. pallidiventris* is only about half as long as that of the ventral cornu whereas

in *M. affinis* it is two thirds as long. Another difference between the larvae of the two species is the dorsal vestiture, which in *P. pallidiventris*, consists of stiff, upright spicules but in *M. affinis* there is no vestiture other than rows of spicules similar in form to locomotory spicules on the ventral surface. By frictional forces, both upright and locomotory spicules probably anchor larvae in position when feeding either within or between leaves by engaging the surfaces above and below the larva. A firm grasp of the substrate is necessary to prevent slippage, which would otherwise make lunging ineffective.

When in leaf litter, larvae of *M. affinis* tended to remain between the leaves and in such a position they are hidden from view and close to food. However, larvae appear to move between layers of leaves according to how wet the conditions and avoid excessively wet or dry conditions. Furthermore, it was noticeable that larvae rested only when more than just the ventral surface was in tactile contact with a substrate, such as when the dorsal surface was touching the leaf above or the lateral surface was touching a raised leaf vein or the side of the Petri dish. Movement in relation to moisture levels, negative responses to light and thigmokinetic behaviour, in which movement is related to how much the body is in direct contact with a substrate, are probably the means by which larvae stay within favourable areas of the leaf litter. The extent to which predatory muscid larvae rely on leaf-gleaning lauxaniid larvae for food during the winter and are hence, a major mortality factor, requires more study.

Most Scottish records of adult *M. affinis* are from June to August within a range extending from early May to early October. We record here winter-feeding in the larva of *M. affinis*, but whether winter-feeding larvae are second generation larvae is unclear. If they are second generation larvae, this raises the question of where first generation larvae develop given that wet, decaying leaf litter is relatively scarce during the summer. But if the larva of *M. affinis* only occurs during the winter, then where are the eggs and early stage larvae from females occurring in June to August? Perhaps, they use other development sites or, are like certain phytophagous hoverfly larvae (Diptera, Syrphidae) that aestivate from early summer until the autumn/winter (Rotheray 1993). Further investigation of life cycles in *Meiosimyza* and *Pseudolyciella* is required to answer such questions.

Acknowledgements

We are grateful to Richard Lyszkowski for filming the larva of *M. affinis*.

References

Broadhead, E.C. 1984. Adaptations for fungal grazing in lauxaniid flies. *Journal of Natural History* **18,** 639-649.

Collin, J.E. 1948. A short synopsis of the British Sapromyzidae (Diptera). *Transactions of the Royal Entomological Society of London* **99,** 225-242.

Cole, J. and Godfrey, A. 2004. *Meiosimyza mihalyii* (Papp, 1978) (Diptera, Lauxaniidae) new to Britain with a note on the status of *M. obtusa* (Collin). *Dipterists Digest* (*Second Series*) **11,** 107-110.

Godfrey, A. 1994. *Lyciella stylata* Papp and *L. subpallidiventris* Papp (Diptera, Lauxaniidae) new to Britain. *British Journal of Entomology and Natural History* **7,** 81-84.

Greve, L. 2009. Atlas of the Lauxaniidae (Dipt. Brachycera) in Norway. *Norwegian Journal of Entomology* **56,** 75-116.

Miller, R.M. and Foote, B.A. 1975. Biology and immature stages of eight species of Lauxaniidae (Diptera) 1. Biological observations. *Proceedings of the Entomological Society of Washington* **77,** 308-328.

Miller, R.M. and Foote, B.A. 1976. Biology and immature stages of eight species of Lauxaniidae (Diptera). II. Descriptions of immature stages and discussion of larval feeding habits and morphology. *Proceedings of the Entomological Society of Washington* **78,** 16-37.

Nelson, J.M. 1980. Some Invertebrates from Ailsa Craig. *The Western Naturalist* **9,** 9-16.

Papp, L. 1978a. Contribution to the revision of the Palaearctic Lauxaniidae (Diptera). *Annals of the Hungarian Museum of Natural History (Budapest)* **70,** 213-231.

Papp, L. 1978b. 52 csalad: Lauxaniidae-Korhadéklegyek. *Fauna Hungariae*. **15,** 1-59.

