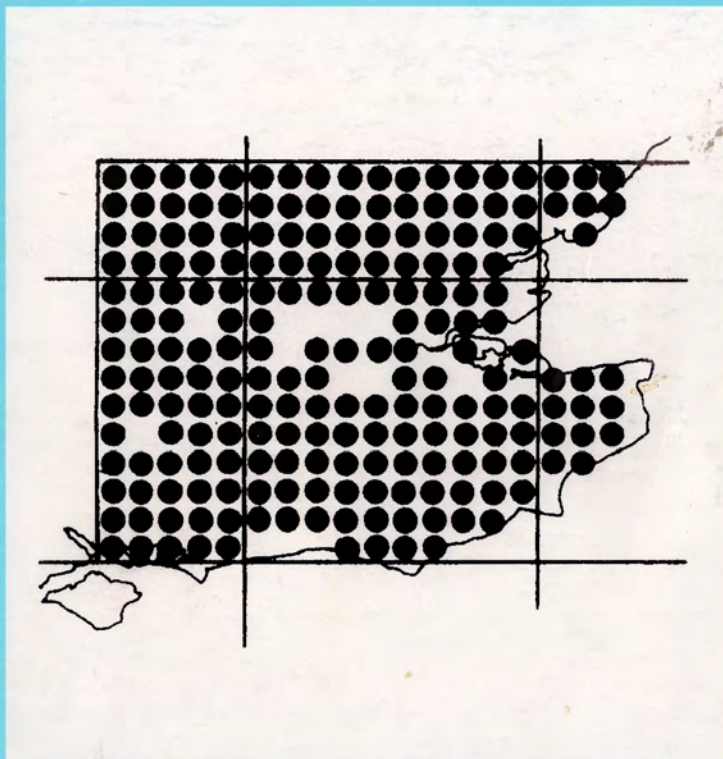
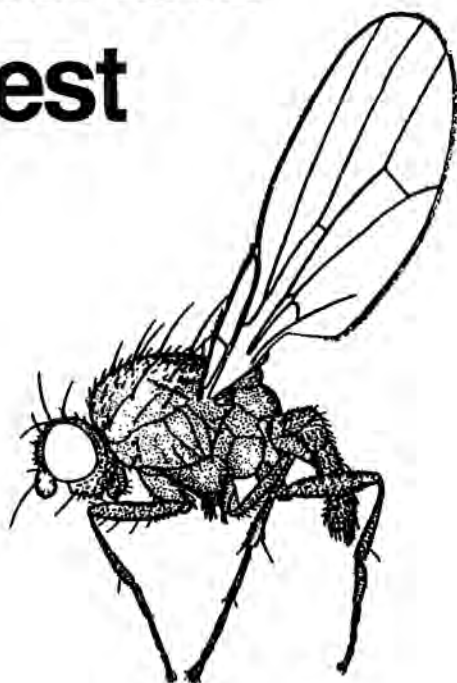


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Dipterists Digest is the journal of the **Dipterists Forum**. It is intended for amateur, semi-professional and professional field dipterists with interests in British and NW European flies. All notes and papers submitted to **Dipterists Digest** are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

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

Articles may be of any length up to 3,000 words and must not have been accepted for publication elsewhere. Items exceeding this length may be serialised or printed in full, depending on competition for space. Articles should be written in clear and concise English and should preferably be typed double spaced on one side of A4 paper. **After acceptance all contributions should, wherever possible, also be supplied on 3.5" computer disc** in ASCII, Word or Word Perfect formats and accompanied by hard copy. (E-mail attachments are acceptable).

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 and should be supplied with the article. References to journals should give the title of the journal in full. Scientific names should be underlined or, preferably, italicised. **If an article is to be supplied on disc, scientific names should always be italicised.** Authors of scientific names should be given in full (with parentheses if applicable) and nomenclature should follow the most recent check list, unless reflecting subsequent changes. Tables should be on separate sheets. Figures should be drawn in clear black ink, about 1.5 times their printed size and lettered clearly. 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.

Articles and notes for publication should be sent to the Editor at the address given above. Enquiries about subscriptions and information about the **Dipterists Forum** should be addressed to the Membership Secretary, Liz Howe, Ger-y-Parc, Marianglas, Tynyngogl, Benllech, Gwynedd LL74 8NS, UK.

Scarcer Diptera found in the Bristol Region in 1999, 2000 and 2001

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Summary

Records from Somerset or Gloucestershire are presented for forty-eight species in the following families: Cylindrotomidae, Limoniidae, Ditiomyiidae, Keroplatidae, Mycetophilidae, Dixidae, Rhagionidae, Stratiomyidae, Tabanidae, Acroceridae, Bombyliidae, Asilidae, Hybotidae, Dolichopodidae, Lonchopteridae, Platypetidae, Syrphidae, Pipunculidae, Micropezidae, Lonchaeidae, Conopidae, Ulidiidae, Tephritidae, Lauxaniidae, Chamaemyiidae, Sciomyzidae, Clusiidae, Heleomyzidae, Drosophilidae, Chloropidae, Ephydriidae, Scathophagidae, Muscidae, Fanniidae, Calliphoridae, Tachinidae. Comments are made on their past and present status in this district.

Introduction

Little seems to have been published on the Diptera of the Bristol Region since Audcent's annotated lists published in the Proceedings of the Bristol Naturalists Society in 1948 and 1950. Here I discuss those scarcer species likely to be of more than local interest, found during my fieldwork from 1999 to 2001. Some of these species were also recorded during dipterists' field meetings based at Charterhouse-in-Mendip in 1985 and 1986; relevant records from these meetings are cited where known but the results of these meetings have not been collated.

Diogma glabrata (Meigen, 1818) (Cylindrotomidae)

This rather pale crane fly was recorded from three sites close to Bristol by Audcent (1948) but this appears to be the first record in the region since 1929. A single individual was swept from understorey vegetation at Monk Woods ST 7570 on 24 July 1999.

Erioptera mejerei Edwards, 1921 (Limoniidae)

This small yellow crane fly was not recorded by Audcent (1948) and this would appear to be the first record for Gloucestershire and the Bristol region. A single male was swept from sedges at Lawrence Weston Moor ST 5479 on 30 July 1999.

Pilaria fuscipennis (Meigen, 1818) (Limoniidae)

This slender yellowish crane fly was described as rare by Audcent (1948) with just one record from St Audries, Somerset; there are no records for Gloucestershire (Alexander 1999). A single male was found at Monk Woods ST 7570 on 24 July 1999.

Atypophthalmus inustus (Meigen, 1818) (Limoniidae)

There are no published records of this crane fly for Somerset (Audcent 1948) and it is unrecorded in Gloucestershire (Alexander 1999), so it appears to be very rare in the region. Found in Folly Wood ST 6060 on 25 July 2001.

Helius pallirostris Edwards, 1921 (Limoniidae)

This crane fly is unrecorded in Gloucestershire (Alexander 1999) but there are records from Shapwick (1927) and Backwell (1928) in Somerset (Audcent 1948). One was found at Clapton Moor on 2 September 2000.

Limonia trivittata (Schummel, 1829) (Limoniidae)

This small yellowish crane fly is known from two records each in Gloucestershire and Somerset

(Audcent 1948, Alexander 1999). Individuals were found in Monk Woods ST 7570 on 24 July 1999 and 20 July 2000.

Ormosia bicornis (de Meijere, 1920) (Limoniidae)

This small crane fly is known from an old Gloucestershire record (Alexander 1999) but there are none from Somerset. It was frequent in Dowlings Wood ST 6060 on 12 September 2000 and nearby at Folly Wood ST 6060 on 28 September 2001.

Ditomyia fasciata (Meigen, 1818) (Ditomyiidae)

This fungus gnat is known from a single record in Gloucestershire (Alexander 1999) but Audcent (1948) did not list it. It was found at Brown's Folly on 24 August and 25 September 2000 and Monk Woods on 22 September 2000.

Keroplatus testaceus Dalman, 1818 (Keroplatidae)

This most distinctive of fungus gnats is recorded from three sites in Gloucestershire (Alexander 1999) and four in Somerset (Audcent 1948, Chandler 1993). It was taken at Cleve Heronry ST 4666 on 11 September 2000 and Dowlings Wood ST 6060 on 12 September 2000.

Macrocera longibrachiata Landrock, 1917 (Keroplatidae)

This distinctive species was previously known as British from a single male collected at Clovelly, North Devon in 1927 (Edwards 1927). One male was taken in calcareous woodland at Weston Big Wood ST 4574 on 1 September 2001.

Macrocera pusilla Meigen, 1830 (Keroplatidae)

Locally this species has only been recorded at West Town in 1928 (Audcent 1948). A single male was taken in Dowlings Wood ST 6060 on 12 September 2000.

Boletina nitida Grzegorzek, 1885 (Mycetophilidae)

This species is recorded from a single site in Gloucestershire (Alexander 1999); Audcent (1948) gave only an old record from Leigh Woods, Somerset but it was recorded at two sites in October 1986, Rodney Stoke and Ivy Thorn Hill (Peter Chandler *pers. comm.*) It was found again at Ivy Thorn Hill ST 4734 on 20 June 2001 and at Brown's Folly ST 7965 on 29 June 2000.

Mycomya flavicollis Zetterstedt, 1852 (Mycetophilidae)

Locally this fungus gnat seems to be relatively frequent in the Cotswolds (Alexander 1999) but Audcent (1948) did not list it for Somerset. A single male was found at Brown's Folly ST 7965 on 25 September 2000.

Mycomya occultans (Winnertz, 1863) (Mycetophilidae)

This fungus gnat has not previously been recorded in the region (Chandler *pers. comm.*) but is probably well distributed. It was recorded from Brown's Folly ST 7965 on 29 June 2000, Monk Woods ST 7570 on 22 September 2000 and Weston Big Wood ST 4574 on 1 September 2001.

Neoempheria bimaculata (von Roser, 1840) (Mycetophilidae)

This fungus gnat has no previous Somerset or Gloucestershire records (Chandler *pers. comm.*). A single male was found at Monk Woods ST 7570 (V.C. 6) on 22 September 2000.

Megophthalmidia crassicornis (Curtis, 1837) (Mycetophilidae)

Locally this fungus gnat was recorded from Clevedon in 1940 (Audcent 1948) and there are unpublished records from Wells, July 1902 (C.G. Lamb, Cambridge University Museum

collection) and Brompton Ralph, 8 July 1973 (C.H. Andrewes, Natural History Museum, London). It was taken at Dowlings Wood ST 6060 on 12 September 2000.

Exechiopsis dimitrescae (Burghel-Balacesco, 1972) (Mycetophilidae)

Previously this fungus gnat has been recorded from Midger Wood in Gloucestershire (Alexander 1999) and at four sites in Somerset in 1986 (Withial Combe, Cogley Wood, Edford Wood and Ebbor Gorge; Peter Chandler *pers. comm.*). Males were found at Dowlings Wood ST 6060 on 12 September 2000 and Brown's Folly ST 7965 on 25 September 2000.

Exechiopsis membranacea (Lundström, 1912) (Mycetophilidae)

This was known in Somerset from Edford Wood, where it was found on 18 October 1986 (Peter Chandler *pers. comm.*). One male was taken in Folly Wood ST 6060 on 25 July 2001.

Rymosia signatipes (van der Wulp, 1859) (Mycetophilidae)

In Somerset this fungus gnat is recorded from a few sites including Cogley and Cheddar Woods (Chandler *pers. comm.*). One was swept in Weston Big Wood ST 4574 on 1 September 2001.

Mycetophila autumnalis Lundström, 1909 (Mycetophilidae)

There are no previous records from Somerset of this fungus gnat but it is likely to be under recorded (Chandler *pers. comm.*). A single male was found at Monk Woods ST 7570 (V.C. 6) on 22 September 2000.

Mycetophila eppingensis Chandler, 2001 (Mycetophilidae)

This recently described fungus gnat is unrecorded in the region. Males were found at Dowlings Wood ST 6060 on 12 September 2000 and Monk Woods ST 7570 (V.C. 6) on 22 September 2000.

Dixa maculata Meigen, 1818 (Dixidae)

In the region this meniscus midge is known from three Somerset records, a single undated record from Cheddar (Audcent 1948) and in October 1986 it was recorded by Alan Stubbs at Cogley Wood and Withial Combe (Peter Chandler *pers. comm.*). A single male was taken at Monk Woods ST 7570 on 20 July 2000.

Symphoromyia immaculata (Meigen, 1804) (Rhagionidae)

Locally, this small silvery-grey snipe fly was first recorded at Charterhouse in 1923 (Audcent 1948) and all subsequent Somerset records are also from the Mendips (Drake 1991); there are no records from Gloucestershire (Alexander 1999). A single female was swept from long grass at Ashton Court Meadow ST 5472 on 7 July 1999; it was also frequent in tall *Brachypodium* grassland at Wavering Down ST 4055 on 15 July 2001.

Haematopota grandis Meigen, 1820 (Tabanidae)

One of the "clegs", this horsefly was previously known from two records adjacent to the Severn in Gloucestershire, the latest at Severnside in 1997 (Alexander 1999). A single female was found at Littleton Brick Pit ST 5991 on 4 August 2000.

Iberis clavipes (Linnaeus, 1767) (Stratiomyidae)

This species was quite frequent in Audcent's time with eight localities listed (Audcent 1948), nearly all in Somerset. It now seems to be much scarcer but still occurs. One was obtained from a Carex-rich ditch at Pawlett Levels ST 3143 on 4 June 1999, another in scrub at Sand Point ST 4265 on 18 May 2001.

Beris fuscipes Meigen, 1820 (Stratiomyidae)

Locally this species is known from an old record near Bristol (Drake 1991). One male was beaten from overhanging foliage at Slader's Leigh ST 4256 on 11 July 2001.

Neopachygaster meromelas (Dufour, 1841) (Stratiomyidae)

This small black soldierfly was not recorded by Audcent (1948) and I know of no subsequent records for the Bristol region. A single individual was found hovering near a dead elm (*Ulmus*) tree at Radstock Sidings ST 6954 on 16 June 1999 and one found at Slader's Leigh ST 4256 on 11 July 2001.

Vanoyia tenuicornis (Macquart, 1837) (Stratiomyidae)

This small black and yellow soldierfly was unrecorded by Audcent (1948); subsequently there has been one record from Gloucestershire (Alexander 1999) and four from Somerset (Drake 1991; A. Foster *pers. comm.*). A few individuals were swept from wet grassland at Max Bog ST 4057 on 25 June 1999.

Odontomyia ornata (Meigen, 1822) (Stratiomyidae)

The Somerset Levels is now the most important stronghold for this distinctive soldierfly, with most records south of the Mendips (Drake 1991). Adults were found at Pawlett Levels ST 3143 on 16 June 2000 and larvae were found at Clapton Moor ST 4573 on 4 September 2000.

Oxycera morrisii Curtis, 1833 (Stratiomyidae)

This black and white soldierfly was recorded at Edington, Somerset in 1947 and 1948 (Audcent 1948) and more recently from two sites in Gloucestershire (Alexander 1999) and Prior Park in Somerset (A. Foster *pers. comm.*). Two were swept from vegetation along a ditch at Max Bog ST 40 57 on 25 June 1999.

Oxycera pardalina Meigen, 1822 (Stratiomyidae)

Audcent (1948) only listed this very elusive, black and white soldierfly from two sites but recently it has been found more frequently in the Bristol region. Gloucestershire seems to be a stronghold for the species with six known sites, most of them recent (Alexander 1999); there are also recent records from Somerset (Drake 1991; A. Foster *pers. comm.*). A single female was swept from vegetation beside springs in Monk Woods ST 7570 on 24 July 1999; it was also found at Slader's Leigh ST 4256 on 11 July 2001 and taken from a woodland stream in Folly Wood ST 6060 on 25 July 2001.

Oxycera pygmaea (Fallén, 1817) (Stratiomyidae)

This tiny soldierfly was not listed by Audcent (1948), but there are two records for Gloucestershire (Alexander 1999). Two were swept from vegetation near seepages at Max Bog ST 4057 on 25 June 1999 and 26 June 2000. This would appear to be the first record for Somerset.

Ogcodes gibbosus (Linnaeus, 1758) (Acroceridae)

This hunch-backed fly only appears to have been recorded previously in the region once, also close to the Poldens (Drake 1991). Singletons were found in tall grassland at Ivy Thorn Hill ST 4734 on 20 June and 26 July 2001.

Bombylius canescens Mikan, 1796 (Bombyliidae)

This bee-fly was always uncommon and has declined dramatically in Gloucestershire, where it is now probably extinct (Alexander 1999); in Somerset it now appears to be confined to the

Mendips. There is a strong population at Dolebury Warren ST 4558, where one female was seen on 5 June; three including one female ovipositing and nectaring were observed on thyme (*Thymus polytrichus*) on 11 June 1999. It was also recorded at Tickenham Hill ST 4472 on 30 May and 26 June 2001; the first Somerset records away from the Mendips since 1942 (Audcent 1948).

Bombylius discolor Mikan, 1796 (Bombyliidae)

Considerable efforts were made to find this bee-fly in 1999; in Audcent's time it was considered to be fairly common but records have been sparse recently. Good breeding colonies were found at Troopers Hill ST 6273 on 6 April; Uphill ST 3157 on 7 April; Hellenge Hill ST 3457 on 18 April and Cadbury Castle ST 6224 on 10 May 1999; singletons were seen at Moorlinch ST 3936 and Walton Hill ST 4634 on 3 May 1999. Subsequent additional records are from Cheddar Gorge ST 4854 on 10 April 2000 and Collard Hill ST 4834 on 4 May 2001.

Villa cingulata (Meigen, 1804) (Bombyliidae)

This bee-fly till recently had not been seen in Britain since 1938 and was presumed extinct (Stubbs 1997). There are no historical records from either Gloucestershire or Somerset. Three females were noted at Tucking Mill ST 7661 on 19 July 2000; about five individuals of both sexes were seen in 2001.

Asilus crabroniformis Linnaeus, 1758 (Asilidae)

This large spectacular robberfly was considered "not uncommon" in Audcent's time but clearly commoner in Somerset than in Gloucestershire (Audcent 1948). Now it is virtually extinct in Gloucestershire, but still locally frequent in Somerset. A single female observed ovipositing around horse dung at Monk Woods ST 7571 on 1 September 1999 is the first recent Gloucestershire record. A large population was found to be centred on Weston Moor, in the Gordano Valley, ST 4473 on 23 August 1999, seeming to extend as far as the coast at Charcombe Bay; it was also observed at Clapton Moor ST 4573 on 30 August 2000 and Purn Hill ST 3357 on 21 August 2001.

Platypalpus excisus (Becker, 1907) (Hybotidae)

This species has been recognised as specifically distinct and occurring in this country relatively recently, previously confused with the common *P. nigratarsis* (Fallén). There do not appear to be previously published records for Somerset. A single male was found on Brean Down ST 2958 on 19 April 2000.

Platypalpus mikii (Becker, 1890) (Hybotidae)

This species has been recorded locally from Somerset (Falk and Crossley in preparation). It was taken at Dowlings Wood ST 6060 on 3 July 2000 and Brown's Folly ST 7965 on 29 June 2000.

Achalcus britannicus Pollet, 1997 (Dolichopodidae)

This tiny yellowish brown fly is probably the most frequent of the newly described *Achalcus*, but I know of no previous records from Gloucestershire or Somerset. A single male was found in a dip-net sample at Weston Moor ST 4473 on 2 August 1999.

Hercostomus plagiatus (Loew, 1857) (Dolichopodidae)

This metallic green fly was not listed by Audcent (1948) and there are still no records from Gloucestershire (Alexander 1999), but in Somerset it is now known from Berrow (Assis-sonseca 1978). This species proved to be frequent at Max Bog ST 4057 on 25 June and 27 July 1999 and 26 June 2000.

Orthoceratium lacustre (Scopoli, 1763) (Dolichopodidae)

The status locally of this shiny green fly is unknown but it is likely to be very uncommon; it has been recorded in Somerset (Assis-Fonseca 1978). A single female was swept in calcareous woodland at Purn Hill ST 3357 on 21 August 2001. Nearly all records are from the coast so this individual may be a stray.

Medetera hispinosa Negrobov, 1967 (Dolichopodidae)

This dull metallic fly was not known by Audcent but records of *M. nitida* (Macquart, 1838) from Edington (Audcent 1948), Blaise Castle (Alexander 1999) and Leigh Woods (Assis-Fonseca 1978) are probably referable to *hispinosa*. There is one confirmed record for Gloucestershire (Alexander 1999). Several were seen on a dead elm at Stockwood Open Space ST 6269 on 14 June 1999.

Neurigona suturalis (Fallén, 1823) (Dolichopodidae)

This slender fly seems to have been quite frequent, especially in Gloucestershire, in Audcent's time with eight localities listed (Audcent 1948), but I know of no subsequent records. One male came to MV light at Tytherington Common ST 6788 on 24 June 1999 and one was taken in broadleaved calcareous woodland at Tickenham Hill ST 4472 on 26 June 2001.

Systemus scholtzii (Loew, 1850) (Dolichopodidae)

This small, metallic green, species was not listed by Audcent (1948) or by Alexander (1999) but both counties are cited by Falk and Crossley (in preparation), who list 12 counties in southern England for it. A single female was pooted from a fallen, but still living, maple tree *Acer campestre* at Cleeve Heronry ST 4666 on 15 August 1999.