Remm, E. and Elberg, K. 1979. Terminalia of the Lauxaniidae (Diptera) found in Estonia, Latvia and Lithuania. *Dipteroloogilisi Uurimusi* 66-117. Tartu.

Rotheray, G.E. 1993. Colour Guide to Hoverfly Larvae (Diptera, Syrphidae). *Dipterists Digest* (*First Series*) **9,** 1-155.

Rotheray, G.E. 2009. The puparium and Scottish distribution of *Pseudolyciella pallidventris* (Fallén, 1820) and allied species (Diptera, Lauxaniidae). *Dipterists Digest* (*Second Series*) **16,** 41-46.

Rotheray, G.E. and Gilbert, F. 2008. Phylogenetic relationships and the larval head of the lower Cyclorrhapha (Diptera) *Zoological Journal of the Linnean Society* **153,** 287-323.

Shatalkin, A.I. 2000. [Keys to the Palaearctic flies of the family Lauxaniidae (Diptera)]. *Zoologicheskie Issledovania* **5,** 101 pp. (in Russian, with an English summary).

Steel, W.O. and Woodroffe, G.E. 1968. The Entomology of the Isle of Rhum. *Transactions of the Society for British Entomology* **18,** 91-167.

***Atelestus pulicarius* (Fallén, 1816) (Diptera, Atelestidae) reared from woodland soil** - Having previously noted the galls caused by the larvae of *Agathomyia wankowiczii* (Schnabl) (Diptera, Platypezidae) in the fruiting bodies of the polypore *Ganoderma applanatum* (Pers), at Anglesey Abbey, Lode, (Grid Ref TL525621, V.C. 29, Cambridgeshire), I decided on 16 April 2009 to collect some soil from beneath the fungus in the hope of rearing the adults. This technique was used very successfully by Judy Webb, when she obtained *A. wankowiczii* from peat collected beneath similar galls at Spartum Fen, Oxfordshire (Webb, J.A. 2009. **In** Dipterists Day Exhibits 2008 - compiled by Editor from exhibitor's notes. *Dipterists Digest* (*Second Series*) **16**, 56.). I wasn't able to repeat Judy's success on the same scale, with only single males of *A. wankowiczii* emerging on 7 and 13 May 2009, but on 25 May 2009 a female *Atelestus pulicarius* (Fallén, 1816) emerged. Very little appears to be known about the biology of the immature stages of Atelestidae and although this record does not advance that knowledge much further, it may point to areas worthy of further investigation. The *G. applanatum* was growing on the trunk of a dead, fallen tree of unknown species, in an area of wet deciduous woodland. Other Diptera that emerged from the soil were - a female *Tipula* probably *T. lunata* Linnaeus (Tipulidae), *Meiosimyza rorida* (Fallén) (Lauxaniidae) and *Phaonia rufiventris* (Scopoli) (Muscidae) - **IVAN PERRY,** 27 Mill Road, Lode, Cambridge, CB25 9EN

Dipterists Digest 2010 **17,** 73-75

A second British locality for *Earomyia netherlandica* MacGowan, 2004 and records of other Lonchaeidae

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Summary
A second British locality for *Earomyia netherlandica* MacGowan, 2004 (Lonchaeidae) is given. The first English records of *Lonchaea caledonica* MacGowan & Rotheray, 2000 and *L. zetterstedti* Becker, 1902 (Lonchaeidae) are cited; both species were previously thought to be restricted to Scotland in this country. Records of some other Lonchaeidae are included.

Introduction

The publication of the RES Handbook to British Lonchaeidae (MacGowan and Rotheray 2008), prompted me to re-examine my collection of this neglected family of Diptera. Amongst a mixture of unidentified material and species previously determined using Collin (1953), were a number of significant records and this has been added to during 2009. By sweeping foliage at a height of 3-4 metres in sheltered woodland edge situations, I have been successful in obtaining many specimens including males, which MacGowan and Rotheray (2008) indicate are infrequent in collections.

Dasiops calvus Morge, 1959

A paratype listed by Morge (1959) was a male found by J.E. Collin in the New Forest, Hampshire; I have a female from there collected at Matley Bog (SU334073) on 18.vi.2000.