Sympyenus spiculatus Gerstäcker, 1864 (Dolichopodidae)

This fly is unrecorded in Gloucestershire (Alexander 1999), but in Somerset there is a record from West Town (Audcent 1948). It was found at Brown's Folly ST 7965 on 29 June 2000 and Monk Woods ST 7570 (V.C. 6) and ST 7571 (V.C. 34) on 20 July 2000.

Lonchoptera scutellata Stein, 1890 (Lonchopteridae)

This tiny yellowish fly was not recorded by Audcent (1948) and I know of no recent records. One was taken at Rendcomb Park SP 0109 on 16 October 1999.

Agathomyia cinerea (Zetterstedt, 1852) (Platypezidae)

This small flat-footed fly has no previous records from the region. Two females were swept from the vicinity of a large fallen branch at Cleeve Heronry SY 4666 on 4 October 2000.

Brachypalpus laphriformis (Fallén, 1816) (Syrphidae)

Another hive-bee mimicking hoverfly, this was only recorded from three sites by Audcent (1950); Levy and Levy (1998) added three more for Somerset so it is still rare in the county. One male was taken from hawthorn (*Crataegus*) blossom at Goblin Combe ST 4765 on 16 May 1999, a female was taken from a hogweed (*Heracleum*) flower at Radstock Sidings ST 6954 on 16 June 1999 and one was seen in Cheddar Gorge ST 4754 on 31 May 2000.

Cheilosia soror (Zetterstedt, 1843) (Syrphidae)

This all black hoverfly appears to have been overlooked by earlier collectors as it is now known to be frequent in Somerset, especially on calcareous soils (Levy and Levy 1998). It was recorded in the Avon Gorge ST 5674 on 18 July 2000, at Slader's Leigh ST 4256 on 11 July 2001 and from Weston Big Wood ST 4574 on 12 July 2001.

Chrysotoxum elegans Loew, 1841 (Syrphidae)

This very striking black and yellow hoverfly has always been uncommon, especially in Gloucestershire; it has declined and is now rare and perhaps confined to the Mendips (Levy and Levy 1998). It was recorded from Dolebury Warren ST 4558 on 4 July 1999, Cheddar Gorge ST 4754 on 22 July 2000 and 19 July 2001 and at Slader's Leigh ST 4256 on 11 July 2001.

Criorhina asilica (Fallén, 1816) (Syrphidae)

This hairy hive-bee mimicking hoverfly was not too uncommon in the past with eight localities listed by Audcent (1950) and there is no evidence that its status has changed with five subsequent records for Somerset (Levy and Levy 1998). One male was taken from hawthorn (*Crataegus*) blossom at Goblin Combe, ST 4765 on 16 May 1999.

Criorhina ranunculi (Panzer, 1804) (Syrphidae)

This large, hairy early spring hoverfly was described as uncommon by Audcent (1950), but in the Bristol region it is now best described as local. It seems likely that the very early flight season of this species has resulted in it being under-recorded; it may not in reality merit Nationally Scarce status. It was noted at Lower Woods ST 7486 on 23 March 1999, Prior's Wood ST 4974 on 2 April 1999, Bourton Combe ST 5068 on 9 April 1999, Folly Farm ST 6 60 on 10 April 1999 and Coombe Dingle ST 5578 on 15 April 1999.

Eumerus ornatus Meigen, 1822 (Syrphidae)

This hoverfly is widespread in Somerset and Gloucestershire, although still very local (Audcent 1950; Levy and Levy 1998). A single female was taken in the Avon Gorge ST 5674 on 8 June 2000.

Mallota cimbiciformis (Fallén, 1817) (Syrphidae)

This hive-bee mimicking hoverfly has always been rare in the Bristol region, with just three old records (Audcent 1950) and four subsequent records, the most recent in 1961 at Ashton Court (Levy and Levy 1998). A single male was found at Ashton Court ST 5572 on 20 June 1999.

Orthonevra brevicornis (Loew, 1843) (Syrphidae)

This small bluish black hoverfly was not listed by Audcent (1950); more recently there have been a few records (Levy and Levy 1998). It was fairly frequent at Lawrence Weston Moor ST 5479 on 20 May 1999; several individuals were also seen resting on rocks in a small stream at Folly Farm ST 6160 on 22 May 1999.

Pipizella virens (Fabricius, 1805) (Syrphidae)

This small black hoverfly is local and not very common in the Bristol region (Levy and Levy 1998). A single male was taken from hogweed (*Heracleum*) flowers at Max Bog ST 4057 on 25 June 1999.

Volucella inanis (Linnaeus, 1758) (Syrphidae)

This striking hoverfly is known from three previous records in Somerset, only one of these in the north of the county, Leigh Woods in 1917 (Levy and Levy 1998). One male was found at Tickenham Hill ST 4472 on 27 August 2001.

Volucella inflata (Linnaeus, 1794) (Syrphidae)

This attractive black and orange hoverfly was considered to be uncommon by Audcent (1950) but, at least south of Bristol, it appears to be locally common in and around the better areas of woodland (Levy and Levy 1998). It was recorded from Browns Folly ST 7966 on 1 June 1999;

Waltton Common ST 4273 on 27 June 1999; at a sap run issuing from an oak tree (*Quercus*) at Dolebury Warren ST 4558 on 4 July 1999; the Avon Gorge ST 5674 on 8 June 2000; Dowlings Wood ST 6060 on 3 July 2000; Tickenham Hill ST 4472 on 30 May 2000; Slader's Leigh ST 4256 on 11 July 2001 and Weston Big Wood ST 4574 on 12 July 2001.

Volucella zonaria (Poda, 1761) (Syrphidae)

This striking hoverfly was a great rarity in Bristol in Audcent's time, with just one known record. It is now quite frequent within the city of Bristol, but very rarely seen in the surrounding areas. Single individuals were noted at Kingsweston Down ST 5578 and Brandon Hill ST 5772 in July 1999 and at Bath ST 7364 on 23 July 2001.

Xanthandrus comtus (Harris, 1780) (Syrphidae)

There are only about four recent records of this striking hoverfly in north Somerset (Levy and Levy 1998). A single male was netted hovering over a path in scrub at Sand Point ST 3265 on 24 June 2001.

Dorylomorpha hungarica (Aczél, 1939) (Pipunculidae)

This shiny black big-headed fly was recorded from just two sites on the Somerset Levels by Audcent (1950) (as *haemorrhoidalis* (Zetterstedt, 1838)). This little known species proved to be fairly common at Lawrence Weston Moor ST 5479 on 20 May and 30 July 1999 and at Max Bog ST 4057 on 27 July 1999 and 1 May 2000.

Eudorylas zermattensis (Becker, 1898) (Pipunculidae)

Locally this fly seems to be known previously from a single specimen from north Somerset (Coe 1966). A single male was taken in Bath ST 7364 on 17 August 2001.

Pipunculus zugmayeriae Kowarz, 1887 (Pipunculidae)

This species is known from a single old record in Gloucestershire (Alexander 1999). One male was swept at Avonmouth Sewage Farm ST 5379 (V.C. 34) on 29 May 2001.

Micropeza lateralis Meigen, 1826 (Micropezidae)

This stilt-legged fly does not appear to have been recorded previously in Somerset or Gloucestershire. A single female was found at Troopers Hill ST 6373 (V.C. 34) on 16 August 2000.

Lonchaea peregrina Becker, 1895 (Lonchaeidae)

This fly was known from an old, unconfirmed, record near Bristol in Gloucestershire (Collin 1953). A single male was reared from a puparium found under the bark of dead ivy (*Hedera helix*) at Monk Woods ST 7570 (V.C. 6) on 24 May 2000, emerging on 7 June 2000.

Herina palustris (Meigen, 1826) (Ulidiidae)

This small black picture-winged fly was known to Audcent (1950) from two sites in Gloucestershire and one in Somerset. A single male was swept from grassland at Folly Farm ST 6160 on 26 June 1999.

Myopa extricata Collin, 1960 (Conopidae)

This fly was not known from the region in Audcent's time but his collection in Bristol Museum contains specimens from four localities under the name *testacea* (S. Hallett *pers. comm.*). There is one more recent record for Gloucestershire (Alexander 1999). It seems to be frequent but much overlooked and misidentified. It was recorded from Bourton Combe ST 5068 on 9 April

1999. Walton Hill ST 4634 on 3 May 1999. Uphill ST 3157 on 4 May 1999. Staple Hill ST 6575 on 18 April 2001. Troopers Hill ST 6273 on 23 April 2001 and Ivy Thorn Hill ST 4734 on 4 May 2001.

Thecophora fulvipes (Robineau-Desvoidy, 1830) (Conopidae)

This elusive species has been recorded from Stroud and Filton in Gloucestershire (Alexander 1999) and from Shepton Mallet in Somerset most recently in 1948 (Audcent 1950). A male was taken from a *Succisa* flower at Monk Woods ST 7570 (V.C. 34) on the 22 September 2000; swept from grassland at Cross Plain ST 4155 on 15 July 2001 and Tucking Mill ST 7661 on 16 July 2001.

Noeeta pupillata (Fallén, 1814) (Tephritidae)

This attractive species was recorded from Painswick in 1890 (Audcent 1950), but there are no subsequent local records (Clemons 1996). Two individuals were swept from dry grassland at Radstock Sidings ST 6954 on 23 July 1999.

Chetostoma curvinerve (Robineau-Desvoidy, 1830) (Tephritidae)

This orange brown fruit fly has not been recorded before in either Somerset or Gloucestershire. A single male was beaten from the foliage of an oak tree at Monk Woods ST 7570, just on the Somerset side of the border on 1 September 1999.

Euphranta toxoneura (Loew, 1846) (Tephritidae)

This small brownish fruit fly, which develops in the galls of sawflies of the genus *Pontania* on *Salix* is very rare in this area with one record from Leigh Woods, Somerset (Audcent 1950) and one from Stroud, Gloucestershire (Alexander 1999), both more than 60 years ago. A single individual was swept from vegetation in Monk Woods ST 7570 on 15 May 1999.

Gionglossum wiedemanni (Meigen, 1826) (Tephritidae)

This very attractive and rarely encountered fly is known from a single record in Gloucestershire (Alexander 1999). (Audcent 1950) recorded it from a single Somerset site but it was found at Girdano Levels on *Bryonia dioica* on the 1985 Mendips field meeting (Mike Pugh *pers. comm.*). A single individual was found on *Bryonia dioica* growing on a fence at Weston Moor ST 4473 on 14 July 2000.

Orellia falcata (Scopoli, 1763) (Tephritidae)

One of the larger tephritids, this was recorded at three sites in Gloucestershire by Audcent (1950) and there has been one subsequent record (Alexander 1999); in Somerset there is at least one old record in the far south of the county (Clemons 1996). A single individual was swept from a flower-rich meadow at Stockwood Open Space ST 6269 on 14 June 1999.

Cnemacantha muscaria (Fallén, 1823) (Lauxaniidae)

This fly is previously unrecorded in Somerset or Gloucestershire. One was swept from grassland at Tickenham Hill ST 4472 on 30 May 2001.

Homoneura thalhammeri Papp, 1978 (Lauxaniidae)

This would appear to be the first record for the region of this lauxaniid fly, but as it has been recognised as distinct only recently it is likely to be under recorded. One male was swept at Hurldege Hill ST 5959 on 23 June 2001.

Nipromyza albiceps Fallén, 1820 (Lauxaniidae)

This small yellowish fly was previously known from Awkley in Gloucestershire and Clevedon in Somerset (Audcent 1950) and was recorded at Ebbor Gorge on 18 June 1989 by Peter Chandler (*pers. comm.*). It was found at Kingsweston Down ST 5578 on 15 July 1999 and Tucking Mill ST 7661 on 16 May 2000.

Sapromyza basalis Zetterstedt, 1847 (Lauxaniidae)

This fly is known from Oakley Wood in Gloucestershire (Alexander 1999) and there is a record from south Somerset (Mapmate data). It is frequent at Brown's Folly ST 7965, with specimens found on 29 June, 24 August and 25 September 2000.

Chamaemyia fasciata (Loew, 1858) (Chamaemyiidae)

There do not appear to be any previous records for this fly from either Somerset or Gloucestershire. Several specimens were taken at Burledge Hill ST 5959 on 23 June and 4 August 2001.

Colobaea bifasciella (Fallén, 1820) (Sciomyzidae)

This small yellow snail-killing fly was not recorded by Audcent (1950) and there are no subsequent records (Alexander 1999; Ball and McLean 1986). One male was found in a water trap at Weston Moor ST 4473 on 27 August 1999.

Colobaea punctata (Lundbeck, 1923) (Sciomyzidae)

There do not appear to be any records of this snail-killing fly in Gloucestershire or the region (Alexander 1999; Ball and McLean 1986). It was swept from a drying marsh at Avonmouth Sewage Farm ST 5379 (V.C. 34) on 5 July 2001.

Pherbellia annulipes (Zetterstedt, 1846) (Sciomyzidae)

This fly was already known locally from two sites in Gloucestershire (Alexander 1999) and four sites in Somerset (Ball and McLean 1986). It was numerous at Brown's Folly ST 7965 on 29 June 2000.

Pherbellia dorsata (Zetterstedt, 1846) (Sciomyzidae)

Although it is known from several records in the Somerset Levels (Ball and McLean 1986), there is a single record only from Gloucestershire (Alexander 1999). It was swept from marshy vegetation at Avonmouth Sewage Farm ST 5379 (V.C. 34) on 29 May and 5 July 2001.

Pteromicra glabricula (Fallén, 1820) (Sciomyzidae)

This snail-killing fly has only been recorded once in Gloucestershire (Alexander 1999) although it is more frequent in the Somerset Levels (Ball and McLean 1986). It was swept from a drying marsh at Avonmouth Sewage Farm ST 5379 (V.C. 34) on 5 July 2001.

Anticheta brevipennis (Zetterstedt, 1846) (Sciomyzidae)

This black and yellow snail-killing fly was unrecorded by Audcent (1950) and there are no subsequent records from Somerset or Gloucestershire (Alexander 1999; Ball and McLean 1986). One female was taken from a very heavily choked and silted ditch at Weston Moor ST 4473 on 47 August 1999.

Psacadina verbekei Rozkošný, 1975 (Sciomyzidae)

This snail-killing fly was unknown in Audcent's time, but is now known to be reasonably widespread in Gloucestershire (Alexander 1999) and less so in Somerset (Ball and McLean 1986). It was swept from damp areas at Max Bog ST 4057 on 27 July 1999 and 1 May 2000.

Paraclusia tigrina (Fallén, 1820) (Clusiidae)

This very distinctive fly, with boldly marked wings, was not listed by Audcent (1950), but there is a Somerset record from Avon Gorge, June 1980 (E.C.M. d'Assis-Fonseca; record in Invertebrate Site Register). In Gloucestershire there is a single record from Oakley Wood (Alexander 1999). A strong colony was found on a single, naturally fallen, ash *Fraxinus excelsior* at Cleeve Heronry ST 4666 on 15 August 1999 and it was still present there on 11 September 2000.

Scoliocentra confusa (Wahlgren, 1918) (Heleomyzidae)

This small, orange brown fly is very rare in the Bristol region with just a single previous record from Coombe Dingle Gloucestershire in 1947 (Alexander 1999), a site that is now much degraded. This would appear to be the first record for Somerset. A single individual was swept in Monk Woods ST 7570 on 15 May 1999.

Eurina lurida Meigen, 1830 (Chloropidae)

This distinctive fly, one of the larger chloropids, is known from a single record in this area, Hallen in 1927 (Audcent 1950). A single male was swept from *Phragmites* at Littleton Brick Pit ST 5991 on 22 May 2000.

Chlorops adjunctus Becker, 1910 (Chloropidae)

There are no published records of this chloropid fly from Somerset, although it was taken at Draycott Sleights on 30 June 1985 by Peter Chandler (*pers. comm.*) and it is likely to be under recorded. It was swept dry grassland at Purn Hill ST 3357 on 24 May 2001 and Sand Point ST 3265 on 20 August 2001.

Dicraeus tibialis (Macquart, 1835) (Chloropidae)

This very small chloropid fly is recorded from the Somerset Levels and there are unconfirmed records from elsewhere in the county (Falk and Ismay in preparation). It was found at Tickenham Hill ST 4472 on 30 May 2001.

Stegana coleoptrata (Scopoli, 1763) (Drosophilidae)

This small blackish fly is known in this area from just one record, Chalford in Gloucestershire (Audcent 1950) but Alexander (1999) stated that this record is probably referable to *S. similis* Laštovka and Máca. A single female was taken at Monk Woods ST 7570 on 24 July 1999, which is the first Somerset record.

Parydroptera discomyzina Collin, 1913 (Ephydriidae)

This tiny black shore fly was not listed by Audcent (1950) and I know of no records since. One was taken in a water trap at Pawlett Levels ST 3143 on 13 September 1999.

Comisternum decipiens (Haliday in Curtis, 1832) (Scathophagidae)

A dung fly with two old records in Gloucestershire, the latest in 1947 (Audcent 1950; Alexander 1999). One was taken at Monk Woods ST 7570 (V.C. 6) on 24 May 2000.

Hebecnema fumosa (Meigen, 1826) (Muscidae)

This blackish-brown muscid fly was recorded in Somerset from Sharpam in 1929 (Audcent 1950). This was taken in Weston Big Wood on 12 July 2001.

Fannia atripes Stein, 1916 (Fanniidae)

This species was frequently recorded in a suburban garden in Bristol from 1956 to 1985; in

Somerset there are no previous records (Falk and Pont in preparation). A single female was taken at Walton Hill ST 4634 on 4 May 2001.

Fannia norvegica Ringdahl, 1934 (Fanniidae)

This species has been recorded in Gloucestershire but not in Somerset (Falk and Pont in preparation). It was found at Brown's Folly ST 7965 on 29 June 2000 and Burlledge Hill ST 5959 on 4 August 2001.

Eurychaeta palpalis (Robineau-Desvoidy, 1830) (Calliphoridae)

There are previous records of this species from Somerset, including a relatively recent one (1980) (Falk and Pont in preparation). It was taken at Tickenham Hill ST 4472 on 30 May 2001.

Lophosia fasciata Meigen, 1824 (Tachinidae)

This very distinctive elongate black fly, a parasitoid of Heteroptera, was taken in Coombe Dingle in 1945 and 1947 (Audcent 1950); I know of no subsequent records in the Bristol region. It was found at Radstock Sidings ST 6954 on 23 July 1999, Tucking Mill ST 7661 on 19 July 2000 and Weston Big Wood ST 4574 on 12 July 2001.

Exorista tubulosa Herting, 1967 (Tachinidae)

This parasitoid does not appear to have been recorded from the region previously. One male was taken at Tucking Mill ST 7661 on 2 July 2001 and a female (probably of this species) was taken in Cheddar Gorge on 19 July 2001.

Zophomyia temula (Scopoli, 1763) (Tachinidae)

This black parasitoid fly is well distributed in Somerset but very scarce in Gloucestershire (Audcent 1950; Alexander 1999). It was found at Tucking Mill ST 7661 on 16 May 2000.

Cistogaster globosa (Fabricius, 1775) (Tachinidae)

This attractive little fly, another parasitoid of Heteroptera, was recorded in Gloucestershire for the first time in 1999 (Alexander 1999), but there are no previous records for Somerset. One male found was in Cheddar Gorge ST 4754 on 19 July 2001 and many males and a few females were seen in Bath ST 7364 on 23 and 28 July and 14 August 2001.

Acknowledgements

Many people helped with the identification of some of the more critical species. I would like to thank John Ismay (Chloropidae), Adrian Pont (*Fannia*), Peter Dyte (Dolichopodidae), David Clements (Conopidae, Ulidiidae and Tephritidae), Ian McLean (Chamaemyiidae), Chris Raper (Tachinidae), Peter Skidmore (Heleomyzidae) and Peter Chandler (numerous miscellaneous specimens). Keith Alexander very kindly provided information on the status of species in Gloucestershire; Andrew Foster supplied additional data on soldierflies from Prior Park, Bath and Sam Hallett of Bristol City Museum forwarded information on the conopids in the Audcent collection.

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***Xylophagus ater* Meigen (Diptera, Xylophagidae) rediscovered in the Bristol area**

This elusive relict ancient woodland species is listed in J. Charbonnier's *The Diptera of the Bristol District* (1912. *Proceedings of the Bristol Naturalists' Society*, 4th Series, 3(2), 51-75.) as "very rare" in Leigh Woods (ST 57). H.L.F. Audcent's *Bristol Insect Fauna: Diptera* (1949. *Proceedings of the Bristol Naturalists' Society* 27(5), 409-470) was only able to repeat Charbonnier's record and, to my knowledge, there have been no further records from this locality or elsewhere in the Bristol area.