Earomyia netherlandica MacGowan, 2004

Amongst my specimens previously identified as *Earomyia viridana* (Meigen, 1826), was a male that stood out as being noticeably larger than the rest. Subsequent examination showed that it was in fact *E. netherlandica,* taken at Wicken Fen, Cambridgeshire (TL548700) on 5.v.1997. It was found in compartment 2, which at the time was a mosaic of open fen, carr and wet woodland. Since then the area has been the subject of a restoration project, which has seen all the carr and woodland removed and the introduction of grazing by Konik ponies. With the biology of *E. netherlandica* unknown, it is uncertain what effect this will have on the population at Wicken; *E. netherlandica* was added to the British List by MacGowan (2004), from a female collected by J.H. Cole at Little Paxton Pits, Huntingdonshire (TL1963) on 11.v.1993. Further material has been obtained from the same site, an additional female on 11.v.1993 and a female on 4. vi. 1993 (Jonathan Cole *pers. comm.*). As the only British records are from adjoining counties in East Anglia, it may prove to be restricted to the fenland region in this country.

Lonchaea affinis Malloch, 1920

I have single females found at various localities in Scotland, which would appear to be this species. It is very similar to *L. laxa* Collin, 1953, although that species is considered to be restricted to the South in this country (MacGowan and Rotheray 2008). *Lonchaea affinis* has been reared from coniferous trees, although two of my captures (Tulloch Moor and

Camghouran), were from birch woodland well away from conifers and the true status of both species in this country will only be solved by the capture of more males. Dall Burn, Rannoch Forest, Perthshire (NN590560), 4.vi.1998; Carie, Rannoch Forest, Perthshire (NN614565), 14.vi.2009; Foss, Perthshire (NN781561), 14.vi.2009; Camghouran, Loch Rannoch, Perthshire (NN536568), 18.vi.2009; Tulloch Moor, Inverness-shire (NH958164), 26.vi.2007.

***Lonchaea bukowskii* Czerny, 1934**
I have a female from Park Ground Inclosure, New Forest, Hampshire (SU303064), 1.vi.1980 and a male from Loch Rannoch, Camghouran, Perthshire (NN536568), 20.vi.2009. Park Ground Inclosure is a mature beech/oak plantation, whilst the habitat at Camghouran was birch woodland. MacGowan and Rotheray (2008) knew of only three British localities for this species, one of which was also Rannoch.

***Lonchaea caledonica* MacGowan & Rotheray 2000**
This species was previously known only from Scotland (MacGowan and Rotheray 2008), where it has been reared from Scots pine *Pinus sylvestris*. I found a female on a stack of pine trunks at Set Thorns Inclosure, New Forest, Hampshire (SZ268998) 26.vi.1988. Abroad this species has been recorded from The Netherlands, so its discovery in Southern England is perhaps not too surprising.

***Lonchaea caucasica* Kovalev, 1974**
I have found this species a few times in the New Forest, Hampshire, including a female on a *Cossus* oak, Ladycross (SU334030) 27.v.2004.

***Lonchaea contraria* Czerny, 1934**
I can add Suffolk to the list of counties given by MacGowan and Rotheray (2008): Kings Forest (TL810715) 18.vi.1994. In the New Forest, Hampshire at Churchplace Inclosure (SU348097) 29.v.2005, I found a male on a *Cossus* oak.

***Lonchaea hackmani* Kovalev, 1981**
I reared this species in 1987 from larvae found beneath the bark of a grey poplar *Populus canescens* at Lode, Cambridgeshire (TL528619). This is an additional county to those given by MacGowan and Rotheray (2008).

***Lonchaea laxa* Collin, 1953**
I have a female presumed to be this species (see comments under *L. affinis*) from Denny Wood, New Forest, Hampshire (SU334069) 26.v.2004.

***Lonchaea palposa* Zetterstedt, 1847**
Although I have reared many Diptera from poplar species over the years, I have never succeeded in rearing this species. It appears to very local in the Cambridge area and my only encounter with it was a female on Lombardy poplar *Populus nigra "italica"* at Fen Ditton, Cambridgeshire (TL488600) 27.vi.1987.