To the south-west, the closest known localities are: Holford (Cowley, J. 1953. *Proceedings of the Somerset Archaeological and Natural History Society* 98(1), 152-153) and Hodders Combe (1988. K.N.A. Alexander unpublished), both in ST 14 in the Quantock Hills, S. Somerset, and - to the north-east - various sites in the central Cotswold Hills, from Cirencester Park Woods (SO 90) northwards, E. Gloucestershire (Alexander in preparation. *The Diptera of Gloucestershire, Part 1 Larger Brachycera. The Gloucestershire Naturalist.*). These two areas lie some 100km apart (see Drake, C.M. 1991. *Provisional Atlas of the Larger Brachycera (Diptera) of Britain and Ireland*. NERC Huntingdon), and so it is a pleasure to report the rediscovery of the species close to the old Leigh Woods site, in Ashton Court Park, N. Somerset, and Blaise Castle Woods, W. Gloucestershire.

During 1996, a series of Owen emergence traps (Owen, J. 1989. *British Journal of Entomology and Natural History* 2, 65-68) were operated within Ashton Court Park (ST 5471) as part of a survey of the wood-decay communities associated with the old oak pollards of Clerken Combe (Alexander, K.N.A. 1997. *Clerkencombe Wood, Ashton Court, Bristol - Survey and Assessment of Saproxyllic Invertebrates*. Unpublished report to Bristol City Council). One

of the traps was stocked with oak branch wood that had been cut live from the old oaks during the winter of 1993/94 and subsequently left on the ground below the parent trees. Eight adult *X. ater* were later found in the collecting chamber of the trap.

A survey of the Blaise Castle Estate (ST 5678) in 1998 (Alexander, K.N.A. 1999. *Blaise Castle Estate Invertebrate Assessment*. Unpublished report to Bristol City Council) led to the discovery of a larva beneath loose bark on a dead oak branch within woodland, 2.xi.1998.

The species is clearly still present in the Bristol area and more widespread than either Charbonnier or Audcent suspected. Its continued survival in Leigh Woods would appear very probable. My thanks to Bristol City Council and English Nature for stimulating and financing this work - **KEITH N.A. ALEXANDER**, 14 Partridge Way, Cirencester, Gloucestershire GL7 1BQ

Further Records of *Aspistes berolinensis* Meigen (Diptera, Scatopsidae) - In two recent articles, Malcolm Hughes (2000. *Dipterists Digest (Second Series)* 7, 82) and Jon Cole (2001. *Dipterists Digest (Second Series)* 8, 20) refer to records of the above distinctive but infrequently recorded scatopsid fly. Freeman (In Freeman, P. and Lane, R. 1985. *Bibionid and Scatopsid Flies. Handbooks for the Identification of British Insects* 9(7). Royal Entomological Society, London) recorded this species from three counties (Cornwall, Devon and Mid Glamorgan) and Hughes (*ibid.*) and Cole (*ibid.*) mentioned unlocalised Irish material and a Cambridgeshire site, respectively. I can add additional records based on my own recording which appreciably increase the known distribution of the species and answer two of the questions posed by the these two authors in their articles.

My records are as follows:

ISLAY: Killinallan Dunes, 21.vi.1992, NR 3072. Specimens were exhibited at the BENHS 1992 Annual Exhibition (*British Journal of Entomology and Natural History* 6 (2): p.71) with a note that the species was frequent on several machair dunes on Islay. I recall finding the species in some numbers on Killinallan Dunes.

LINCOLNSHIRE: Tattershall Sand and Gravel Pits SSSI, 25.v.1995, TF 193597. On artificial inland dunes created by mineral extraction.

LINCOLNSHIRE: Saltfleetby and Theddlethorpe Dunes SSSI, 4.vii. 2001, TF 4791. One female in pitfall trap.

The Islay records considerably extend the known distribution of this species in Britain and answer Hughes' (2000) query as to whether his Conwy record is the most northerly to date. The Tattershall Sand and Gravel Pits record is the second for an inland site, which is all the more significant now since the gravel extraction works at Earith, Cambridgeshire (where Jon Cole took it) have long disappeared and the fly has almost certainly followed. The Saltfleetby-Theddlethorpe Dunes record is the first for the east coast. Further sampling of bare or poorly vegetated sand in inland sand and gravel workings and use of methods such as pitfall traps and vacuum sampling on coastal dunes may reveal more records of this interesting species. It is also worth noting the existence of additional *Aspistes* species in North Europe (Krivoshchina, N.P. 2000. A new and little known species of the genus *Aspistes* Meigen (Diptera, Scatopsidae) from Finland. *Entomologica Fennica* 11, 119-123) and it would be worth checking British (and especially Scottish) specimens using this paper (this has been undertaken for the records presented here) - **ANDY GODFREY**, 90 Bence Lane, Darton, Barnsley, South Yorkshire S75 5DA

***Platycheirus amplus* Curran, 1927 (Diptera, Syrphidae) new to England**

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Summary

Details are given of the first English record of *Platycheirus amplus* Curran, 1927, and comments are made on a short series of males in the *P. peltatus* (Meigen, 1822) *sensu lato* group, taken from various sites in Yorkshire.

During late 2000, Don Smith kindly allowed me to borrow his specimens of *Platycheirus clypeatus* (Meigen, 1822) (*sensu lato*) and *Platycheirus peltatus* (Meigen, 1822) (*sensu lato*), in order that I might examine them, as they had been determined before the taxonomic work of Goeldlin *et al.* (1990), Speight and Goeldlin (1990) and Vockeroth (1990) were published, and had not been checked against these papers nor Stubbs (1996). One male determined as *P. clypeatus* (*sensu lato*) proved to be *P. amplus* Curran, 1927, a species known from Ireland and Scotland (Stubbs 1996, Ball and Morris 2000), but as yet unrecorded from England. This specimen was from Sleightholmedale, V.C. 62 (N.E. Yorkshire), SE 645913, 28.vi.1987, collected by D.H. Smith, determined by A. Grayson. It was taken in a poorly-drained open meadow with seepages, in a wooded valley at the southern edge of the North York Moors.

In the revised key to *Platycheirus* males (Stubbs 1996), couplets 10-11 separate males of the closely related *Platycheirus amplus* Curran, *P. nielseni* Vockeroth and *P. peltatus* (Meigen) *sensu stricto*. Steenis and Goeldlin (1998) provide characters to separate the females.

The following comments are based upon the examination of a short series of male *P. amplus* (the 'Sleightholmedale' specimen), *P. nielseni* (2 specimens from Cawthorne, SE 7789, V.C. 62, different dates), and *P. peltatus sensu stricto* (10 specimens from various sites in V.C. 61, V.C. 62, and V.C. 64). The shape of the mid tibia when viewed in profile, as illustrated in Stubbs (1996), appears to be diagnostic for all three species. Other useful diagnostic characters are the patch of long apically-directed dark posterior hairs arising from slightly below halfway down the mid tibia of *P. amplus*, and the basally-directed tuft of hairs on the swollen apex of the mid tibia of *P. nielseni*. Care must be exercised with the 'inner flag' of hairs near the base of the mid tibia, a character used by Stubbs (1996), as there is a degree of variability in the length and colour of the 'inner flag' in the specimens examined of *P. nielseni* and *P. peltatus* and, particularly in the latter species, the 'inner flag' can be similar to that of *P. amplus*; moreover, if a tibia of *P. peltatus* is not being viewed strictly in profile, it can appear similar to that of *P. amplus*. As correctly stated by Stubbs (1996), *P. amplus* and *P. nielseni* are relatively narrow species. The two male *P. nielseni* from Cawthorne have the second and third tergites virtually square, and the fourth tergite also as long as it is broad, but conspicuously tapered towards the apex. The series of male *P. peltatus sensu stricto* typically have a broader abdomen, with the second and successive tergites distinctly transverse, but, as also correctly stated by Stubbs (1996), males of *P. peltatus* with narrower, virtually square, tergites do occur, even within this short series. The 'Sleightholmedale' *P. amplus* male has the second tergite slightly longer than broad, the third tergite virtually square, and the fourth tergite distinctly transverse.

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***Tachina grossa* (Linnaeus) (Tachinidae) expanding in**

Gloucestershire - Until recently this species did not feature on the county list. However, the first sighting was made in the Cotswolds in 1997 - limestone grassland would appear to be an unusual habitat for the species. Since then there have been a flurry of records from more typical heath-type habitats within the Forest of Dean. Belshaw (1993, Tachinid Flies. Diptera: Tachinidae. *Handbooks for the Identification of British Insects* 10, 4a(i), 1-170) gives the habitat as heathland and open woodland and comments that the majority of British records are from Cornwall, Devon, Dorset and the New Forest (Hampshire). My own records are from Cornwall, Devon, Derbyshire, Anglesey and Gower (West Glamorgan). Interestingly the Gower locality, Nicholaston Burrows (SS 5287) was also from limestone grassland.

The Gloucestershire records are as follows:

- A single individual swept from a trackside at Lower Lutheridge Farm, Nailsworth (ST 89). 10.viii.1997, by A. Taylor during a Gloucestershire Invertebrate Group meeting. The track cuts across Cotswold limestone pastures, albeit rather rank and scrubby through lack of grazing.
- One dead in a spider web, on Poor's Allotment (ST 59), a relict area of heathland on Tidenham Chase, ix.1998, R. Gaunt.
- Subsequently the species has been found widely in typical heath and open woodland habitat across the Forest of Dean (SO 61), with six separate localities reported by J. Phillips and R. Gaunt in 1999 and 2000.

For such a large and distinctive species to have escaped detection in the county for so long is unlikely. These records may be indications of a local range expansion - **KEITH N.A. ALEXANDER**, 14 Partridge Way, Cirencester, Gloucestershire GL7 1BQ

The distribution of saw-wort associated Tephritidae (Diptera) in Cornwall

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Summary

Knowledge of the distribution of *Terellia vectensis* (Collin) and *Urophora spoliata* (Haliday) in Cornwall is reviewed.

Saw-wort *Serratula tinctoria* is the sole known host for *Urophora spoliata* (Haliday) and *Terellia vectensis* (Collin), both until now primarily known in Britain from Hampshire and the Isle of Wight. *Chaetostomella cylindrica* (Robineau-Desvoidy) has also been reared from this and other Asteraceae in Britain while *Acanthophilus helianthi* (Rossi) has been reported from this foodplant only outside Britain (White 1988).

Falk (1992) was only able to list four modern GB sites for the *Terellia* species, in Hampshire, Dorset and the Isle of Wight, although there is an unlocalised old record from South Wales. Clemons (1996) included further sites in Sussex, Wiltshire and Cornwall. Falk (1992) also listed *Urophora spoliata* for some of the same areas in Hampshire and the Isle of Wight, as well as various Cornish localities. Both species were given British Red Data Book Category 3 (Rare) status in Shirt (1987) and this was reaffirmed by Falk (1992).

Urophora spoliata was discovered in Cornwall by Sheppard (1986), in tall and short heath communities in exposed situations on various sections of Goonhilly Downs, within the Lizard National Nature Reserve. It has subsequently been found at a number of localities on the exposed coastal heaths and grass heaths along the north coast of Cornwall. The foodplant occurs scattered through extensive areas of habitat in these situations. The known Cornwall sites are as follows:

SW 61 Clahar Bridge, Goonhilly, 1981; Traboe Downs (east), Goonhilly, 1980; Brays Cot Pool, 1983, DAS.

SW 75 Trevellas Cliff, St Agnes, reared from seed-heads collected 4.v.2001, parasitoids also reared – see below, KNAA.

SX 08 Glebe Cliff, Tintagel, swept on cliff top, 9.vii.2001, KNAA and I Perry.

SX 09 Boscastle Cliffs, reared from seed heads collected v.1990, KNAA (1993).

SX 19 Pentargon Cliff, small numbers swept, 12.vii.1989, KNAA (1991).

Terellia vectensis was added to the Cornwall list more recently (Alexander 1993) and is currently known from two sites in the county:

SX 08 Glebe Cliff, Tintagel, swept cliff top, 9.vii.2001, KNAA and I Perry.

SX 09 Boscastle Cliffs, reared from old seed-heads collected v.1990, KNAA.

A specimen of *Acanthophilus helianthi* was also taken by I. Perry on the occasion of the finds at Glebe Cliff, Tintagel.

The reared *U. spoliata* from Trevellas Cliff were accompanied by five parasitoid wasps (3 females, 2 males) of *Pteromalus albipennis* Walker (Hymenoptera, Pteromalidae). This wasp has been recorded as a parasitoid of several species of non-gall-forming Tephritidae in flower heads of Asteraceae (R.R. Askew *pers. comm.*). The samples of old seed-heads of saw-wort were taken from two separate areas of this site: the exposed coastal slopes and more sheltered

slopes within the coastal valley. Interestingly, the parasitoids were numerous in the valley sample only, suggesting the possibility that parasite load may be heavier for *U. spoliata* in more sheltered situations. This would make an interesting subject for a research project.

Acknowledgements

Thanks to Mark Shaw and Dick Askew for help with discovering the identity of the parasitoid wasps, to Ivan Perry and Jon Cole for their company at Glebe Cliff, to Malcolm Smart for organising the Dipterists Forum field meetings in Cornwall, and to Dave Sheppard for access to his Lizard records.

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***Dilophus bispinosus* Lundström (Diptera, Bibionidae) new to Scotland** - A female of the rare bibionid, *Dilophus bispinosus* Lundström, was captured by the author at Newbattle Woods, near Dalkeith, Midlothian, Scotland (V.C. 83) on 22.viii.2000. The specimen was obtained by sweep-netting through ground layer vegetation in a small area of fairly open deciduous woodland (NT 328663).

The specimen was identified using P. Freeman and R. Lane (1985. Bibionid and Scatopsid flies. *Handbooks for the Identification of British Insects* **9(7)**, 1-74) and confirmed by David M. Robertson. A check through the National Museum of Scotland's insect collection and the Scottish Insect Records Index (SIRI) found no previous Scottish records of this species. According to Freeman and Lane (*loc. cit.*) this species is known only from Berkshire, Hertfordshire and Suffolk in the British Isles, so its discovery in Scotland extends the known range by a considerable amount. I am grateful to David Robertson for helping to determine the specimen and to Graham Rotheray for checking SIRI and the NMS collections. The specimen is deposited in the NMS collections - **BOB SAVILLE**, Lothian Wildlife Information Centre, Room 19, 130 Leith Walk, Edinburgh, Scotland, EH6 5DT

Dipterists Day Exhibits 2001

- compiled by Editor from exhibitors' notes

Again, only those exhibits, which did not also appear at the Exhibition of the British Entomological and Natural History Society, are included here. Details of the exhibits by C.M. Drake, A. Godfrey, R.D. Hawkins, A.E. Stubbs and J. Stubbs will be included in the BENHS Exhibition Report. It has been necessary this year to omit details for most of those exhibits for which no notes were submitted and all exhibitors are urged to provide notes in future years.

COLE, J.H. — Some uncommon flies from Dogsthorpe Star Pit SSSI and Northamptonshire Wildlife Trust Reserve (TF 215025), recorded during 2001. This is a flooded clay-pit fed by a saline spring on the north-east edge of Peterborough. A marsh at one end of the lake grades into grassland, with some open scrub, and has a series of banks, channels and open pools with a rich flora. The site is in administrative Cambridgeshire but is part of V.C. 32 – Northamptonshire, a seriously under-recorded county so all the species exhibited, with the exception of *Oxycera morrisii*, are thought to be new county records: *Dicranomyia danica* (Kuntze) (Limoniidae), 1♂ 20.vi and 1♂ 20.viii but quite numerous on 4.x; *Eriocnopa diuturna* (Walker) (Limoniidae), a few mixed with the very similar and numerous *E. trivialis* (Meigen) on 4.x; *Oxycera morrisii* Curtis (Stratiomyidae), 1♀ 19.vii; *Chrysotus suavis* Loew (Dolichopodidae), several on 2.vii; *Dorylomorpha clavifemora* Coe (Pipunculidae), 1♀ 20.vi, a rare species known mainly from Chippenham Fen NNR, Cambridgeshire; *Myopites imulaedysentericae* Blot (Tephritidae), numerous on 25.vii on large patches of flowering fleabane *Pulicaria dysenterica*, one of the most northerly records; *Dasiops hennigi* Morge (Lonchaeidae), 1♀ 20.vi; *Phytobia errans* (Meigen) (Agromyzidae), 1♂ 2.vii – there are very few British records and the food-plant is unknown; *Themira biloba* Andersson (Sepsidae), 1♂ 20.viii, possibly associated with water fowl droppings; *Phyllomyza flavitarsis* (Meigen) (Milichiidae), 1♀ 25.v, possibly associated with ants; *Ochthera manicata* Fabricius (Ephydriidae), several on 25.vii and 20.viii, numerous on 4.x, the second post-industrial site for this East Anglian fen species following Martin Drake's discovery of it at Orton Pits Reserve on the southern edge of Peterborough (Drake, C.M. 1999. *Dipterists Digest* (Second Series) 6, 40-42); *Specafrons halophila* (Duda) (Chloropidae), several on 2.vii, 25.vii and 4.x.

CROSSLEY, R. — Some Yorkshire Diptera collected in 2001: in spite of many restrictions caused by Foot and Mouth Disease, a number of sites were accessible throughout much of the season and the opportunity was taken to explore some of these areas, for which there has in the past been insufficient time available. *Idiocera bradleyi* (Edwards) (Limoniidae), 1♀, North Ferriby, at seepages on silty/clay river cliffs on the Humber, 40km from the coast, known from two or three coastal seepage sites and an isolated one in Cropton Forest on the North York Moors; *Symplecta novaezembiae* s. *scotica* (Edwards) (Limoniidae), 1♂, a series collected at cliff seepages at Reighton, south of Filey, were presumed to be this species, including males which cannot be satisfactorily named at present; *Poecilobothrus principalis* (Loew) (Dolichopodidae), 1♂, Kilnsea, by the edge of slightly brackish pools "scraped" to attract wading birds near the Spurn Observatory cottage, new to Yorkshire; *Tachytrechus insignis* (Stannius) (Dolichopodidae), 1♂, 1♀, Kilnsea, on the bare sandy edge of a brackish ditch near the shore, new to Yorkshire; *Cheilosia ranunculi* Doczkal (Syrphidae), 1♂, the first Yorkshire specimens were found at an extensive patch of lesser celandines *Ranunculus ficaria* in a wood in the industrial West Riding; no *C. albitarsis* (Meigen) were taken with them but later at Askham Bog, York, a single ♂ was found with many *C. albitarsis* amongst creeping buttercups *Ranunculus repens*; *Xanthandrus comtus* (Harris) (Syrphidae), 1♀, flying sluggishly

amongst fleabane *Pulicaria dysenterica* by a parkland pond at Castle Howard, the first specimen seen in Yorkshire by the exhibitor and rarely recorded in the county; *Salticella fasciata* (Meigen) (Sciomyzidae), 1♀, Spurn Peninsula, the only known Yorkshire locality, where it was first recorded in 1927 and again in 1950; *Ditaeniella grisescens* (Meigen) (Sciomyzidae), 1♀, Kilnsea, taken at the same time as *P. principalis*, the first authenticated Yorkshire record.

DAMANT, S.G. — Photographs of *Callicera spinolae* Rondani and *Pocota personata* (Harris) (Syrphidae) from Wimpole Park, Cambridgeshire. Other species in an exhibit of Diptera recorded at the same site included *Chrysopilus laetus* Zetterstedt (Rhagionidae), *Callicera aurata* (Rossi) and *Ferdinandea ruficornis* (Fabricius) (Syrphidae) and *Lophosia fasciata* (Tachinidae).

GIBBS, D. J. — Scarce Diptera found in 2001 (some dealt with in the article by this author in the present issue are listed without further comment here): *Tipula helvola* Loew (Tipulidae), Pine Wood, Berkshire, V.C. 22, SU 8365, 27 July 2001, mixed woodland on acid substrate; *Macrocera longibrachiatum* Landrock (Keroplatidae); *Brachypeza bisignata* Winnertz (Mycetophilidae), Pine Wood, Berkshire, V.C. 22, SU 8365, 27 July 2001, mixed woodland on acid substrate; becoming commoner with records from 19 counties including Berkshire (P.J. Chandler pers. comm.); *Exechiopsis membranacea* (Lundström) (Mycetophilidae); *Symphoromyia immaculata* (Meigen) (Rhagionidae); *Ogcodes gibbosus* (Linnaeus) (Acroceridae); *Choerades marginatus* (Linnaeus) (Asilidae), Tucking Mill, Somerset, V.C. 6, ST 7661, 2 July 2001, calcareous flower rich meadow; *Orthoceratium lacustre* (Scopoli) (Dolichopodidae); *Rhaphium fascipes* (Meigen) (Dolichopodidae), Stokeford Heath, Dorset, V.C. 9, SY 8788, 7 May 2001, swept from ponds on heathland; *Neurigona suturalis* (Fallén) (Dolichopodidae); *Campsicnemus compeditus* Loew (Dolichopodidae), Stokeford Heath, Dorset, V.C. 9, SY 8788, 7 May 2001, swept from valley bog on heathland; *Campsicnemus pumilio* (Zetterstedt) (Dolichopodidae), Stokeford Heath, Dorset, V.C. 9, SY 8788, 6 July 2001, swept from ponds on heathland; *Volucella inanis* (Linnaeus) (Syrphidae); *Xanthandrus comtus* (Harris) (Syrphidae); *Pipunculus zugmayeriae* Kowarz (Pipunculidae); *Eudorylas zermattensis* (Becker) (Pipunculidae); *Conops vesicularis* Linnaeus (Conopidae), Stokeford Heath, Dorset, V.C. 9, SY 8788, 4 June 2001; *Myopa fasciata* Meigen (Conopidae), Stokeford Heath, Dorset, V.C. 9, SY 8788, 30 July 2001, common on heather heathland; *Homoneura thalhammeri* Papp (Lauxaniidae); *Cnemocantha muscaria* (Fallén) (Lauxaniidae); *Colobaea punctata* (Lundbeck) (Sciomyzidae); *Pherbellia griseola* (Fallén) (Sciomyzidae), Ivy Thorn Hill, Somerset, V.C. 6 ST 47 34, 26 July 2001, swept from grassland close to woodland; *Pteromicra glabricula* (Fallén) (Sciomyzidae); *Fannia atripes* Stein (Fanniidae); *Exorista tubulosa* Herting (Tachinidae); *Cistogaster globosa* (Fabricius) (Tachinidae); *Phytomyptera nigrina* (Meigen) (Tachinidae), Stokeford Heath, Dorset, V.C. 9, SY 8788, 28 August 2001, swept from heather heathland.

HALSTEAD, A. — *Tipula flavolineata* Meigen (Tipulidae), a male and female reared from final instar larvae found in the rotting stems of a dead *Berberis* species shrub at RHS Garden, Wisley, Surrey; the larvae were collected on 2 March 2001 and were pupating by mid March, the adults emerging on 2 April 2001.

ILIFF, D. — (1) Photographs of two examples of *Villa* (Bombyliidae), suspected to be *V. cingulata* (Meigen) at a site in the central Cotswolds on 1 July 2001, when several examples were found.

(2) Photographs of two hoverflies (Syrphidae) seen in Hong Kong in October 2001: *Ischiodon scutellaris* (Fabricius), a male hovering in Hong Kong Botanic Gardens on 7.x.2001; *Dideopsis aegrotata* (Fabricius), a male in Aberdeen Country Park, 9.x.2001, a species with iridescent blue wing clouds which fade to brown in dead specimens — several local Hymenoptera also have blue wing markings.

PALMER, C. — (1) Male and female examples of *Cheilosia canicularis* (Panzer) and *C. himantopus* (Panzer) to illustrate the differences given by J.-H. Stuke and C. Claussen (2000.

Cheliosia canicularis auctt. – a species complex. *Volucella* 5, 79-94). *C. canicularis* (both sexes) were from les Hôpitaux-Neufs, Doubs, France, 20.viii.2001; *C. himantopus* male, les Bossons, Chamonix, Haute-Savoie, France, 24.vi.2000 and female, Forêt de St. Gobain, St Nicolas-aux-Bois, Aisne, France, 15.v.1997.

(2) Sample pages from the Hampshire County Council Museums Service website (www.Hampshire.gov.uk/museum/biology) giving information about the collections and access to them.

SMART, M.J. — Some rare or extinct British Asilidae not shown in the colour plates of the recently published book "*British Soldierflies and their Allies*" by A.E. Stubbs and C.M. Drake, which contains a series of colour plates illustrating most of the known British species of the families covered. A few species were omitted either because no specimens in good condition were available at the time the colour plates were prepared or because the species is considered to be extinct in Britain (not recorded since before 1900). This exhibit showed photographs (5x life size) and specimens of three of the omitted species of Asilidae, illustrating their generic and specific characters. The species exhibited were:

- *Neomochtherus pallipes* (Meigen) (first recorded from Britain after the plates were prepared). ♂ and ♀ specimens from the Netherlands, photographs of ♂ from above and side;

- *Machimus cowini* (Hobby). ♂ and ♀ specimens from the Isle of Man, photographs of both;

- *Dasypogon diadema* (Fabricius) (recorded from South Wales during the 19th century), ♂ and ♀ specimens from Germany, photographs of both.

SMITH, M.N. — A selection of uncommon Diptera taken in 2001 (except *Drino lota*): *Stratiomys potamida* (Meigen) (Stratiomyidae), Littlemore, Oxfordshire, SP 5402, V.C. 23, 30.vii; *Acinia corniculata* (Zetterstedt) (Tephritidae), Barton, Oxfordshire, SP 5408, V.C. 23, 30.vii, swept from rough field with *Centaurea*; *Macronychia striginervis* (Zetterstedt) (Sarcophagidae), Littlemore, Oxfordshire, SP 5402, V.C. 23, 30.vii; the following Tachinidae: *Carcelia puberula* Mesnil. Great Hazes, Shurlock Row, Berkshire, SU 8574, V.C. 22, 7.v, possibly the fifth British record of this species; *Hemyda vittata* (Meigen), Great Hazes, Shurlock Row, Berkshire, SU 8574, V.C. 22, 25.vii; *Drino lota* (Meigen), The Bomb Dump, Greenham Common, Berkshire, SU 5065, V.C. 22, 15.vii.2000; *Sturmia bella* (Meigen), Purn House Farm, Hleadon Level, Somerset, ST 3156, V.C. 6, 6.ix, second record for Somerset; *Gymnosoma rotundatum* (Linnaeus), Chappets Copse, Hampshire, SU 6522, V.C. 12, 9.viii.

***Microsania vrydaghi* Collart, 1954 (Diptera, Platypezidae)
new to Britain**

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Summary

Chandler (2001) included six European species of *Microsania*, of which four are recorded in Britain (Chandler 1998). One further species, *Microsania vrydaghi* Collart, 1954, has now been taken in Britain.

On 2 August 2001 the writer was collecting in Wytham Woods, Oxfordshire (formerly Berkshire, Watsonian vice-county 22). There was a large bonfire at the sawmill (SP 46710856) and sweeping the smoke produced a small number of flies of the genus *Microsania*. The bonfire was fuelled by a large felled *Cupressus* (possibly *C. leylandii*) and was a large and very hot fire. The flies were in the margins of the plume of flame and smoke, in low numbers. Nine males were kept, of which eight were *M. pectipennis* (Meigen) and one was keyed to *M. vrydaghi* using Chandler (2001). This specimen was subsequently sent to Peter Chandler who kindly confirmed the identification. The specimen is deposited in the Hope Entomological Collections.

Microsania vrydaghi is not an unexpected addition to the British list, since Chandler (2001) recorded it from Sweden, Belgium, Greece and Switzerland. Wytham Wood is an area of old woodland used for teaching and research by the University of Oxford and many rare dead wood Diptera have been recorded there. However, *Microsania* species have been found in a variety of natural and disturbed habitats.

Chandler (2001) provided a key to the six European species of *Microsania*, which is not repeated here; he also figured the genitalia of all the species. The key identifies only the males of the *M. vrydaghi* and *M. meridionalis* group. For those without access to Peter Chandler's fine work the key characters leading to *M. vrydaghi* are: posterior tibia not distinctly bent about middle or posterior femur sharply tapered apically; posterior trochanter with fine setae only; posterior tibia without a ventral apical spur; only 4 strong notopleural setae and posterior femur with length of dorsal setae two-thirds depth of femur and not conspicuously longer on basal half than on apical half. The male genitalia have a comb of coarse setae on the apex of the gonopod.

Acknowledgements

I thank Peter Chandler for confirming the identification. Professor S.J. Simpson, Curator, Hope Entomological Collections, Oxford gave access to collections and research facilities. I thank Nigel Fisher (Conservator of Wytham Wood) for permission to collect in the Wood. Darren Mann and Barbara Mueller kindly read the manuscript.

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***Paraplatypeza bicincta* (Szilády, 1941) (Diptera, Platypezidae)
new to Britain**

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Summary

Chandler (2001) recognised two European species of *Paraplatypeza*, of which only *P. atra* (Meigen, 1804) was recorded from Britain (Chandler 1998). The second species, *P. bicincta* (Szilády, 1941), has now been taken in Britain.

On 17 October 2001 a single female of *Paraplatypeza bicincta* (Szilády, 1941) (Platypezidae) was swept in Winterdown Wood, West End Common, Esher, Surrey. This area comprises deciduous woodland on a slope adjacent to the River Mole, with wetter woodland near the riverbank. The precise location was not recorded and a further visit two days later failed to locate any other examples of this species. These visits were arranged to increase knowledge of the Diptera fauna of the Esher Commons, an area already well-known for Coleoptera, being ranked eleventh nationally as a site for saproxylic Coleoptera based on the Index of Ecological Continuity, with West End Common producing many of the records (Jonty Denton *pers. comm.*).

Chandler (2001) provided a key to the European species of Platypezidae, which enabled *P. bicincta* to be recognised. The only other European species of the genus, *P. atra* (Meigen), is common and widespread in Britain. The males of the two species are rather similar, being mainly black and both are distinguished from other all black platypezine males by presence of a tuft of bristles at the upper angle of the frons. The male of *P. bicincta* has the wings slightly brownish yellow tinged while the wings are clear in *P. atra* males and the females of both species. Apart from differences in the genitalia (figured by Chandler 2001) *atra* males also have tergite 6 more distinctly grey dusted in contrast to the rest of the abdomen. The female is easily distinguished because that of *P. atra* has the abdomen mainly black while *P. bicincta* female has a distinct pattern of silvery grey dusting on the tergites (all of tergite 1, a medially interrupted basal band on 2, larger lateral patches occupying most of 3 and 4, small lateral patches on 5 and all of 6). The first two segments of the female hind tarsus of *P. bicincta* are also contrasted yellowish while this tarsus is all dark in *P. atra*.

Paraplatypeza atra is well known to develop in the lignicolous gill fungus *Pluteus cervinus*, records from some other fungi including some polypores being thought to require confirmation (Chandler 2001, who described and figured the larva and puparium). The biology of *P. bicincta* is unknown but development in gill fungi, which provide the hosts of most Platypezinae, is probable. It is known from Scandinavia and central Europe, as well as the far east of Russia and even Burma (Chandler 2001) but appears to be generally scarce. Schacht (2001) recorded it as new to Germany. Its flight period is August to October, while *P. atra* is known to fly from April to November.

The British Platypezidae were thought to be well known, with 30 of the 44 European species recorded (Chandler 1998), only three of which have been added in the past 25 years, so it is surprising that two species new to the British list – *P. bicincta* and *Microsanina vrydaghi* (Collart) recorded above by John Ismay, should turn up in the same year. It is hoped that more may be learned of the biology of these species now that they are known to be members of the British fauna.

On the two visits to West End Common altogether seven species of Platypezidae were recorded and on 19 October several species were observed alighting on and running about on the leaves of turkey oak *Quercus cerris* near the top of the slope in Winterdown Wood. These included males of *Agathomyia unicolor* Oldenberg and females of *Platypeza consobrina* Zetterstedt,

Proclitus modesta (Zetterstedt) and *Lindneromyia dorsalis* (Meigen). Elsewhere on the Common *P. modesta* and *Platypeza fasciata* Meigen were found around their host honey fungus *Armillaria mellea* and on 17 October a female of *Agathomyia falleni* (Zetterstedt) was recorded on foliage of sycamore *Acer pseudoplatanus* near the north end of the common. *Agathomyia falleni*, although formerly thought scarce and confined in Britain to the south east of England, has been found at several localities in the London area (including Buckingham Palace Garden) in recent years. Like *A. unicolor* it develops in the common bracket fungus *Bjerkandera adusta*.

Acknowledgements

The British specimen was found during a survey carried out at the request of Jonty Denton on behalf of Elmbridge Borough Council and I am grateful to them for the opportunity to visit this interesting site. Both *P. bicincta* and *M. vrydaghi* were exhibited at the 2001 BENHS Annual Exhibition and I am grateful to John Ismay for permitting me to include his specimen in the exhibit.

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***Paraclisia tigrina* (Fallén) (Diptera, Clusiidae) attracted to an artificial tree-hole of wild service wood, *Sorbus torminalis* (Linnaeus) Crantz, in East Sussex -**

On 13 July 2001 I found an adult female *Paraclisia tigrina* (Fallén) in a sleeve trap suspended over an artificial, water-filled tree hole in our garden in Sedlescombe, East Sussex (TQ 783188). The 'tree hole' consisted of a plastic bucket filled with rainwater, dead leaves and protruding lengths of wood sawn from a living branch of wild service *Sorbus torminalis*, which had blown down in a gale in late September 1999. The bucket was positioned on the ground underneath a tree-hole-free, 25 year-old wild service, with the sleeve net suspended so that its lower hem was a short distance below the bucket rim.

Many of the insects found in this trap in its two years of operation are associated with rot holes and I have no doubt that the *Paraclisia* was visiting in search of a suitable site for oviposition. A few old beech trees, on which the species is often found, occur about 1 kilometre away but are not common in the area. There are, however, many other trees with suitable breeding sites for this species.

I have not previously come across *P. tigrina* in this area in many years of studying Diptera and this episode would imply, as indicated by A.E. Stubbs (1982. *Proceedings and Transactions of the British Entomological and Natural History Society* 15, 89-93), E.A. and M.A. Howe and J.H. Bratton (2000. *Dipterists Digest (Second Series)* 7, 80), R.A. Jones (2000. *Dipterists Digest (Second Series)* 7, 108) and A.P. Foster (2001. *Dipterists Digest (Second Series)* 8, 91-126.), that the species is widespread, but uncommon, in southern Britain and capable of exploring widely to find suitable new habitats - **PATRICK ROPER**, South View, Churchland Lane, Sedlescombe, East Sussex TN33 0PF

A breeding site survey of Simuliidae (blackflies) in South East England. Part 1: Sampling sites and species distribution records

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Summary

Collections of larvae, pupae and adults of Simuliidae (Diptera) were made from 1961 to 2001, but principally from 1972 to 1987, from rivers, streams, lake outfalls, springs, ditches and other potential breeding places in South East England. The material consists of about 1700 alcohol vials of the aquatic stages and approximately 1500 micro-pinned adult flies reared from pupae; it is deposited in the Natural History Museum, London. The paper is a compilation of data from samples collected at 800 sites over the 40 years' collecting period. It lists the collecting sites with their O.S. grid references to 100-metre accuracy, provides the site records (with maps on a 10km square basis) for each of the 22 species and species complexes found to comprise the blackfly fauna of this part of Britain, and notes the aquatic habitat preferences and seasonality of each taxon. Remarks are included where appropriate to call attention to special points such as the availability of cytological data for certain taxa.

Introduction

The Simuliidae (blackflies) are unusual Diptera in several respects. For example, no other flies have pupae providing taxonomic characters to a similar degree and few other families of any size have immature stages so tightly confined to only one type of developmental environment - in the case of simuliids to the 'lotic' habitat of running water. The consequence of these peculiarities is that faunal surveys for Simuliidae are based not on collection of adult flies but on collection of the larval and pupal stages: confinement of the immatures to lotic habitat provides focus for sampling the fauna and the fact that in many species the pupae are actually much easier to determine than the adults is a great aid to identification. Places where larvae and pupae occur are conventionally called 'breeding sites' and we use the term in this paper.

Simuliids have been quite widely studied in Britain since Davies (1966, 1968) provided a taxonomic revision, identification keys and preliminary grid-based British distribution maps, but an intensive survey of a chosen major part of the country has not till now been available. In this work we present the results of a faunal survey of simuliid breeding sites in South East England that we began in a small way in the 1960s, continued apace in the 1970s and 1980s and discontinued (after 40-years accumulation of data) in the spring of 2001. By this time we had sampled 800 sites, and thought that the data should now be collated for publication rather than left at some risk of becoming effectively lost; besides, no further species or species complexes had been added to the list for South East England since 1974, suggesting that (at morphospecies level) the simuliid faunal composition had been firmly established.

For our purpose South East England is the area that was covered by the O.S. 1: 250,000 map of that title current in the 1960s when our survey began. It extends east from the 50 line in 100km squares SP/SU and south from the 40 line in 100km squares SP/TL/TM and has a land surface area of about 22,500 square kilometres. It covers all or part of 14 counties (Fig. 1). Positions of the 800 collecting sites are shown in Fig. 2: the larger blank areas on this map represent negative areas in which no breeding sites could be found (as detailed in Part 2 of this work). The present Part 1 provides the locality data and the individual species' records; Part 2 will discuss general findings in relation to environmental factors such as the geological background. As our data were gathered over many years there have been changes in the suitability of a few rivers and streams as breeding habitat, caused by water abstraction,

culverting, pollution and other human interference; nevertheless, we see the information we provide as a baseline against which later surveys can be assessed. (Some areas were a little better collected than others because the survey was not part of RWC's work when in post as a dipterist with the Natural History Museum (BMNH) and was mainly a weekend interest.)

The simuliid fauna of the Isle of Wight has been separately covered as not part of South East England (Crosskey 1982) and some records for London, repeated here for completeness, have been given earlier (Crosskey 1985a).

Methods and materials

Pupae and larvae were collected from their lotic habitats into 80% ethyl alcohol (ethanol), the alcohol strength used for permanent preservation of specimens in the Diptera spirit collections of the BMNH. In accord with BMNH curatorial procedure for the simuliid collection they are contained in 50 x 12.5mm glass vials with cotton-wool plugs, the vials inverted for safety in alcohol bath jars. In the field, many pupae that had reached an advanced stage of development (as judged by their black appearance) were prised from their substrates and set aside individually for rearing of adult flies, using a simple but effective method recently described and illustrated (Crosskey 1997). The reared adults were killed and micro-pinned after a short hardening period, then staged individually on short *Polyporus* strips. The pupal exuviae/cocoon of each reared fly was dried and gummed on a card strip attached to the same carrier pin as the staged adult. Each alcohol vial and dry adult was provided with three separate labels giving the locality, the O.S. Grid Reference (to the 100 metres, two letters/six numerals), and the species name. Mixed samples were always sorted to species, thus ensuring that there is no unworked residue of material still stored only on a locality basis.

All materials relating to our survey have been placed in the Diptera collection in the BMNH Department of Entomology. They comprise the specimens, record cards and original maps used in the field. Specimens: these consist of pupae and larvae (uncounted, ? 25,000-30,000 individuals) preserved in about 1700 alcohol vials, 1487 pinned adult flies each with its pupal exuviae and 449 alcohol-preserved adults. Each bath jar of larval and pupal material contains a three-line printed label SIMULIIDAE/SOUTH EAST ENGLAND VOUCHER COLLECTION/(R.W. CROSSKEY) on which is given the species name and the county (counties) source. Record cards: these are 8" x 5" ruled cards stored in two labelled card-boxes and carrying the handwritten data applicable to each species or complex, i.e. place, grid reference, date, life stages collected, names of any co-occurrent species, and for each entry the number correlating with the master locality list as given in this paper. Most collections were made before the personal computer age and the data are not on disk; they can, however, be supplied to the Biological Records Centre for electronic database purposes if desirable. Maps: these consist of 21 sheets of the old O.S. 'One-Inch Series' on which are marked, using diagonal crosses, the 800 positive breeding sites; some 600 negative sites are also shown, using open circles. (After the 1:50,000 O.S. 'Landranger' map series was introduced we continued to use the 'One-Inch Series' because the metric O.S. Grid is shown on them more conspicuously in black instead of blue and in order to maintain map-scale uniformity.)

List of species and species-complexes collected in South East England

Our collection is representative of two-thirds of the British simuliid fauna inasmuch as it contains specimens of 22 named species (including complexes) out of the 33 currently known in Britain*. These are listed below, using the nomenclature of Crosskey in Chandler (1998) and the species sequence used by Bass (1998) in his keys to the pupal and larval stages. Subgeneric names are omitted from the list but are provided in the text heading for each species or complex. The synonyms shown, indented under the valid names, are names that at some time have been used in literature relating to South East England.

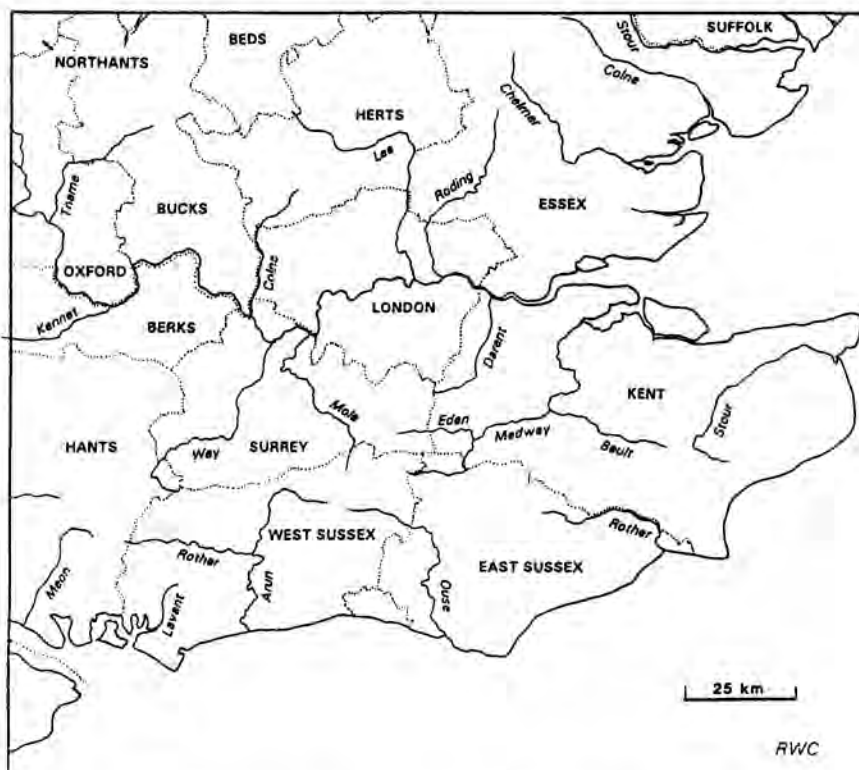


Fig. 1. Survey area for breeding sites of Simuliidae in South East England. The area extends north to the 40 line in 100km squares SP/TL/TM and west to the 50 line in 100km squares SP/SU (see Fig. 2). County boundaries dotted and only main rivers shown. Conventional county abbreviations used are: Beds = Bedfordshire, Berks = Berkshire, Bucks = Buckinghamshire, Hants = Hampshire, Herts = Hertfordshire, Northants = Northamptonshire.