***Lonchaea ragnari* Hackman, 1956**
This is a boreal species restricted to Scotland in this country, where it breeds in birch *Betula* species (MacGowan and Rotheray 2008). At Dulsie Bridge, Inverness-shire (NH934416) on 25.v.1991, I found a male on a fallen aspen *Populus tremula*, although this may have been a

fortuitous occurrence, as it has not been reared from this tree, despite extensive investigations by the Malloch Society (MacGowan 1993). My other records are a female at Feshiebridge, Inverness-shire (NH851046), 28.vi.2007 and two males at Camghouran, Loch Rannoch, Perthshire (NN536568) on 20.vi.2009.

***Lonchaea scutellaris* Rondani, 1874**
I can add willow *Salix* sp. and elm *Ulmus procera* to the list of trees this species has been reared from in this country. Both occurrences were in 1977 at Lode, Cambridgeshire (TL530626).

***Lonchaea subneatosa* Kovalev, 1974**
I can add Cambridgeshire to the list of counties given by MacGowan and Rotheray (2008): two males reared from a *Populus* species at Roman Road, near Wandlebury (TL498542) in 1976, and a female was found at Coe Fen, Cambridge (TL448574), 25.vi.1979.

***Lonchaea ultima* Collin, 1953**
I can add the first Welsh record, Tir Stent, Gwynedd (SH758158), 19.vii.2007, a female. My other encounters with this species are all from mature, sometimes ancient deciduous woodland, during May: Bradfield Woods, Suffolk (TL930573), 2.v.2007, 11.v.2009; White Downs, Surrey (TQ115488), 2.v.2009; Pondhead Inclosure, New Forest, Hampshire (SU311071), 16.v.2009; Crab Wood, Hampshire (SU438290), 20.v.2009.

***Lonchaea zetterstedti* Becker, 1902**
This species, which is associated with conifers, has previously only been recorded from Scotland in this country. I reared one male and two females from beneath the bark of a fallen pine *Pinus* species at Kings Forest, Suffolk (TL810715) in 1990. It has been recorded quite widely in Europe and its discovery in Southern England is not unexpected. Other species of Diptera reared from the same material included *Medetera ambigua* (Zetterstedt), *M. pinicola* Kowarz (Dolichopodidae) and *Palloptera usta* (Meigen) (Pallopteridae).

Acknowledgements
I would like to thank Jonathan Cole for allowing me to publish details of his records.

References

Collin, J. E. 1953. A revision of the British (and notes on other) species of Lonchaeidae (Diptera). *Transactions of the Society for British Entomology* **11,** 181-207.

MacGowan, I. 1993. The Entomological value of Aspen in the Scottish Highlands. *Malloch Society Research Report* **1,** 44pp.

MacGowan, I. 2004. New Species of Palaearctic Lonchaeidae (Diptera). *Dipterists Digest (Second Series)* **11,** 25-32.

MacGowan, I. and Rotheray, G. 2008. British Lonchaeidae Diptera Cyclorrhapha, Acalyptratae. *Handbooks for the Identification of British Insects* **10,** pt. 15. 142 pp. Royal Entomological Society, London.

Morge, G. 1959. Monographie der palaearktischen Lonchaeidae (Diptera). *Beiträge zur Entomologie* **9,** 323-371.

***Fannia subatripes* d'Assis-Fonseca, 1967 (Diptera, Fanniidae) rediscovered in Scotland** - On 18 June 2009 I found a male *Fannia subatripes* d'Assis-Fonseca by the edge of Loch Rannoch, near Camghouran (NN536568, V.C. 88, Mid Perthshire). The habitat was birch woodland with Diptera concentrated by a boggy stream. Other species of *Fannia* present included - *F. atra* (Stein), *F. lepida* (Wiedemann), *F. tuberculata* (Zetterstedt) and *F. verrallii* (Stein). *Fannia subatripes* was described from material collected at Bettyhill and near Tongue, Sutherland by J.E. Collin in 1938 and from a male found by C.J. Wainwright near Keltneyburn, Perthshire in 1937 (d'Assis-Fonseca, E.C.M. 1967. ***Entomologist's monthly Magazine* 103,** 137-140). As far as I am aware this is the first record in this country since that time, although it has recently been recorded from northern Sweden and Norway (Rozkošný, R., Gregor, F. and Pont, A.C., 1997. The European Fanniidae (Diptera) *Acta Scientiarum naturalium Academicae Bohemicae, Brno* **31** (2), 80 pp), where it is said to be boreal in distribution - **IVAN PERRY,** 27 Mill Road, Lode, Cambridge, CB25 9EN