- Prosimulium tomosvaryi* (Enderlein)
- P. arvernense* Grenier
- Metacnephia amphora* Ladle & Bass
- Simulium latipes* (Meigen)
- S. subexcisum* Edwards
- S. yerburyi* Edwards
- Simulium angustitarse* (Lundström)
- Simulium lundstromi* (Enderlein)
- [*S. angustitarse*: Davies not Lundström]

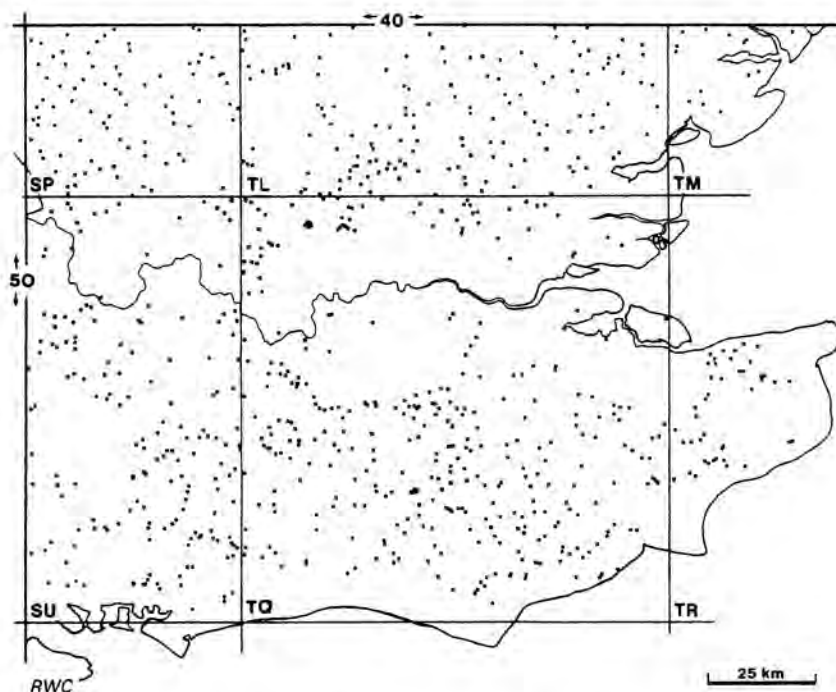


Fig. 2. Survey area for breeding sites of Simuliidae in South East England, showing positions of the 800 collecting sites and the 100km square grid. Blank areas of the map are those that, for various reasons, lack suitable lotic habitat (as elaborated in Part 2 of this work, Crosskey and Crosskey in press, to appear in the next issue of this journal).

Simulium armoricanum Doby & David

Simulium cryophilum (Ruttschov) (species-complex)

S. brevicorne Davies

S. cryophilum 'Typical form' Bass (? = cytoform 'A')

S. cryophilum 'Atypical form' Bass

S. cryophilum chromosomal sibling 'A' Hunter

Simulium vernum Macquart (species-complex)

S. vernum chromosomal sibling 'Knebworth' (= *vernum* standard)

S. vernum chromosomal sibling 'Dorset IIs-1'

Simulium urbanum Davies

Simulium costatum Friederichs

Simulium angustipes Edwards
S. aureum-group chromosomal sibling 'E' Dunbar
Simulium aureum Fries
S. aureum-group chromosomal sibling 'F' Dunbar
Simulium lineatum (Meigen)
S. salopiense Edwards
Simulium pseudequinum Séguy
Simulium equinum (Linnaeus)
Simulium erythrocephalum (De Geer)
Simulium intermedium Roubaud
S. nitidifrons Edwards
Simulium ornatum Meigen (species-complex)
Simulium trifasciatum Curtis
S. spinosum Doby & Deblock
Simulium posticatum Meigen
S. austeni Edwards
Simulium reptans (Linnaeus)
Simulium noelleri Friederichs
 [argyreatum: Davies not Meigen]

**Simulium morsitans* Edwards is recorded at one site in South East England on the British distribution map for this species in Davies (1968: 116). However, examination of the two adult females on which the spot-record is based shows them to be *S. posticatum* (BMNH, data 'Surrey Box Hill 9.v.50 F. van Emden'). There is no verified record for *S. morsitans* in South East England.

***Prosimulium (Prosimulium) tomosvaryi* (Enderlein)**

Breeding site records

East Sussex: 567, 598, 606, 624, 651, 655, 664, 670, 674, 693

See Fig. 3A for 10km square basis.

Habitat and seasonality

The only area of South East England where this species occurs is East Sussex. Here the lotic habitat is provided by the perennial 'ghyll' streams, unspoiled watercourses often in deep wooded valleys and typically associated with heavy Wealden clay; the water is acidic, often iron-rich and usually under woodland shade. The immature stages occur mainly where water runs quickly over pebble races at bends in the stream courses. At Site 606 larvae were found on 11 April 1992 where the stones were covered in a loose orange-red floccular deposit of iron bacteria, these larvae showing up black through the water against the orange-red appearance of the stone substrates. The species is univoltine, the period of pupation being no more than three or four weeks in spring. Pupae were collected on various dates from 14 April to 9 May.

Remarks

Prosimulium in Britain has a characteristically northern and western distribution virtually confined to areas ecologically defined as 'uplands' (e.g. by Miles 1981). The presence of *P. tomosvaryi* in East Sussex - the only part of lowland England where it occurs - is remarkable, this part of the distribution apparently representing a relict isolated population surviving here because the land is not suitable for crop production and the natural environment relatively undisturbed. *Prosimulium tomosvaryi* has been studied chromosomally in French and Czech

populations (Basrur 1959 as *hirtipes arvernense* Grenier and *vigintiquaterni* [misidentified]) but it remains unknown whether British populations are cytotaxonomically identical. In April 1979 larvae from East Sussex Site 693 fixed for chromosomal study were sent to the late K.H. Rothfels, who reported them (KHR to RWC *in litt.*) as placeable in a *Prosimulium* cytotophylogeny, but no follow-up was reported. Further chromosomal study of the East Sussex population would have special interest.

***Metacnephia amphora* Ladle & Bass**

Breeding site records

West Sussex: 160, 166, 168, 187, 189.

See Fig. 3B for 10km square basis.

Habitat and seasonality

This rare species, first described from a chalk winterbourne in Dorset (Ladle and Bass 1975), is known only from a few other winterbournes in that county and in two similar winterbournes (Lavant and Ems) in West Sussex. Such habitats are temporary, flowing well only in winter and spring and typically drying up by early summer, even by May after dry winters. Flow is capricious, depending how rainfall tops up the aquifers. For example, on 4 May 1996 when the Lavant was visited it was at very low level and had all but ceased to flow whereas in the year 2000 it reached such an unprecedented level for some weeks as to flood the centre of Chichester. The West Sussex habitats, as typical of chalk bournes, are open and unshaded and their water, derived from aquifers in the chalk, is considerably alkaline from dissolved calcium carbonate. Larvae and pupae attach almost solely to broad-blade grasses near the water surface. The species is univoltine and must aestivate as eggs that survive the dry period in stream-bed sediments. Pupae were collected on dates from 22 April to 30 April (various years 1974-1994); however later pupation occurs, as larvae were found at Site 189 on 12 May. (At the Dorset type locality the recorded date span for pupae is 5 April to 3 May: Ladle and Bass 1975.)

Remarks

Many larvae, fixed for cytotoxic study, collected by us from the Lavant at East Lavant (Site 189) on 14.iv and 12.v.1979, were sent to K.H. Rothfels (Toronto), and later placed by Procnier (1982) in a published phylogeny for *Metacnephia*. The polytene chromosomes did not differ from those of larvae from the type locality, Winterbourne Came in Dorset, studied by Petrova (1981) and Procnier (1982).

***Simulium (Hellichiella) latipes* (Meigen)**

Breeding site records

Berkshire: 217. Buckinghamshire: 38, 40, 41. East Sussex: 543, 632, 642, 678. Essex: 337, 350. Hampshire: 99, 159. Hertfordshire: 282, 316. Kent: 752, 755, 777, 788. London: 483. Oxfordshire: 98, 137. Surrey: 473. West Sussex: 166, 189.

See Fig. 3C for 10km square basis.

Habitat and seasonality

This is a species of small summer-drying watercourses such as bog and pasture seepages, overflow from shallow ponds, open drainage ditches and small rills in or near woods - locations often overlooked which, at the same place, vary in character from year to year. Crosskey (1985b) provided a more detailed description. The species is rather rare but, in accordance with the diversity of acceptable lotic habitat, quite widely distributed (as evident from the eleven counties listed above). The species is univoltine. Pupae were collected on dates from 21 March

to 8 May; Edwards (1920) obtained the pupa from which he reared the adult female holotype of *yerburyi* (synonym of *latipes*) on 10 May [1920].

Remarks

The type locality of the nominal species *Simulium yerburyi* Edwards lies within the South East England area and is Knebworth Wood in Hertfordshire (as nearly as can be determined about TL 218208). It is now clear (Crosskey 1985b) that in *Simulium latipes* the number of pupal gill filaments is widely variable (although 2-upper and 4-lower filaments is the usual configuration) and that because of variability *S. yerburyi* Edwards must be considered a synonym of *latipes*. The *Simulium yerburyi* holotype is in the BMNH collection.

Davies' (1968: 102) map shows six 10km square spots for *subexcisum* (= *latipes*) in our South East England area. However, three of these are due to misidentification, as detailed in Crosskey (1985b: 225-226).

Simulium (Nevermannia) angustitarse (Lundström)

Breeding site records

Bedfordshire: 258. Berkshire: 108. Buckinghamshire: 34, 42. East Sussex: 678, 692, 705, 745. Essex: 365, 389, 390, 392, 411, 742. Hampshire: 100, 122, 138, 139, 142. Hertfordshire: 265. Kent: 575, 597, 608, 615, 699, 741, 756, 757, 779, 780, 789, 790, 800. Northamptonshire: 19. Oxfordshire: 7, 92, 94, 123. Suffolk: 395, 408. Surrey: 570. West Sussex: 175, 523.

See Fig. 3D for 10km square basis.

Habitat and seasonality

This species breeds in various types of small streams, most often in agricultural country but occasionally also in undisturbed chalk-edge spring streams; it is rarely found in rivers but can be found sometimes in small rivers such as the Meon in Hampshire. According to our records, in South East England it is commonest in Kent. Larvae have been collected in all months from February to October so *S. angustitarse* is presumably therefore multivoltine. Pupae were collected on dates from 19 March to 23 October, but we have only larval records for July and September.

Simulium (Nevermannia) lundstromi (Enderlein)

Breeding site records

Berkshire: 91, 113. Buckinghamshire: 32, 33, 37, 65, 211, 224, 244. Buckinghamshire/Hertfordshire: 427. Buckinghamshire/Northamptonshire: 23. Buckinghamshire/Oxfordshire: 43. East Sussex: 694, 701, 715, 731. Essex: 343, 352. Essex/Hertfordshire: 318, 328. Hampshire: 100, 138, 141. Hertfordshire: 314, 317. Kent: 641, 741, 743, 754, 762, 765, 768, 769, 776, 784, 787, 795, 796, 797. Northamptonshire: 18. Oxfordshire: 13, 26, 137. Suffolk: 402. West Sussex: 165, 166, 220, 230, 446.

See Fig. 3E for 10km square basis.

Habitat and seasonality

Simulium lundstromi is a widespread and mainly riverine species, which often occurs sympatrically with other riverine species such as *S. equinum* and *S. erythrocephalum*, though at much lower population densities; occurrence in smaller streams, however, is not infrequent. Evidently, from the fact that larvae have been found in South East England from March to October (and also January) it is multivoltine. Pupae were collected in all months from spring to early autumn on dates from 26 March to 18 October.

Remarks

This is the species referred to by Davies (1966, 1968) as *S. angustitarse* (identification error) and also as *S. latigonium* (Rubtsov). Bass *et al.* (1995) have dealt with the matter and established the junior synonymy of *latigonium* with *lundstromi*.

Simulium (Nevermannia) armoricanum Doby & David

Breeding site records

East Sussex: 561, 576.

See Fig. 3F for 10km square basis.

Habitat and seasonality

This species is known from two nearby localities in South East England, both of which are undisturbed and permanently-flowing acid 'ghyll' streams in the East Sussex Weald. The immatures attach to pebbles and trailing ivy (*Hedera helix*) in small swift stony runs. Site 561 is heavily shaded but Site 576, on the edge of Ashdown Forest, more open. The East Sussex population seems to be univoltine; its early stages have not been found at any inspection of the sites later than mid May. Pupae were collected on dates from 18 April to 9 May. If univoltinism is confirmed it will be a generational difference from the closely related *S. cryophilum* complex which occurs in similar East Sussex streams, but which (from pupation dates) is presumed to be multivoltine.

Remarks

Discovery of *S. armoricanum* in South East England is most unexpected. Like *Prosimulium tomosvaryi*, also occurring in the Weald of East Sussex, it is primarily a species of moorland Britain and its nearest neighbour area of distribution is Dartmoor in Devonshire, where it is quite common. In the south-west it occurs also in Cornwall, where it was first found by Doby and Saguez (1963) during a cross-Channel collecting trip from their base at Rennes in Brittany. The species is closely related to the *S. cryophilum* complex but differs most evidently in the pupal stage, the gill having a long common stalk and the cocoon rather a lumpy structure.

Simulium (Nevermannia) cryophilum (Rubtsov) (complex)

Breeding site records

Sibling species 'A' - East Sussex: 670.

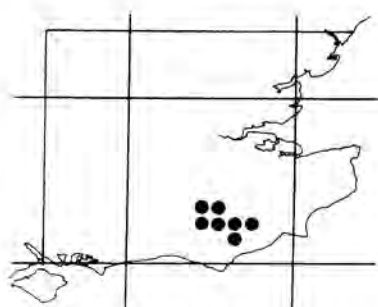
'Typical form' of Bass (1998) (probably sibling 'A') - East Sussex: 558, 562, 576, 578, 591, 598, 611, 613, 624, 625, 647, 649, 651, 654, 655, 664, 670, 671, 682, 691, 692, 693, 706. East Sussex/West Sussex: 547. Hampshire: 181. Kent: 627, 688. Surrey: 204, 466, 470, 472, 486. West Sussex: 191, 196, 219, 248, 544.

'Atypical form' of Bass (1998) - East Sussex: 562, 644, 693. Surrey: 204, 470, 472, 474, 486. West Sussex: 206, 207, 219, 229, 248, 416.

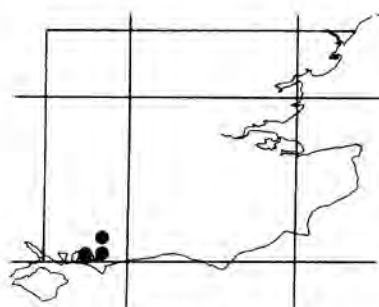
Unplaceable to form (only larvae in sample) - East Sussex: 561, 593, 606, 657, 668, 671, 707. Hampshire: 192. Kent: 697.

See Fig. 4A for 10km square basis.

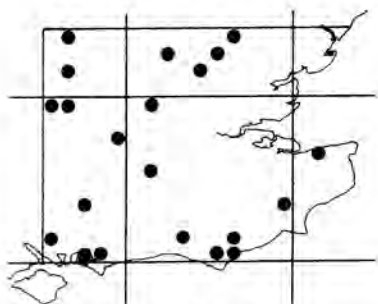
Fig. 3. Distribution data summarized on 10km square recording basis for: A, *Prosimulium tomosvaryi*; B, *Metacnephia amphora*; C, *Simulium latipes*; D, *Simulium angustitarse*; E, *Simulium lundstromi*; F, *Simulium armoricanum*.



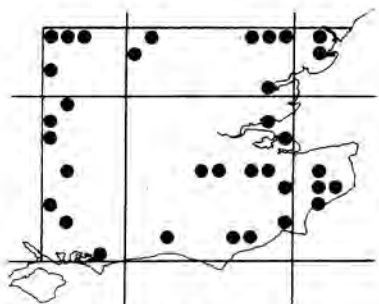
A. *Prosimulium tomosvaryi*



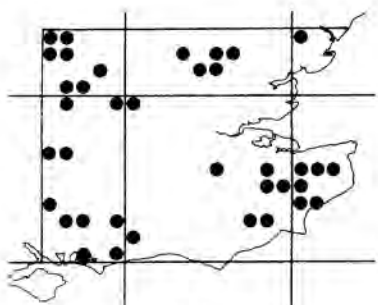
B. *Metacnephia amphora*



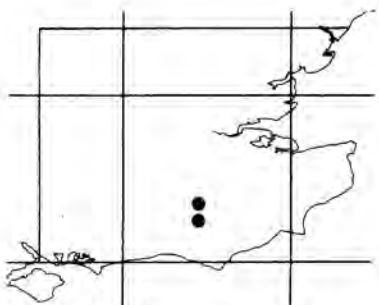
C. *Simulium latipes*



D. *Simulium angustitarse*

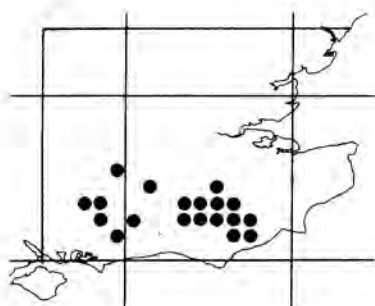


E. *Simulium lundstromi*

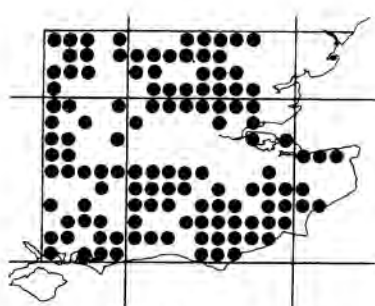


F. *Simulium armoricanum*

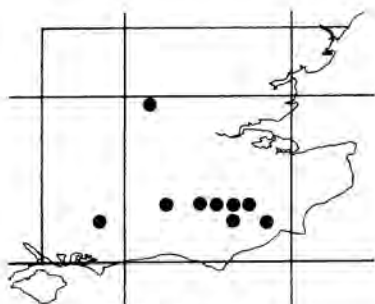
RWC



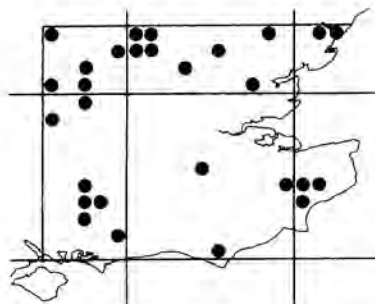
A. *Simulium cryophilum* (complex)



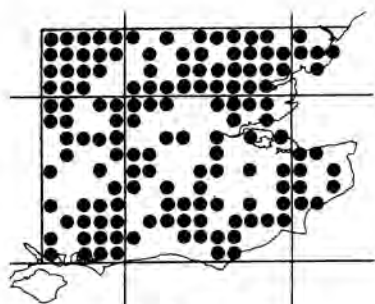
B. *Simulium vernum* (complex)



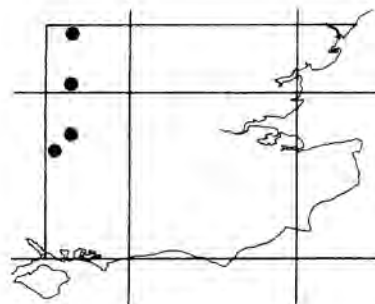
C. *Simulium urbanum*



D. *Simulium costatum*



E. *Simulium angustipes*



F. *Simulium lineatum*

RWC

Habitat and seasonality

This morphospecies in South East England has a Wealden and circum-Wealden distribution centred on East and West Sussex. The habitat is mainly small acid streams that flow perennially on sandy or clay soils; we have never found breeding sites in watercourses large enough to constitute named rivers or in chalk spring streams. Pupae were collected in all months from February to November, a date range supporting the supposition of Bass (1998) that there are two or three annual generations. There is perhaps no seasonal difference between the 'Typical' and 'Atypical' forms, pupae of both are present in our earliest-collected sample (February 8 at Site 472, a stream at Friday Street near Abinger in Surrey) and have been found together at some sites at least until mid-June; however, pupae of the 'Typical' form have been collected as late as 10 November (Site 547).

Remarks

The pupal gill shows some variation and Bass (1998) referred to 'Typical' and 'Atypical' *cryophilum* according to whether, respectively, the four pupal gill filaments lie close together along their length or diverge from one another near the base (often with the lowermost filament curving downwards away from the others). It is not known whether the two configurations reflect different sibling species but this seems likely; *cryophilum* is known to be a complex of at least two siblings, termed 'A' and 'B' (Hunter 1987). So far only one item of cytological data is available for South East England. Larvae collected on 28.iv.1993 at Cox's Mill, East Sussex (Site 670, TQ 653203) have been identified by P.H. Adler (*pers. comm.*) as sibling 'A'; in our three samples from this locality collected in the April of 1982, 1991 and 1993 all pupae have gills of the 'Typical form' and it is probable that sibling 'A' equates to this form and not to the 'Atypical' form.

Simulium (Nevermannia) vernum Macquart (complex)

Breeding site records

Bedfordshire: 79, 258. Berkshire: 93, 104, 114, 120, 217, 228, 237. Buckinghamshire: 34, 38, 40, 41, 42, 47, 49, 52, 74, 164, 211, 428. East Sussex: 552, 576, 578, 586, 591, 592, 601, 606, 611, 624, 625, 632, 642, 647, 648, 649, 650, 651, 653, 663, 664, 665, 671, 678, 684, 691, 693, 705, 706, 709, 730, 732, 736, 739, 745, 747. Essex: 320, 322, 323, 324, 325, 327, 333, 334, 335, 336, 337, 340, 341, 342, 347, 348, 350, 353, 363, 365, 368, 370, 373, 563, 571, 580, 609, 621, 631, 639, 660, 681, 689, 695, 704, 716, 717. Essex/London: 652. Hampshire: 84, 88, 106, 107, 111, 117, 119, 131, 132, 141, 144, 147, 159, 161, 181. Hertfordshire: 261, 273, 274, 278, 279, 282, 286, 291, 293, 294, 295, 300, 301, 303, 305, 310, 313, 316, 321, 496. Kent: 575, 614, 696, 718, 722, 740, 741, 743, 746, 752, 753, 755, 756, 758, 761, 762, 763, 770, 772, 773, 776, 777, 778, 783, 785, 786, 788, 793. London: 447, 453, 483, 484, 485, 487, 511, 513, 524, 525, 612. Northamptonshire: 19. Oxfordshire: 3, 7, 15, 22, 24, 94, 98, 123, 137. Surrey: 178, 216, 246, 444, 452, 455, 460, 462, 465, 470, 505, 528, 532, 537, 548, 564. West Sussex: 155, 160, 176, 187, 189, 191, 195, 199, 203, 206, 207, 226, 229, 238, 248, 416, 422, 438, 477, 498, 523.

Sibling standard 'Knebworth' - East Sussex - 642, 670. Hertfordshire: 282, 294.

See Fig. 4B for 10km square basis.

Fig. 4. Distribution data summarized on 10km square recording basis for: A, *Simulium cryophilum* (complex); B, *Simulium vernum* (complex); C, *Simulium urbanum*; D, *Simulium costatum*; E, *Simulium angustipes*; F, *Simulium lineatum*.

Habitat and seasonality

This morphospecies is abundant in South East England, breeding mainly in summer-drying streams, typically those partly or mainly shaded. A common habitat is small streams in oak woods and hazel coppices, but breeding sites can be found at times in heathland and chalk-fed streams. Its emergence time is strongly seasonal and the specific epithet '*vernum*' appropriate. Pupae were collected in all months from March to July (except no record for June in the data), the earliest on 15 March and the latest on 28 July. This suggests a single generation emerging through spring into early summer.

Remarks

It is well established that *Simulium vernum* is a species-complex with at least four cytoforms in Britain, each of them presumed to be a sibling species (Brockhouse 1985). One of these, 'Dorset IIs-2+3', conforms to *Simulium (Nevermannia) naturale* Davies, and has not so far been found in South East England; the 'Lymington' sibling has also not been found in this area. The 'Knebworth' sibling, the chromosomal standard for the *vernum* complex, was first identified in larvae from a tiny bog seepage rill near Knebworth in Hertfordshire (TL 218208), these larvae having been collected by RWC on 23.iii.1981. The same cytoform has been identified in our material from a stream near Cuffley, Hertfordshire (TL 297044) and a stream in East Sussex (TQ 562087) (Brockhouse 1985) and Brockhouse (*in litt.* to Bass, 1985) has identified it from Woolbeding Common in West Sussex (our Site 191). *Simulium vernum* complex larvae collected by Bass and Brockhouse (*pers. comm.*) on 23.iv.1985 at the Lavant in West Sussex (our Site 189) were a mixture of siblings 'Knebworth' and 'Dorset IIs-1'; the latter sibling is apparently most associated with weedy chalk streams and apart from being present in the Lavant is probably also the sibling involved in our Site 160 on the Ems, another chalk winterbourne.

Simulium (Nevermannia) urbanum Davies

Breeding site records

East Sussex: 559, 561, 647, 670, 732. Kent: 676, 697. London: 483, 484, 485. Surrey: 526. West Sussex: 191.

See Fig. 4C for 10km square basis.

Habitat and seasonality

In South East England the immatures of this rare species are mainly found in tiny ditch-like seepage rills which dry up in late spring and run again in winter. The rills are usually rather acidic and found principally in openly wooded heathland. Living in such temporarily-flowing habitats the species is evidently univoltine. Pupae were collected in the three months from March to May, the earliest on 13 March and the latest on 9 May.

Remarks

Site 484 listed above is the type locality of this species, Stanmore Common on the north-west edge of London. The species was first found at this locality on 27.iv.1963 by R.W. Dunbar, and we have confirmed its continuing presence by means of nine samplings made between 1971 and 1993. Davies (1966) gave the grid reference as TQ 156939 but we think that TQ 157940 is slightly more accurate to the 100-metre level and use this grid reference for our material. *Simulium urbanum* has recently been found in Germany (Seitz 1992) and is currently considered to equate with *cryophilum* 'B1', a cytoform described by Hunter (1987) as a subdivision of her *cryophilum* sibling 'B'.

Simulium (Nevermannia) costatum Friederichs

Breeding site records

Bedfordshire: 83, 258, 264. Buckinghamshire: 56, 59. East Sussex: 648. Essex: 342, 370, 373, 380, 388. Essex/Hertfordshire: 328. Hampshire: 150, 151, 152, 154, 163, 192. Hertfordshire: 265, 266, 299. Kent: 579, 597, 757, 763, 766, 780. Northamptonshire: 19. Oxfordshire: 17, 94, 143. Suffolk: 408, 413. Surrey: 565. West Sussex: 242.

See Fig. 4D for 10km square basis.

Habitat and seasonality

The breeding sites of *S. costatum* are closely associated with permanently running streams that issue from springs in limestone country. In South East England, where limestone is represented by the Chalk, the early stages are found close to the spring-heads (within 200 metres or so), often in company with those of *S. trifasciatum* which occupy the same ecological niche. Many of the located breeding sites are associated with spring-lines on scarp slopes of the chalklands, particularly on the north facing sides of the Chilterns and South Downs and the south facing side of the North Downs. Usually a breeding site has some woodland or scrub cover. Pupae were collected in all months from March to October (excluding August), the earliest on 19 March and the latest on 26 October.

Remarks

We have kept under occasional observation from 1961 to 2000 a spring-fed woodland chalk stream at Hexton in Hertfordshire (Site 265, TL 103306) because it is a reliable source of material for anyone wishing to study *S. costatum*; on 7.v.1984 it was in fact a source from which we were able to supply Carnoy-fixed larvae for chromosomal study by Hunter (1987) and Brockhouse *et al.* (1989a, 1989b). B-chromosomes are characteristic and there is a very close cytophylogenetic relationship between *S. costatum* and the *S. vernum* standard ('Knebworth' sibling); chromosome banding patterns are homosequential but *costatum*, unlike 'Knebworth', is chromocentric.

Simulium (Eusimulium) angustipes Edwards

Breeding site records

Bedfordshire: 76, 79, 254, 281. Berkshire: 129, 156, 194, 237. Buckinghamshire: 32, 35, 37, 38, 39, 40, 41, 46, 47, 49, 50, 52, 54, 57, 58, 63, 64, 65, 71, 73, 193, 211, 224, 244, 419, 421. Buckinghamshire/Oxfordshire: 31, 43. East Sussex: 542, 543, 546, 558, 572, 581, 587, 628, 632, 642, 646, 663, 678, 679, 686, 694, 702, 731, 745, 747. East Sussex/Kent: 610. Essex: 320, 325, 326, 327, 331, 335, 341, 343, 344, 345, 348, 349, 351, 352, 354, 355, 359, 363, 364, 365, 366, 367, 369, 371, 372, 375, 378, 379, 381, 383, 384, 389, 394, 397, 398, 403, 404, 405, 407, 411, 412, 609, 644, 659, 680, 704, 734, 742. Essex/Hertfordshire: 318. Hampshire: 88, 99, 100, 106, 111, 138, 141, 147, 159, 173, 181. Hampshire/Surrey: 188. Hertfordshire: 68, 260, 270, 272, 273, 274, 275, 279, 285, 292, 312, 314, 317, 321, 469. Kent: 575, 584, 597, 608, 615, 629, 636, 638, 718, 719, 720, 726, 744, 748, 749, 750, 752, 753, 754, 756, 763, 764, 765, 772, 773, 774, 775, 776, 784, 791, 797, 798, 799. Kent/Surrey: 573. London: 447, 456, 483, 501, 509, 522, 535. Northamptonshire: 2. Oxfordshire: 3, 7, 9, 10, 12, 13, 14, 16, 22, 24, 26, 94, 115, 123, 135, 137. Suffolk: 401, 402. Surrey: 214, 232, 420, 425, 436, 443, 468, 479, 481, 492, 505, 517, 533. West Sussex: 155, 166, 172, 176, 186, 202, 206, 220, 222, 230, 241, 446, 459, 490, 516, 527, 531, 555. Uncertain record: Buckinghamshire: 225 (see remarks).

See Fig. 4E for 10km square basis.

Habitat and seasonality

When male genitalia are employed to confirm identity within the *aureum* group it becomes certain that this species (cytoform 'E' of cytologists) truly does breed in diverse lotic habitats from drainage ditches, small seasonal and perennial streams, large streams and rivers, even

occurring (in West Sussex) near the source of chalk winterbournes. The species is particularly common in open areas under agriculture (notably in Essex) and rather less abundant in areas of undisturbed woodland. Pupae were collected in all months from spring to mid-autumn, the earliest on 14 March and the latest on 30 October.

Remarks

With only a single exception (*Simulium aureum sensu stricto* from Site 207), all samples of the *aureum*-group in our material are identifiable as *S. angustipes*, a species abundant in lowland England; however, there is some uncertainty about the sample from Burnham Beeches (Site 225, SU 949844) in which some of the three pupae and 32 larvae show a resemblance to *S. aureum*. The genitalia of pharate or reared males have been slide-mounted for the 36 sites where the male is available and all found to be *S. angustipes*. Where only immature pupae and/or larvae are available the identifications conform to the characters given by Bass (1998), see under *S. aureum* below.

Simulium angustipes is *aureum*-group chromosomal sibling 'E' and presence of this sibling has recently been cytologically confirmed (Adler *pers. comm.*) for larvae from our Site 628 in East Sussex.

It is possible, but so far we have no evidence, that the third British species of the *aureum*-group, *Simulium velutinum* (Santos Abreu), occurs here and there in South East England - especially as it is known from Dorset. It is the sibling 'I' of cytologists, and was recorded as such from 'London' (no other data) by Leonhardt (1985) on the basis of faded polytene chromosome preparations made by R.W. Dunbar in 1964.

Simulium (Eusimulium) aureum Fries

Breeding site records

West Sussex: 207.

[10km square not figured for single record]

Habitat and seasonality

Bass (1998) noted that this species occurs in very small low-pH streams, on moorland and rather open heathlands. This precisely fits the habitat at Ambersham Common near Midhurst (Site 207), the only place where we have found *S. aureum* in our survey area. We have no data on seasonality as the site was visited only once (16.vi.1974) but think the species is at least bivoltine as elsewhere pupae are present in the streams from May to September (Davies 1966).

Remarks

Simulium aureum sensu stricto occurs mainly in western and northern (upland) Britain and occurs in lowland England only as a few isolated populations, notably in heathland areas of Dorset and the New Forest. However, our slide preparation of the genitalia of a reared male from Ambersham Common confirms that the species occurs also in West Sussex. Larvae and pupae of *S. aureum*, *S. angustipes* and *S. velutinum* are very alike but typically the former species can be distinguished as follows (Bass 1998): pupal gill with uppermost filament arching upwards rather evenly in *aureum*, abruptly angled not far from the base in *angustipes* and *velutinum*; cocoon texture coarse and slightly perforated in *aureum*, with finer and more evenly woven texture in *angustipes* and *velutinum*; larval postgenal cleft outline conspicuous and with sharp anterior corners in *aureum*, less clearly defined and with slightly rounded anterior corners in *angustipes* and *velutinum*. Our observations concur with those of Bass and apply to larvae and pupae of the *aureum*-group.

Leonhardt (1985) identified sibling 'F' (= *aureum sensu stricto*) from Stanmore Common (London) on the basis of some larvae collected by R.W. Dunbar in 1964, but our only *aureum*-

group sample from here (Site 483) is of *S. angustipes*, as confirmed by slide preparation of the male genitalia.

***Simulium (Wilhelmia) lineatum* (Meigen)**

Breeding site records

Berkshire: 97, 109, 130. Buckinghamshire: 33. Oxfordshire: 27.

See Fig. 4F for 10km square basis.

Habitat and seasonality

The habitat is mainly the clear water of larger lowland rivers with steady current, but *S. lineatum* can at times be found in rivers that are hardly more than large streams. Pupae were found only in June and July, but this was as a consequence of limited sampling in the restricted part of South East England where the species occurs; typically pupae can be found over much of the year (Ladle *et al.* 1977 recorded up to four annual generations and pupae were present from March to November in the river Frome, Dorset).

Remarks

Simulium lineatum is pre-eminently a species of the English Midlands and is almost entirely absent from South East England. We have found it only in the rivers Kennet, Thame and Great Ouse (10km squares SU 56, SU 66, SP 60 and SP 63) at the northwestern edge of our sampling area, towards the Midlands; Davies (record cards) found it in the Kennet (SU 56) and also in the Pang, a small river in the same general area of Berkshire (SU 57). The complete absence of the species from South East England proper is remarkable. *Simulium lineatum* occurs in other parts of Britain, almost always completely mixed together in the riverine breeding sites with *S. equinum* - but not in Hertfordshire, Essex, London, Surrey, East and West Sussex and Kent, where *S. equinum* is everywhere abundant in many rivers apparently perfectly suitable for *S. lineatum* but where that species is absent. The absence of *S. lineatum* (and also of *S. pseudequinum*, next species) but the presence by itself of *S. equinum* in these counties presents an ecological puzzle still awaiting an explanation.

***Simulium (Wilhelmia) pseudequinum* Séguy**

Breeding site records

Berkshire: 109, 121. Oxfordshire: 1, 26, 27.

See Fig. 5A for 10km square basis.

Habitat and seasonality

The aquatic habitat of this little-known species is exactly similar to that of *S. lineatum* and *S. equinum*, the two other British species of the subgenus *Wilhelmia*. All three often occur together and are inhabitants of lowland weedy rivers with a steady current. Seasonality has not been studied, partly because the species is rare and easily confused with *S. lineatum*, but *S. pseudequinum* is almost certainly multivoltine with pupation occurring probably from spring to late autumn; in our limited sampling in the narrow area of distribution in South East England we have collected pupae only in May, June and September.

Remarks

This mainly Mediterranean species was first recognized in the British fauna in 1973 when we found it breeding at Cuddesdon Mill on the river Thame in Oxfordshire (Crosskey 1981). Since then the species has been collected from the Cherwell River in Oxfordshire and the Kennet in Berkshire. The centre of distribution appears to lie in the southern Midlands, and, as with *S. lineatum*, all our sites are along the north-west edge of the South East England sampling area (in

SP 51, SP 60, SU 56, SU 66). At all these sites *S. pseudequinum* was found in small numbers intermixed with much larger populations of the closely related *S. equinum*.

***Simulium (Wilhelmia) equinum* (Linnaeus)**

Breeding site records

Berkshire: 97, 102, 109, 121, 127, 130, 146, 158. Berkshire/Hampshire: 90, 179. Buckinghamshire: 33, 69, 70, 71, 73, 244, 419, 430. Buckinghamshire/Hertfordshire: 427. Buckinghamshire/London: 437. Buckinghamshire/Oxfordshire: 36. East Sussex: 607, 623, 628, 637, 656, 666, 686, 694, 701, 702, 715. East Sussex/Kent: 610. Essex: 327, 339, 345, 349, 352, 359, 366, 372, 375, 382, 384, 385, 386, 393, 394, 398. Essex/Hertfordshire: 308, 311. Essex/London: 551. Essex/Suffolk: 400. Hampshire: 136, 148, 149, 153, 162, 174, 177. Hampshire/Surrey: 182. Hertfordshire: 269, 270, 272, 283, 292, 297, 298, 302, 312, 321, 432, 441, 469. Hertfordshire/London: 434. Kent: 616, 617, 619, 620, 629, 633, 636, 675, 696, 698, 751. London: 439. Oxfordshire: 1, 26, 27, 110, 112. Suffolk: 401, 402. Surrey: 197, 208, 213, 223, 245, 249, 250, 417, 435, 440, 445, 449, 461, 464, 475, 492, 508. West Sussex: 167, 185, 215, 235, 446, 448, 450, 451.

See Fig. 5B for 10km square basis.

Habitat and seasonality

Steadily-flowing permanent rivers are the habitat of *S. equinum*, a species abundant and widely distributed in lowland Britain. Of our 119 record sites for South East England only 8 were on watercourses too small to be named rivers, and these were large tributary streams. There are several annual generations (up to four in larger rivers: Bass 1998). Pupae were collected in all months from March to November, the earliest on 15 March and the latest on 15 November.

***Simulium (Boophthora) erythrocephalum* (De Geer)**

Breeding site records

Bedfordshire: 268, 281. Berkshire: 130, 146, 158, 171, 424. Berkshire/Hampshire: 179. Buckinghamshire: 37, 48, 50, 53, 65, 70, 71, 430. Buckinghamshire/London: 437. Buckinghamshire/Oxfordshire: 36, 43. East Sussex: 572, 574, 581, 623, 628, 637, 646, 694, 702, 715, 731. East Sussex/Kent: 610. Essex: 327, 339, 343, 345, 349, 352, 357, 359, 362, 366, 375, 384, 385, 386, 393, 394, 398, 622, 680. Essex/Hertfordshire: 308, 318. Essex/London: 551. Essex/Suffolk: 396, 400. Hampshire: 136, 169. Hertfordshire: 269, 270, 321, 469. Hertfordshire /London: 434. Kent: 619, 633, 698, 754, 764, 765, 787. London: 439. Oxfordshire: 1, 14, 26, 27, 110, 112, 115. Suffolk: 401, 402. Surrey: 213, 245, 250, 417, 425, 449, 458, 464. West Sussex: 215, 235, 448, 450, 451.

See Fig. 5C for 10km square basis.

Habitat and seasonality

This species occupies the same lowland riverine habitats as members of the subgenus *Wilhelmia*. Co-occurrence of *S. erythrocephalum* and *S. equinum* is very common in South East England; in our records these species were sympatric at 62 of the 92 *erythrocephalum* sites (67%). Pupae were collected in all months of the year from March to November (as also in *equinum*), the earliest on 29 March and the latest on 6 November. The species is multivoltine: Post (1983) recorded up to five annual generations in Norfolk.

Remarks

Simulium erythrocephalum often bites humans living near the larger rivers in South East England and is the only simuliid species in this area that does so with any frequency. Post

(1982) cited a record provided by RWC of flies biting in a garden at Harefield near the river Colne (TQ 050918).

***Simulium (Simulium) intermedium* Roubaud**

Breeding site records

East Sussex: 561, 572, 599, 602, 611. Kent: 673. West Sussex: 519.

See Fig. 5D for 10km square basis.

Habitat and seasonality

This species is mainly found in upland Britain and is rare in southern lowland England. We have found it only at a few sites, these in the eastern part of the Weald and including both river and small brook habitats. Because of its rarity in South East England our information on pupation times is patchy. In general, pupae of *S. intermedium* can be found from spring to autumn (Bass 1998); we have obtained pupae in late May, July, September and mid October, a scatter of emergence times suggesting that in South East England the species (as elsewhere) is multivoltine.

Remarks

We sometimes found *S. intermedium* in rivers, the Ouse in East Sussex (Site 572) being an example - for which the identification was verified by the shining black frons of reared females; our findings do not fully support the remark by Bass (1998) that in southern England the species is confined to streams that drain heathland. A sibling complex could be involved. Post (1979, 1980 as *nitidifrons*) recognized two cytoforms in England, termed *S. nitidifrons* (synonym) 'A' and 'B': Elstead (Surrey, SU 94) was one of the sites for 'A' (a cytoform known also from continental Europe and the Balearic Islands).