***Lispocephala fuscitibia* Ringdahl, 1944 (Diptera, Muscidae) in a Dorset mire** - *Lispocephala fuscitibia* was added to the British list from bogs of the New Forest, Hampshire by S. Falk and A.C. Pont (2006. *Dipterists Digest* (*Second Series*) **13,** 39-41). Here it was found in mire types described in the National Vegetation Classification as *Hypericum elodes – Potamogeton polygonifolius* soakway (M29) or possibly *Narthecium ossifragum – Sphagnum papillosum* valley mire (M21), which are two closely juxtaposed communities found in the wettest parts of southern valley mires (Rodwell, J.S. (Ed.) 1991. *British plant communities. 2. Mires and heaths.* Joint Nature Conservation Committee, Peterborough). I swept specimens that keyed to *Lispocephala fuscitibia* using Gregor *et al.* (Gregor, F., Rozkošný, R., Barták, M. and Vaňhara J. 2002. The Muscidae (Diptera) of Central Europe. *Folia Facultatis Scientiarum Naturalium Universitatis Masarykianae Brunensis, Biologia* **107**, 1-280). They were taken on 19 June 2006 at Stoborough Heath National Nature Reserve, Dorset (V.C. 9) at sampling points that were best described as these two NVC mire types. The details of the records are 1♂, SY936847 at M29 soakway, 2♂ 2♀, SY937853 at M21 mire and 1♂, at adjacent M29 soakway. None was recorded in an earlier visit on 2 June that year, or from Studland Heath about 9 km east of Stoborough, although samples here were taken at mire characterised by still pools rather than flowing seepage. The occurrence of this fly in the Dorset heaths is not surprising, given the similarity of climate and underlying Palaeogene sand and gravel deposits to those found in the New Forest. Other uncommon coenosiine muscids recorded at Stoborough were *Lispocephala verna* (Fabricius), *Coenosia distinguens* Collin and *C. vibrissata* Collin. I thank Steven Falk for confirming my identification of *L. fuscitibia*. The survey was part of the development work for Natural England's ISIS invertebrate monitoring system (Webb, J.R. and Lott, D.A. 2006. The development of ISIS: a habitat-based invertebrate assemblage classification system for assessing conservation interest in England. *Journal of Insect Conservation* **10**, 179-188) - **C. MARTIN DRAKE,** Orchid House, Burridge, Axminster, Devon EX13 7DF

Dipterists Digest 2010 **17**, 77-78

Linnaemya picta (Meigen, 1824) (Diptera, Tachinidae) new to Britain

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Summary

Linnaemya picta (Meigen, 1824) is newly recorded from Britain on the basis of specimens taken in Kent. Previous misidentifications of *L. picta* as *L. rossica* (Zimin, 1954) are corrected.

Introduction

On 19 August 2009 HB visited Denge Wood in Kent. The day was sunny and warm, and in a large woodland clearing (TR106522) an area of wild parsnip (*Pastinaca sativa*), fringed with bracken (*Pteridium aquilinum*), was busy with hoverflies and large numbers of the common tachinid *Tachina fera* (Linnaeus, 1761). At rest on a bracken frond was a tachinid that HB did not recognize; using the keys in Belshaw (1993) he identified it as a male *Linnaemya rossica* (Zimin, 1954). Belshaw notes that this species is "usually found in cool montane areas with pine forests", a description which is very far from fitting Denge Wood, and gives its British distribution as Northern England, Northern Scotland and Woolwich Wood in Kent. The four records from this last location all date from the 1950s and were taken by E.C.M. d'Assis-Fonseca.

HB sent the specimen to CR for confirmation of its identity. CR agreed that Belshaw led unambiguously to *L. rossica*, but because it was taken in a place so different from its usual habitat he decided to investigate further. Theo Zeegers (*pers. comm.*) suggested checking it against the keys in Tschorsnig and Herting (1994), where it ran to *L. picta* (Meigen, 1824), more likely in this habitat, though previously unrecorded from Britain. Nigel Wyatt kindly checked the Woolwich Wood specimens in the Natural History Museum collection. He confirmed them to be *L. picta*, so it seems that this species was taken in Kent in the 1950s, but misidentified at the time. Tschorsnig and Herting (*op. cit.*) noted that *L. picta* is often very frequent in the warmer parts of Central Europe, but rare further north, though it does occur as far north as St. Petersburg. In the light of this it is perhaps surprising that no British records exist between 1956 and 2009.

Subsequently a female of *L. picta* was taken by M.N. Smith on hogweed (*Heracleum sphondylium*) flowers, next to the River Stour near Hothfield, Kent (TQ959459) on 23 September 2009.

The hosts of *Linnaemya picta* are listed as *Agrotis* sp., *Xestia c-nigrum* (Linnaeus, 1758), *Anaplectoides prasina* (Denis & Schiffermüller, 1775) and *Mamestra brassicae* (Linnaeus, 1758) (Noctuidae) by Tschorsnig and Herting (1994).

Identification

The following modifications to the keys in Belshaw (1993) accommodate the additional species. On page 49 replace the *Linnaemya* couplet 3 with:

3. Gena with only fine hairs (at least some of the lower ones also fair) - distinct from the single line of bristles extending down from the vibrissa (Fig. 223). Costal cell of the wing (Fig. 225) with only approximately half its area covered in the microscopic hairs that are present over most of the wing membrane. Sternite 1 with pale hairs ..... ***tessellans*** (Robineau-Desvoidy)

- Gena with larger black hairs/small bristles - some of which are at least half the thickness of the bristles below the vibrissa (Fig. 224). Costal cell with a uniform covering of microscopic hairs. Sternite 1 with black hairs 4

4. Posterodorsal part of the head, behind the post-ocular row, with 2-8 bristles, in addition to small black hairs mixed with the white hairs. Tibiae black or dark brown. Postpronotum entirely black. Male syncercus not bent apically ..... ***rossica*** (Zimin)

- Posterodorsal part of the head, behind the post-ocular row, with just a scattering of fine black hairs restricted to the middle third of the head when viewed from above, mixed with the white hairs. Tibiae yellow. Postpronotum usually yellowish or reddish at least near the outermost postpronotal bristle. Apex of male syncercus bent in lateral view ..... ***picta*** (Meigen)

Acknowledgements

Thanks are due to Nigel Wyatt for his determination of earlier specimens, and for reviewing and suggesting improvements to this manuscript; to Theo Zeegers for his initial advice regarding the genus *Linnaemya* and to Hans-Peter Tschorsnig for revising the keys.

References

Belshaw, R. 1993. *Tachinid Flies*. Handbooks for the Identification of British Insects Vol. 10, Part 4a(i). Royal Entomological Society, London.

Tschorsnig, H.-P. and Herting, B. 1994. *Die Raupenfliegen (Diptera: Tachinidae) Mitteleuropas*: Bestimmungstabellen und Angaben zur Verbreitung und Ökologie der einzelnen Arten. *Stuttgarter Beiträge zur Naturkunde* (A) **506,** pp.1-170.

Dipterists Digest 2010 **17**, 79-82

Additions and changes to the British List of Anthomyiidae (Diptera)

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Summary
Recent additions and nomenclatural changes to the British list of Anthomyiidae are reported. *Delia penicilliventris* nom. n. is proposed as a new name for *Aricia criniventris* Zetterstedt, 1860, preocc. (= *Delia penicillaris*: authors, misident., not Rondani, 1866).

Introduction

Recent research on European Anthomyiidae has resulted in three species being added to the British List (*Botanophila discreta* (Meigen), *Pegomya atricauda* Ringdahl and *P. macrophthalma* Griffiths). A further eight species are the subject of changes resulting in the following currrent names (*Alliopsis longiceps* (Ringdahl), *Botanophila estonica* (Elberg), *B. rupicapra* (Mik), *Delia lophota* (Pandellé), *D. penicilliventris* Ackland, *Paradelia hedgreni* (Ringdahl), *Pegomya vanduzeei* (Malloch) and *Pegoplata annulata* (Pandellé).