***Simulium (Simulium) ornatum* Meigen (complex)**

Breeding site records

Bedfordshire: 76, 78, 80, 81, 254, 255, 257, 259, 262, 268, 281. Berkshire: 102, 108, 113, 114, 121, 124, 127, 156, 194. Berkshire/Hampshire: 90, 179. Buckinghamshire: 28, 33, 35, 37, 45, 47, 48, 57, 58, 59, 61, 62, 64, 65, 66, 71, 72, 73, 74, 77, 193, 211, 224, 236, 240, 244, 419, 421, 423, 426, 428, 435. Buckinghamshire/Hertfordshire: 427. Buckinghamshire/Northamptonshire: 23. East Sussex: 542, 546, 549, 562, 568, 572, 574, 576, 581, 582, 587, 602, 606, 607, 611, 618, 623, 625, 628, 635, 637, 642, 645, 646, 651, 653, 654, 656, 657, 663, 666, 668, 670, 674, 678, 679, 682, 684, 685, 686, 692, 693, 694, 700, 701, 702, 710, 713, 715, 721, 723, 731. East Sussex/Kent: 610, 662. Essex: 320, 323, 325, 326, 327, 329, 330, 331, 333, 334, 339, 341, 343, 344, 345, 346, 348, 349, 350, 351, 352, 354, 356, 358, 359, 360, 361, 364, 365, 366, 367, 369, 372, 374, 375, 377, 378, 379, 382, 387, 390, 391, 392, 393, 394, 397, 398, 399, 412, 590, 609, 622, 626, 634, 659, 681, 734, 742. Essex/Hertfordshire: 318, 328. Essex/London: 652. Hampshire: 84, 86, 87, 88, 89, 95, 96, 99, 100, 101, 105, 106, 107, 111, 116, 117, 118, 119, 122, 125, 128, 131, 132, 134, 136, 138, 139, 142, 145, 148, 149, 150, 153, 157, 162, 169, 173, 174, 177, 181, 183. Hampshire/Surrey: 182, 188. Hertfordshire: 253, 256, 261, 269, 270, 271, 272, 274, 275, 276, 277, 278, 279, 280, 283, 284, 285, 287, 288, 289, 292, 297, 298, 300, 302, 304, 306, 307, 309, 310, 312, 313, 314, 315, 317, 321, 432, 441, 507. Kent: 575, 579, 585, 594, 596, 603, 604, 608, 616, 617, 619, 620, 629, 630, 633, 636, 638, 640, 641, 658, 661, 667, 669, 673, 675, 677, 696, 699, 703, 708, 711, 714, 719, 720, 722, 733, 735, 738, 741, 743, 744, 748, 751, 754, 757, 760, 763, 764, 765, 768, 769, 771, 773, 774, 775, 776, 778, 781, 784, 787, 792, 793, 794, 795, 796, 797, 800. Kent/Surrey: 573. London: 296, 501, 509, 512, 513, 518, 520, 522, 595, 600. Northamptonshire: 2, 5, 18. Oxfordshire: 1, 4, 7, 8, 9, 11, 12, 13, 16, 24, 26, 29, 44, 51, 94, 110, 115, 123, 126, 133, 137. Suffolk: 395, 401, 402, 406, 408. Surrey: 190, 197, 198,

204, 210, 214, 218, 221, 227, 231, 232, 243, 245, 246, 249, 250, 252, 313, 415, 420, 429, 440, 442, 449, 457, 462, 467, 468, 475, 480, 482, 491, 493, 494, 495, 499, 502, 504, 506, 508, 510, 530, 534, 548, 553, 556, 557, 560, 566, 569. West Sussex: 160, 165, 166, 167, 172, 176, 180, 185, 186, 187, 189, 200, 201, 202, 205, 215, 219, 220, 222, 230, 235, 241, 446, 448, 450, 451, 476, 489, 490, 516, 519, 531, 536, 539, 541, 544, 550, 555.

See Fig. 5E for 10km square basis.

Habitat and seasonality

Almost any kind of running water is occupied by the *S. ornatum* complex in South East England (as elsewhere). The habitats include drainage ditches, small brooks, large streams and rivers, and streams fed from chalk aquifers, bogs and lakes; larvae and pharate pupae were once found on moss accumulated at the orifice of a pipe carrying water from a pond below a chalk escarpment (Site 703). In some populations the pupal cocoon is much more loosely woven than usual (resembling that of *intermedium*) but there is no obvious relation of this condition to habitat type. Pupae were collected all months of the year except December and January, the earliest on 8 February and the latest on 10 November.

Remarks

Post (1979, 1980) recognized four cytoforms, 'A', 'B', 'C' and 'E' among morphological *S. ornatum* in Britain but their exact status remains uncertain. The varied aquatic habitats occupied by the complex suggests the existence of separate sibling species each with own ecological preference. Cytoforms 'A' and 'C' are not known from South East England but cytoforms 'B' and 'E' were found from the river Wey (Surrey, SU 94), 'E' also nearby at Elstead (Surrey, SU 94), and cytoform 'B' (with *trifasciatum*) at Little Kimble (Buckinghamshire, SP 8206). The last locality is our Site 61 from which we also record *ornatum sensu lato*.

Simulium (Simulium) trifasciatum Curtis

Breeding site records

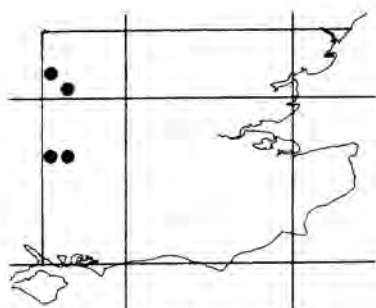
Bedfordshire: 263, 264. Bedfordshire/Hertfordshire: 82, 267. Berkshire: 103, Buckinghamshire: 59, 60, 61, 164. Buckinghamshire/Oxfordshire: 55. East Sussex: 545, 648, 674, 727, 729. Essex: 342, 380, 388, 639. Hampshire: 85, 140, 151, 154, 163. Hertfordshire: 265, 266, 274, 290. Kent: 575, 588, 589, 597, 615, 683, 687, 712, 725, 728, 737, 757, 759, 766, 767, 779, 780, 789. Northamptonshire: 6, 19. Oxfordshire: 17, 21, 137, 143. Suffolk: 413. Surrey: 204, 554, 565, 570. West Sussex: 160, 170, 233, 234, 242, 414, 459, 478, 515.

See Fig. 5F for 10km square basis.

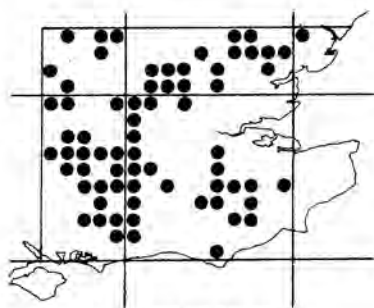
Habitat and seasonality

This species has a marked predilection for small spring-fed streams from limestone and in South East England is quite common around the edges of chalk formations, particularly within 200 metres of the source; exceptionally we have found it in small rivers such as the Len (Kent) and Pang (Berkshire), once in the Dudwell in the East Sussex Weald. Pupae were collected in all months (except August) from March to November, the earliest on 4 March and the latest on 10 November (which is also our latest date for collection of *S. ornatum* complex pupae). There are evidently several annual generations.

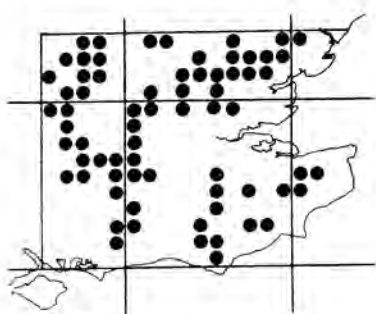
Fig. 5. Distribution data summarized on 10km square recording basis for: A, *Simulium pseudoequinum*; B, *Simulium equinum*; C, *Simulium erythrocephalum*; D, *Simulium intermedium*; E, *Simulium ornatum* (complex); F, *Simulium trifasciatum*.



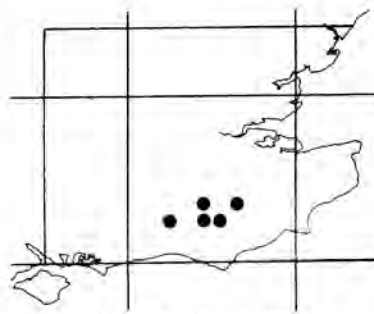
A. *Simulium pseudequinum*



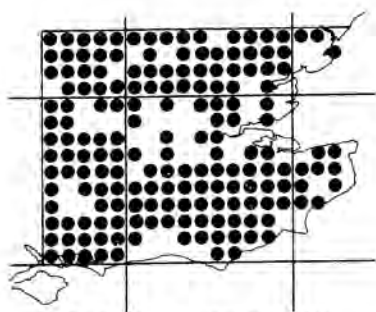
B. *Simulium equinum*



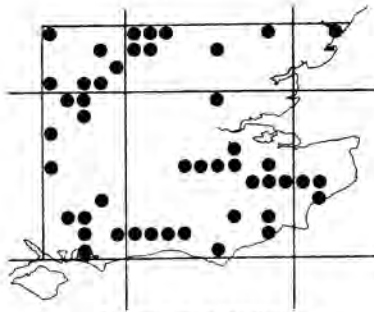
C. *Simulium erythrocephalum*



D. *Simulium intermedium*

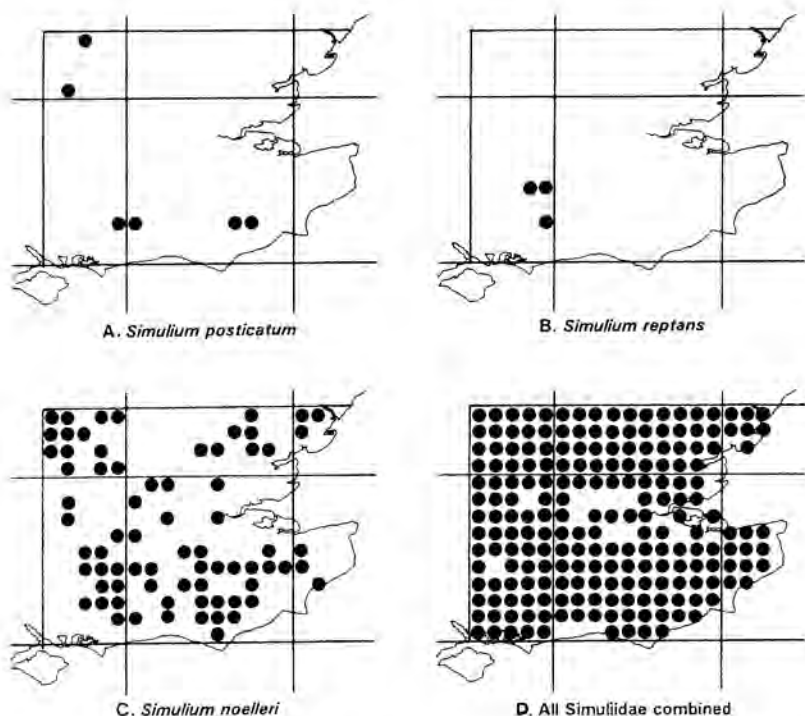


E. *Simulium ornatum* (complex)



F. *Simulium trifasciatum*

RWC



RWC

Fig. 6. Distribution data summarized on 10km square recording basis for: A, *Simulium posticatum*; B, *Simulium reptans*; C, *Simulium noelleri*; D, all species and complexes of Simuliidae combined (i.e. situation map for the family).

Remarks

Post (1979, 1980 as *spinosum*) studied this species chromosomally, partly on the basis of specimens collected in South East England at Thursley (Surrey, SU 896397) and in chalk spring streams at Bignor (West Sussex, SU 983149) and Little Kimble (Buckinghamshire, SP 826072). These locations correspond respectively to our *S. trifasciatum* Sites 204, 242 and 61 listed above.

Simulium (Simulium) posticatum Meigen

Breeding site records

Buckinghamshire: 45. East Sussex: 674, 701. Oxfordshire: 30. West Sussex: 215, 431, 448.

See Fig. 6A for 10km square basis.

Habitat and seasonality

In southern England, as elsewhere, this species breeds in gently-flowing rivers, often together in company with other riverine simuliids such as *S. equinum* and *S. ornatum* complex. It is certainly univoltine (Bass 1998). Pupae were collected in April and May, the earliest on 25 April and the latest on 17 May, these dates indicating a very short period of adult fly emergence in spring and early summer.

Remarks

Simulium posticatum has a curiously uneven distribution in lowland England. It has not been found in Norfolk (Post 1981), is rather uncommon in South East England, occurs commonly in the southern Midlands, and is found in east Dorset - where it has acquired the status of bloodsucking pest on humans and the moniker of 'Blandford Fly'. Williams (1991) reported it as common around Oxford. Cloudsley-Thompson (1955, as '*venustum*') recorded the species man-biting in Surrey, but there are no other reports of anthrophily for South East England, though it bites horses near the Arun river (West Sussex). Our records are few, from only seven 10km squares. There are, however, three more squares for which there are modern records in South East England: the Davies cards have a record for TQ 54, spot-marked on the Davies (1968: 117) map for *S. austent* (synonym) and relating to the River Medway near Tonbridge (Kent); Williams (1991) recorded *S. posticatum* from SP 51 relating to the Cherwell River and SU59 relating to the Thame. We have not found the species in our sampling areas north of the Thames but the BMNH collection contains old specimens collected by F.W. Edwards at Letchworth (Hertfordshire) in 1917 and by H. Leeson at Epping Forest (Essex) in 1928. The oviposition habit is unique, gravid females entering soil crevices above the waterline to lay their eggs (Ladle *et al.* 1985); scarcity of suitable riverbanks perhaps explains the patchy distribution of *S. posticatum* in England.

Simulium (Simulium) reptans (Linnaeus)

Breeding site records

Surrey: 197, 213, 223, 249. West Sussex: 215.

See Fig. 6B for 10km square basis.

Habitat and seasonality

In England *S. reptans* is primarily a species of the north and west, breeding in large streams and rivers in the wider valleys of upland areas. Its discovery in Surrey and West Sussex, widely disjunct from the general range, is unexpected but perhaps ecologically explicable inasmuch as the breeding sites we have found in the Wey and Rother are shallow stony riffles (an unusual physical feature in South East England rivers) much resembling the riffle habitats where *S. reptans* breeds in the Yorkshire dales. Pupae were collected only in May and June (earliest 15 May and latest 16 June) but are probably present in the rivers for a much longer period; there are likely to be two or three annual generations, as elsewhere (Bass 1998).

Remarks

Edwards (1920) proposed the name *galeratum* for a 'variety' of *S. reptans* in which the larva, instead of having an almost unpigmented head plate, has a large dark-pigmented mark covering the whole central part of this sclerite. This variety was recognized as such by Davies (1966), although after 1960 a variety has in fact no status in nomenclature (although varietal names proposed before that date are available). Some continental authors have recognized *S. galeratum* as a separate valid species from *reptans*, but we take the view that as this is so far unsubstantiated by a chromosomal study it is preferable *pro tempore* to regard the name *galeratum* as a synonym of *reptans*. Illustrations of the darkened head plate of '*galeratum*' are

in Edwards (1920: Fig. 1e) and Davies (1968, Fig. 16b, part). Larvae from our *S. reptans* sites are all of 'galeratum' type and our samples will need to be re-identified as *S. galeratum* should specific validity be proved for this enigmatic taxon.

***Simulium (Simulium) noelleri* Friederichs**

Breeding site records

Buckinghamshire: 35, 38, 46, 63, 67, 69, 75, 77, 418, 428. East Sussex: 572, 574, 577, 587, 602, 628, 637, 643, 650, 651, 672, 691, 693. East Sussex/Kent: 583. Essex: 332, 338, 349, 362, 371, 376, 383, 403, 622, 644. Essex/Suffolk: 400. Hampshire: 145, 162, 174, 181. Hampshire/Surrey: 184, 188. Hertfordshire: 319. Kent: 584, 604, 605, 617, 638, 690, 698, 714, 720, 722, 724, 725, 738, 754, 759, 769, 782. London: 488, 497, 514, 518, 529. Oxfordshire: 1, 16, 20, 25, 27, 115, 135. Suffolk: 409, 410. Surrey: 209, 212, 214, 232, 247, 251, 420, 433, 463, 471, 482, 538, 554. West Sussex: 165, 186, 206, 219, 222, 239, 241, 248, 454, 500, 503, 521, 540, 550.

See Fig. 6C for 10km square basis.

Habitat and seasonality

Breeding sites of *S. noelleri* are located where running water drops in a nearly vertical manner at outfalls from lakes and large ponds that impede the flow from inlet streams, and at river weirs and dams. In such man-made and spatially restricted habitats the larval and pupal populations are often astronomical for much of the year. In South East England, where there are very few natural lakes, the artificial lakes in the grounds of stately homes provide much of the habitat. Pupae were collected in all months from March to October, the earliest on 24 March and the latest on 18 October. As elsewhere, the species is undoubtedly multivoltine.

Remarks

The biology of *S. noelleri* has been much studied by R.S. Wotton at the outfall of Furnace Pond, Horsmonden, Kent (TQ 695413), our Site 690 which we first found on 15.ix.1974 and realised would make a perfect site for studies on this species. The larval densities reach 100 to the square centimetre (i.e. a million to the square metre) (Wotton 1985). Chromosomal information for populations in South East England is lacking except for the recent recognition of the newly designated *S. noelleri* cytotype 'A' from Site 628 on the Cuckmere River, East Sussex (Adler and Kachvorian 2001).

Acknowledgements

Our warm appreciation goes to our friend and colleague Dr Richard P. Lane, sometime Keeper of Entomology at The Natural History Museum, who counselled us to be sure that our data were not left unpublished; we thank him for providing the much-needed stimulus for us to prepare this work. Our thanks go also to Mr Jon A.B. Bass for providing us with some helpful background documentation, including the results of his special study in 1985 of our *S. cryophilum sensu lato* material, and to the several cytologists of the late Dr Klaus Rothfels' cytotoxic 'school' at the University of Toronto who supplied data on the larvae that from time to time we contributed towards their studies.

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Locality list and collection dates

Sampling sites in 100km square SP

1. 505138 - River Cherwell near Kidlington 2km W of Islip (Oxfordshire). 13.iv.78
2. 506363 - Stream at Kings Sutton 8km W of Brackley and 3km N of Aynho (Northamptonshire). 8.iv.78
3. 517180 - Stream 1.5km E of Blethingdon and 1.5km W of Weston-on-the-Green (Oxfordshire). 8.iv.78
4. 523217 - Gallos Brook 3km NE of Kirtlington and 6km W of Bicester town centre (Oxfordshire). 8.iv.78
5. 524324 - Stream 1km N of Souldern and 1km SE of Aynho (Northamptonshire). 29.ix.73
6. 527356 - Stream at Charlton 6km WSW of Brackley and 2.5km E of Kings Sutton (Northamptonshire). 29.ix.73
7. 528167 - Stream on Oxford to Bicester road 2km SSW of Weston-on-the-Green (Oxfordshire). 8.iv.78
8. 528184 - Stream at Weston-on-the-Green 7km SW of Bicester town centre (Oxfordshire). 8.iv.78
9. 529102 - Stream 1km W of Elsfield and 2km SSW of Wood Eaton (Oxfordshire). 29.ix.73
10. 534090 - Stream 1km E of Marston and 3.5km NE of Oxford city centre (Oxfordshire). 29.ix.73
11. 538235 - Gagle Brook near Middleton Stoney 4.5km W of Bicester town centre (Oxfordshire). 25.vii.75
12. 547283 - Stream 1km NNE of Ardley and 10km SSW of Brackley on road to Oxford (Oxfordshire). 8.iv.78
13. 559218 - Gagle Brook near Chesterton 2.5km WSW of Bicester (Oxfordshire). 29.ix.73
14. 566169 - Stream to River Ray near Charlton-on-Otmoor 1.5km SW of Merton (Oxfordshire). 29.ix.73
15. 568056 - Stream on Horspath Common 3km W of Wheatley and 1km N of Horspath (Oxfordshire). 1.iv.78
16. 577267 - Pond outlet stream at Bainton 4km N of Bicester town centre (Oxfordshire). 8.iv.78
17. 581095 - Spring stream at Stanton St John 4km NNW of Wheatley (Oxfordshire). 8.iv.78
18. 581366 - Stream on southern edge of Brackley 0.5km SW of town centre (Northamptonshire). 29.ix.73
19. 587346 - Spring stream at Evenley 2.5km S of Brackley town centre (Northamptonshire). 8.iv.78
20. 593310 - Lake outlet at Cottisford 6km S of Brackley town centre (Oxfordshire). 8.iv.78
21. 595025 - Stream at Denton 1.5km E of Garsington and 0.5km SW of Cuddesdon (Oxfordshire). 1.iv.78
22. 596013 - Stream to River Thame 2km SE of Garsington near Chippinghurst Manor (Oxfordshire). 1.iv.78