Species accounts

Alliopsis longiceps (Ringdahl, 1935)

Alliopsis sitiens (Collin, 1943) [*Prosalpia*]

The earliest name for this species is *Hylemyia longiceps* Ringdahl, 1935 (Michelsen 2010).

Botanophila discreta (Meigen, 1826)

Botanophila striolata: authors, misident. in part, not Fallén, 1824

This name was removed from the synonymy of *B. striolata* (Fallén) by Michelsen (2009) and considered a distinct species. Both species occur in Britain.

Botanophila varicolor Meigen species group

The correct nomenclature of three British species of this group is according to Michelsen (2010):

Botanophila estonica (Elberg, 1970)
= *B. varicolor*: authors, misident., not Meigen, 1826
Botanophila varicolor (Meigen, 1826)
= *B. odontogaster* (Zetterstedt, 1845)
Botanophila trapezina (Zetterstedt, 1845)

Botanophila rupicapra (Mik, 1887)

Botanophila flavisquama (Stein, 1906) [*Pegomyia*]
Botanophila alligata (Huckett, 1965) [*Hylemya* (*Botanophila*)]
Botanophila gnavula (Hennig, 1970) [*Pegohylemyia*]

According to Michelsen (2009) *Chortophila* ***rupicapra*** Mik, 1887 is the earliest name for *Botanophila flavisquama* (Stein, 1906) of the British list.

Delia lophota (Pandellé, 1900)

Delia nuda (Strobl, 1901) [*Hylemyia*]

Delia nuda (Strobl, 1901) becomes a junior synonym of *D. lophota* as a result of the dating of the original description being corrected from 1899 to 1901 (Michelsen 2010).

Delia penicilliventris nom. n.

Aricia criniventris Zetterstedt, 1860, *Diptera Scandinaviae* **24,** 6244
Delia penicillaris: authors, misident., not Rondani, 1866

The species currently included in the British List as *Delia penicillaris* Rondani, 1866 requires a new name. Zetterstedt in 1860 described two species from Sweden with the same specific name:

Anthomyza criniventris Zetterstedt, 1860, *Diptera Scandinaviae* **24**: 6268. Holotype male, Sweden: Skåne, Fågelsång, 7.viii.1855 (Sunderwall). This species has yellow tibiae and is on the British List as *Delia criniventris* (Zetterstedt).

Aricia criniventris Zetterstedt, 1860, *Diptera Scandinaviae* **24**: 6244. Lectotype male, Sweden: Uppland, Stockholm (Boheman). This species has black tibiae.

The name *Aricia criniventris* Zetterstedt, 1860 is preoccupied in *Delia* Robineau-Desvoidy because priority has been designated to *Anthomyza criniventris* Zetterstedt, 1860 (Hennig, 1974a: 820). See Michelsen (1985) for details.

As pointed out by Michelsen (1985: 44) Hennig incorrectly placed *Aricia criniventris* in synonymy with *Delia floricola* Robineau-Desvoidy, a species not recorded from Scandinavia, and which has different sternal chaetotaxy in the male.

Michelsen (*loc. cit.*) identified *Aricia criniventris* as *Delia penicillaris* (Rondani, 1866), described from Italy. This species has not so far been recorded from either Scandinavia or Britain. It has different surstyli (Hennig, 1974b, fig. 1146 lectotype), with the distal part in caudal view constricted; compare with Fig. 1145 of "*penicilaris*" (sic) from northern Russia, which is of the surstyli of *D. penicilliventris*.

It follows that the Scandinavian species (which also occurs rather rarely in northern Britain and also across the northern Palaearctic Region) requires a new name. I therefore propose the replacement name ***Delia penicilliventris*** for *Aricia criniventris* Zetterstedt, 1860.

Paradelia hedgreni (Ringdahl, 1959)

Paradelia palliceps: authors, misident., not Zetterstedt, 1845

The Palaearctic species of *Paradelia* were revised by Michelsen (2007). The species previously recorded from Britain as *Paradelia palliceps* (Zetterstedt, 1845) (with synonym *P. setinerva* (Ringdahl)) proved to be *Paradelia hedgreni* (Ringdahl, 1959). The true *P. palliceps* has not been recorded from Britain.

***Pegomya maculata* Stein, 1906**

The *Pegomya maculata* species group in Europe was revised by Michelsen and Ackland (2009). As a result the number of species was raised from two to four. Three of these species occur in Britain. They are *P. maculata* Stein, *P. atricauda* Ringdahl and *P. macrophthalma* Griffiths, 1984, the latter two species being new to Britain. A fourth species, *Pegomya grahami* Michelsen & Ackland, 2009 occurs in Europe and Canada (where it was misidentified as *P. maculata* by Griffiths), but has not so far been found in Britain. The four species in this group are primarily identified by small differences in the male genitalia; the female has so far been recognised only for *P. maculata*. The adults of all four species are rarely collected; the larval hosts of *P. maculata* are a wide range of gilled mushrooms of the families Cortinariaceae, Lactariaceae, Marasmiaceae and Tricholomataceae.

***Pegomya vanduzeei* (Malloch, 1919).**

Pegomya versicolor authors, misident., not Meigen, 1826

Michelsen (2010) studied the type of *P. versicolor* (Meigen, 1826), which proved to be *P. solennis* (Meigen). The next available name is *P. vanduzeei* (Malloch, 1919).

***Pegoplata annulata* (Pandellé, 1899).**

Pegoplata juvenilis subsp. *nitidicauda* (Schnabl in Schnabl & Dziedzicki, 1911) [*Pegomyia*]

Griffiths (1986: 622) considered the Palaearctic species *P. nitidicauda* (Schnabl, 1911), which has dark legs, and the Nearctic species *P. juvenilis* (Stein, 1898), which has yellow legs, to be conspecific. As the Nearctic name had priority, the Palaearctic species became known as *P. juvenilis nitidicauda*. Michelsen (2010) identified *P. annulata* (Pandellé, 1899) as a senior synonym of *P. nitidicauda*, and also concluded that it was not conspecific with *P. juvenilis* and should be treated as a distinct species with the name *Pegoplata annulata* (Pandellé, 1899).

References

Griffiths, G.C.D. 1984. Anthomyiidae [part]. **In** Griffiths, G.C.D. (Ed.) *Flies of the Nearctic Region* 8(2) 3, 289-408.

Griffiths, G.C.D. 1986. Anthomyiidae [part]. **In** Griffiths, G.C.D. (Ed.) *Flies of the Nearctic Region* 8(2) **5,** 601-728.

Hennig, W. 1974a. Anthomyiidae [part]. **In** Lindner, E. (Ed.) *Die Fliegen der palaearktischen Region* 7(1), Lief. **307,** 777-872. E. Schweizerbart, Stuttgart.

Hennig, W. 1974b. Anthomyiidae [part]. **In** Lindner, E. (Ed.) *Die Fliegen der palaearktischen Region* 7(1), Lief. **308,** 873-920. E. Schweizerbart, Stuttgart.

Michelsen, V. 1985. A revision of the Anthomyiidae (Diptera) described by J. W. Zetterstedt. *Steenstrupia* **11**(2), 37-65.
Michelsen, V. 2007. Taxonomic review of Eurasian *Paradelia* Ringdahl (Diptera: Anthomyiidae) with descriptions of two new species. *Zootaxa* **1592,** 1-44.
Michelsen, V. 2010. Fauna Europaea: Anthomyiidae. **In** Pape, T. (Ed.), Diptera Brachycera. Europaea version 2.2. http://www.faunaeur.org.
Michelsen, V. and Ackland, D.M. 2009. The *Pegomya maculata* species group (Diptera Anthomyiidae) in Europe, with description of a new species. *Zootaxa* **2315,** 51-65.

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Dipterists Digest Volume 17, No. 1 2010

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Published by

Dipterists Forum

ISSN 0953-7260

Printed and bound in the United Kingdom by Henry Ling Limited at the Dorset Press, Dorchester, DT1 1HD