23. 599379 - River Great Ouse at Turveston near Brackley (Buckinghamshire/Northamptonshire). 29.ix.73
24. 601233 - Stream 2km E of Bicester town centre on minor road to Launton (Oxfordshire). 8.iv.78
25. 610262 - Lake outlet at Stratton Audley 4km NE of Bicester town centre (Oxfordshire). 13.v.78
26. 612028 - River Thame at Cuddesdon Mill 1.5km E of Cuddesdon (Oxfordshire). 22.ix.73, 29.ix.73, 1.vi.74, 12.vi.76, 21.vi.80
27. 612052 - River Thame 1.5km ESE of Wheatley and 2.5km NNE of Cuddesdon (Oxfordshire). 12.vi.75
28. 623132 - Danes Brook 3.5km W of Brill and 2km NW of Oakley (Buckinghamshire). 25.vii.75
29. 627284 - Stream 3km NE of Stratton Audley and 7km NE of Bicester town centre (Oxfordshire). 29.ix.73
30. 633056 - River Thame at Waterstock 3.5km E of Wheatley and 1km SE of Waterperry (Oxfordshire). 13.v.78
31. 637201 - River Ray 3km S of Marsh Gibbon near Bicester to Aylesbury road (Buckinghamshire/Oxfordshire). 29.ix.73
32. 646083 - Stream to River Thame at Worminghall 7km WNW of Thame (Buckinghamshire). 6.x.73
33. 647344 - River Great Ouse near Water Stratford 5km W of Buckingham town centre (Buckinghamshire). 28.vii.73
34. 654307 - Stream near Preston Bissett 2km S of Tingewick (Buckinghamshire). 24.iii.78
35. 667363 - Oxford Water outlet at Stowe Gardens 4km NW of Buckingham town centre (Buckinghamshire). 28.vii.73
36. 669065 - River Thame at Shabbington 4km W of Thame (Buckinghamshire/Oxfordshire). 25.vii.75
37. 672629 - River at Three Bridge Mill near Twyford 8km SW of Buckingham (Buckinghamshire). 6.x.73
38. 677173 - Stream to River Ray from The Lake 1.5km E of Ludgershall (Buckinghamshire). 24.iii.78
39. 687158 - Stream at Wotton Underwood 5.5km WSW of Waddesdon (Buckinghamshire). 6.x.73
40. 687377 - Stream near Akeley Wood School 3.5km NNW of Buckingham (Buckinghamshire). 24.iii.78
41. 696187 - Stream at Kingswood 5km WNW of Waddesdon on Aylesbury to Bicester road (Buckinghamshire). 24.iii.78
42. 702392 - Stream near Lillingstone Dayrell 5km N of Buckingham town centre (Buckinghamshire). 24.iii.78
43. 703064 - River Thame near Thame at crossing of road to Long Crendon (Buckinghamshire/Oxfordshire). 12.vi.76
44. 710046 - Cuttle Brook at Greys Mead 1km S of Thame on road to Stokenchurch (Oxfordshire). 25.vii.75
45. 711303 - River 1km SE of Padbury and 4.0m SSE of Buckingham town centre (Buckinghamshire). 13.v.78
46. 713257 - Lake outlet at Claydon House Park 1km W of Middle Claydon (Buckinghamshire). 24.iii.78
47. 714131 - Stream 1.5km SE of Ashendon and 5km SW of Waddesdon (Buckinghamshire). 24.iii.78
48. 715290 - Claydon Brook at White Bridge 5km SSE of Buckingham town centre (Buckinghamshire). 13.v.78
49. 724247 - Stream into Claydon House Park 1km W of Botolph Claydon (Buckinghamshire). 24.iii.78
50. 728113 - River Thame on Chearsley to Cuddington road 6km NNE of Thame (Buckinghamshire). 23.viii.73
51. 734002 - Chalk edge stream near Kingston Blount 2.5km WSW of Chinnor (Oxfordshire). 21.v.72
52. 736219 - Stream 2km NW of Quainton and 5km N of Waddesdon (Buckinghamshire). 24.iii.78
53. 738355 - River Great Ouse 4km ENF of Buckingham and 1.5km N of Thornborough (Buckinghamshire). 28.vii.73
54. 739340 - Stream at Thornborough 4km E of Buckingham town centre (Buckinghamshire). 28.vii.73
55. 769024 - Cuttle Brook 2km NE of Chinnor and 1km W of Bledlow (Buckinghamshire/Oxfordshire). 21.v.72
56. 773129 - Spring to River Thame near Stone and 5km W of Aylesbury town centre (Buckinghamshire). 24.iii.78
57. 776096 - Stream at Ford 6.5km SW of Aylesbury town centre and 2.5km S of Stone (Buckinghamshire). 23.vii.73
58. 776267 - Claydon Brook 1km SE of Winslow and 2.5km W of Swanbourne (Buckinghamshire). 28.vii.73
59. 796021 - Chalk edge stream at Saunderton 1.5km SW of Princes Risborough (Buckinghamshire). 21.v.72
60. 813284 - Spring stream at Mursley 8km SW of Bletchley town centre (Buckinghamshire). 24.iii.78
61. 826072 - Chalk edge stream at Little Kimble 4.5km W of Wendover (Buckinghamshire). 21.v.72
62. 828209 - Stream 1.5km SW of Cublington and 7.5km N of Aylesbury town centre (Buckinghamshire). 4.i.75
63. 845198 - Outlet stream from pond at Aston Abbots 7km NNE of Aylesbury town centre (Buckinghamshire). 24.iii.78
64. 845237 - Stream 1.5km NNE of Cublington and 2.5km SSW of Stewkley (Buckinghamshire). 24.iii.78
65. 846176 - River Thame at Rowsham Bridge 4.5km NE of Aylesbury town centre (Buckinghamshire). 4.i.75
66. 858097 - Lake outlet stream between Weston Turville and Wendover 1.5km W of Halton (Buckinghamshire). 21.v.72
67. 871075 - Chalk stream below pond at Wendover 8.5km SE of Aylesbury town centre (Buckinghamshire). 8.iv.78
68. 885168 - Stream 2.5km SE of Wingrave and 7km NW of Tring (Hertfordshire). 12.vi.76
69. 885309 - River Ouzel 3km S of Bletchley town centre and 1.5km N of Stoke Hammond (Buckinghamshire). 6.x.73
70. 895286 - River Ouzel 4km NW of Iinslade at crossing of Soulbury to Great Brickhill road (Buckinghamshire). 6.x.73
71. 896394 - Tributary of River Ouzel near old Milton Keynes village 1km S of Broughton (Buckinghamshire). 6.x.73
72. 905225 - Stream to River Ouzel 2.5km E of Wing and 3km S of Iinslade (Buckinghamshire). 4.i.75
73. 907389 - Tributary of River Ouzel at Kingstone Bridge 4km NW of Woburn Sands (Buckinghamshire). 6.x.73
74. 908319 - Stream 1.5km N of Great Brickhill and 4km ESE of Bletchley town centre (Buckinghamshire). 30.iv.77
75. 914333 - Stream from impounded pond on golf course 1km N of Little Brickhill (Buckinghamshire). 30.iv.77
76. 939327 - Stream at Pinfoldpond near Woburn on Leighton Buzzard to Woburn road (Bedfordshire). 30.iv.77
77. 956014 - River Chess source region near The Bury W side of Chesham town (Buckinghamshire). 11.xi.2001
78. 957286 - Lake outlet stream at Battlesden Park lake 2.5km NW of Hockliffe (Bedfordshire). 22.v.77
79. 962289 - Stream near Battlesden 2.5km WNW of Hockliffe and 1.5km SE of Pottsgrove (Bedfordshire). 22.v.77
80. 967266 - Stream near Hockliffe 7km NW of Dunstable town centre (Bedfordshire). 22.v.77
81. 975220 - Stream W of Dunstable at Lower End Totternhoe 1.5km NNE of Eaton Bray (Bedfordshire). 22.v.77
82. 985184 - Chalk stream on Dunstable to Ivinghoe road 3km W of Whipsnade (Bedfordshire/Hertfordshire). 4.iii.76
83. 997204 - Chalk spring stream at Well Head 2.5km SW of Dunstable town centre (Bedfordshire). 22.x.77

Sampling sites in 100km square SU

84. 503155 - Headstream of River Hamble 3km NNW of Botley and 3km S of Fair Oak (Hampshire). 25.iv.74
85. 503598 - Stream at Echinswell 2.5km WNW of Kingsclere (Hampshire). 20.x.73
86. 506497 - River Test 1km W of Overton and 5km ENE of Whitechurch (Hampshire). 20.x.73

87. 512325 - River Itchen at Easton 4.5km NE of Winchester city centre (Hampshire). 27.iv.75
88. 512394 - Chalk stream to River Test at Micheldever 5km E of Sutton Scotney (Hampshire). 27.iv.75
89. 517503 - River Test near source at Quidhampton 0.5km N of Overton (Hampshire). 20.x.73
90. 521639 - River Enborne on S side Crookham Common 5.5km N of Kingsclere (Berkshire/Hampshire). 20.x.73
91. 527663 - River Kennet at Thatcham railway Station 6km E of Newbury town centre (Berkshire). 19.6.76
92. 532860 - Mill Brook at source in Blewbury 4.5km S of Didcot (Oxfordshire). 29.ix.73
93. 536726 - River Pang 1km SW of Frilsham and 6km NNE of Thatcham (Berkshire). 12.iv.74
94. 536875 - Stream to Mill Brook 3.0km SSE of Didcot and 1.5km N of Blewbury (Oxfordshire). 22.ix.73, 12.iv.74
95. 535083 - River Meon 3km NNE of Titchfield and 3.5km NW of Fareham town centre (Hampshire). 25.iv.74
97. 555657 - River Kennet 2km SW of Woolhampton and 4km W of Aldermaston (Berkshire). 19.vi.76
98. 556974 - Woodland stream 4km NW of Dorchester and 2km NE of Clifton Hampden (Oxfordshire). 8.iv.78
99. 557181 - River Hamble headstream 1km N of Bishop's Waltham on road to Corhampton (Hampshire). 25.iv.74
100. 564346 - Stream to River Itchen at Abbotstone 3km NW of New Alresford (Hampshire). 22.viii.73
101. 570323 - River Itchen near New Alresford on road to Itchen Stoke (Hampshire). 22.viii.73
102. 570649 - River Enborne 2km W of Aldermaston and 1km E of Brimpton (Berkshire). 20.x.73
103. 571072 - River Pang 1km WSW of Stanford Dingley and 4.5km N of Woolhampton (Berkshire). 11.viii.73
104. 572691 - Stream in Carbin's Wood at Chapel Row 2.5km N of Woolhampton (Berkshire). 12.iv.74
105. 580296 - River Itchen near source between Titchborne and Cheriton (Hampshire). 22.viii.73
106. 587078 - River Wallington near Wallington 2km NE of Fareham town centre (Hampshire). 25.iv.74
107. 589141 - River Meon 3km NNE of Wickham and 2.5km SSE of Swanmore (Hampshire). 25.iv.74
108. 590720 - River Pang between Bradfield and Stanford Dingley (Berkshire). 11.viii.73
109. 593662 - River Kennet 1km N of Aldermaston and 2km E of Woolhampton (Berkshire). 19.vi.76
110. 594987 - River Thame at Chislehampton 1km WNW of Stadthampton (Oxfordshire). 22.ix.73
111. 599573 - Stream near Monk Sherborne 6.5km NW of Basingstoke town centre (Hampshire). 14.v.77
112. 601977 - River Thame 0.5km S of Stadthampton near road to Warborough (Oxfordshire). 22.ix.73
113. 603647 - Stream 1.5km SE of Aldermaston on road to Silchester (Berkshire). 14.v.77
114. 604702 - Stream to River Bourne 2.5km S of Bradfield and 4km W of Theale (Berkshire). 14.v.77
115. 604868 - Stream to River Thames 2.5km S of Wallingford and 1.5km E of Cholsey (Oxfordshire). 22.ix.73
116. 606322 - Stream below cross-bed at Bishop's Sutton 2.5km E of New Alresford (Hampshire). 23.x.72
117. 606583 - Stream near Panther End 2km N of Monk Sherborne and 3km S of Tadley (Hampshire). 14.v.77
118. 607092 - River Wallington 1km N of Boarhunt and 4.5km NE of Fareham town centre (Hampshire). 25.iv.74
119. 607170 - River Meon near Soberton 1.5km S of Droxford and 7km NE of Wickham (Hampshire). 25.iv.74
120. 612660 - Stream near Padworth 1.5km SE of Aldermaston Wharf (Berkshire). 14.v.77
121. 612671 - River Kennet 1km E of Aldermaston Wharf and 1km N of Padworth (Berkshire). 14.v.77
122. 616212 - River Meon at Exton 1.5km NE of Meonstoke and 2km SSW of Wornford (Hampshire). 23.x.72
123. 619947 - Stream at Berwick Prior near Berwick Salome 3km N of Benson (Oxfordshire). 1.iv.78
124. 623732 - Bourne tributary of River Pang 3.5km SSW of Pangbourne (Berkshire). 1.vi.74
125. 626084 - River Wallington at Southwick Priory 3km NNE of Portchester (Hampshire). 25.iv.74
126. 627921 - Stream beside road 1km ENE of Benson and 2km WNW of Ewelme (Oxfordshire). 22.ix.73
127. 636747 - River Pang at Tidmarsh 2km S of Pangbourne and 1km NW of Sulham (Berkshire). 11.viii.73
128. 638572 - Lake outlet stream at Vyne Park 5km N of Basingstoke town centre (Hampshire). 14.v.77
129. 643743 - Stream at Sulham 2.5km SSE of Pangbourne and 3km N of Theale (Berkshire). 11.viii.73
130. 646706 - River Kennet 2.5km NE of Sulhamstead near Theale (Berkshire). 19.vi.76
131. 653239 - River Meon at Fast End 1km E of West Meon and 3km ENE of Wornford (Hampshire). 27.iv.75
132. 656216 - Chalk stream at Whitewool 3km SE of West Meon and 2.5km W of East Meon (Hampshire). 27.iv.75
133. 660962 - Stream 1km NW of Cusham and 2.5km ESE of Chalgrove (Oxfordshire). 1.vi.78
134. 661528 - River Loddon near source at Basing 2.5km E of Basingstoke town centre (Hampshire). 20.x.73
135. 669767 - Old mill sluice by River Thames at Mapledurham 4km E of Pangbourne (Oxfordshire). 11.viii.73
136. 682584 - River Loddon at Sherfield on Loddon 8km NE of Basingstoke town centre (Hampshire). 20.vi.76
137. 684966 - Stream near Pyrlton 2.5km N of Watlington and 1.5km WNW of Shirburn (Oxfordshire). 7.v.72
138. 685215 - River Meon near East Meon 6.5km WSW of Petersfield (Hampshire). 13.vi.71
139. 688522 - Headstream of Lyde River 1km W of Up Nately (Hampshire). 20.x.73
140. 692212 - River Meon headstream 1.5km SE of East Meon (Hampshire). 30.iv.72
141. 692612 - Trickle into River Loddon near Stratfield Saye 2km WNW of Turgis Green (Hampshire). 23.iv.72
142. 694532 - River Lyde by Water End on Basingstoke to Hook road 1km NNW of Up Nately (Hampshire). 20.x.73
143. 713983 - Woodland stream 1km N of Lewknor and 5km NE of Watlington (Oxfordshire). 7.v.72
144. 715582 - Stream in wood 2km W of Mattingley and 2km ESE of Turgis Green (Hampshire). 23.iv.72
145. 716506 - Mill race source of River Whitewater at Greywell 2.5km W of Odiham (Hampshire). 15.ix.73
146. 716647 - River Loddon 1km W of Swallowfield and 9km S of Reading town centre (Berkshire). 20.vi.76
147. 720230 - Stream 2.5km W of Petersfield and 1.5km ESE of Langrish (Hampshire). 30.iv.72
148. 733522 - River Whitewater near North Warrborough on Hook to Odiham main road (Hampshire). 2.vi.75
149. 741634 - River Whitewater 5.5km N of Mattingley and 2km SE of Swallowfield (Berkshire/Hampshire). 23.iv.72
150. 743259 - Chalk stream near Steep 2.5km N of Petersfield town centre (Hampshire). 30.ix.72
151. 744330 - Spring source of Oakhanger Stream at Selborne on Alton to Liss road (Hampshire). 30.ix.94
152. 744333 - Oakhanger Stream near source at Selborne on Alton to Liss road (Hampshire). 23.x.72
153. 755417 - River Wey at Mill Court near Upper Froyle 5km NE of Alton (Hampshire). 15.ix.73
154. 756280 - Oakshott stream 2km W of Liss and 5km NNE of Petersfield town centre (Hampshire). 30.iv.72

155. 763088 - Lake outlet tributary of River Ems 1km NNE of Westbourne (West Sussex). 4.v.96
156. 766704 - Stream to River Loddon 1.5km W of Winnersh and 6km SE of Reading centre (Berkshire). 20.vi.76
157. 769261 - River Rother near Stadham Park 3.5km NE of Petersfield town centre (Hampshire). 15.vi.74
158. 770701 - River Loddon 1.5km SW of Winnersh and 7km SE of Reading town centre (Berkshire). 20.vi.76
159. 771347 - Stream near Oakhanger on Blackmoor road 2.5km SW of Bordon Camp (Hampshire). 30.iv.72
160. 773086 - River Ems 1.5km NE of Westbourne near Aldsworth (West Sussex). 22.iv.74, 25.iv.74, 27.iv.75, 30.iv.94
161. 774345 - Stream on Oakhanger Common near golf course 2km SW of Bordon Camp (Hampshire). 30.iv.72
162. 775428 - River Wey at Isington 7km NE of Alton and 2km SW of Bentley (Hampshire). 15.ix.73
163. 776406 - Spring stream 1km SE of Binsted and 6.5km ENE of Alton (Hampshire). 15.ix.73
164. 781881 - Stream at Colstrop 2km N of Hambledon and 6km NNE of Henley-on-Thames (Buckinghamshire). 7.v.72
165. 782221 - Outlet stream from Harting Pond 4km ESE of Petersfield (West Sussex). 15.vi.74
166. 783094 - River Ems 2km WNW of Funtington and 1.5km NE of Aldsworth (West Sussex). 25.iv.74, 27.iv.75
167. 783233 - River Rother 3.5km E of Petersfield and 2.5km W of Rogate (West Sussex). 15.vi.74
168. 784098 - River Ems 75 metres below source 1km SW of Walderton (West Sussex). 25.iv.74
169. 787568 - Headstream of River Hart near Elvetham 2.5km E of Hartley Wintney (Hampshire). 23.iv.72
170. 788196 - Chalk spring stream at South Harting 6km SE of Petersfield town centre (West Sussex). 16.vi.74
171. 788745 - River Loddon 1.5km S of Twyford and 7.5km E of Reading town centre (Berkshire). 20.iv.76
172. 790107 - Chalk winterbourne at Walderton 9.5km NW of Chichester city centre (West Sussex). 27.iv.75
173. 802383 - River Slea at Sleaford 1km E of Kingsley and 2km NNW of Lindford (Hampshire). 11.ix.76
174. 803443 - River Wey 1.5km E of Bentley and 5km SW of Farnham town centre (Hampshire). 15.ix.73
175. 805077 - Ditch-stream 0.75km SE of Funtington on road to West Ashling (West Sussex). 27.iv.75
176. 807075 - Stream at West Ashling 6km WNW of Chichester city centre (West Sussex). 27.iv.75
177. 817386 - River Wey 2.5km NNW of Headley and 2.5km NNE of Lindford (Hampshire). 26.vii.71
178. 825468 - Stream 2km W of Farnham town centre on road to South Warnborough (Surrey). 15.v.76
179. 826615 - River Blackwater at bridge between Yateley and Sandhurst (Berkshire/Hampshire). 3.vi.2001
180. 827219 - Stream to River Rother 1km SW of Trotton and 6km W of Midhurst (West Sussex). 27.ix.70
181. 830510 - Lake-fed stream NE of Beacon Hill and 3km SE of Fleet (Hampshire). 3.vi.2001
182. 834401 - River Wey 1.5km SW of Frensham and 7km S of Farnham town centre (Hampshire/Surrey). 15.v.76
183. 835334 - River Wey headstream 2km N of Liphook and 1km NW of Bramshott (Hampshire). 15.ix.73
184. 841401 - Outlet stream from Frensham Great Pond 2.5km NW of Churt (Hampshire/Surrey). 26.vii.71
185. 842230 - River Rother at Chithurst 5km WNW of Midhurst (West Sussex). 27.ix.70
186. 846235 - Hammer stream below lake exit near Chithurst (West Sussex). 27.ix.70
187. 853107 - River Lavant near Binderton House 6km N of Chichester city centre (West Sussex). 25.iv.74, 26.iv.80, 30.iv.94, 4.v.96
188. 854381 - Tributary of River Wey at Churt 4.5km NW of Hindhead (Hampshire/Surrey). 11.ix.76
189. 860084 - River Lavant at East Lavant 4km N of Chichester city centre (West Sussex). 22.iv.74, 27.iv.75, 14.iv.79, 5.v.79, 12.v.79, 26.iv.80, 23.iv.85, 30.iv.94
190. 860466 - River Wey at Culverlands 2km E of Farnham town centre (Surrey). 15.v.76
191. 863258 - Stream at Woolbeding Common 5km NNW of Midhurst on road to Liphook (West Sussex). 26.iv.75, 23.iv.85
192. 863345 - Spring stream at Waggoners Wells 3km NE of Bramshott (Hampshire). 26.ix.75
193. 866955 - Chalk stream at Hughenden Manor 2.5km N of High Wycombe town centre (Buckinghamshire). 21.v.72
194. 870715 - Stream 2km N of Bracknell town centre and 3km E of Binfield (Berkshire). 26.vi.76
195. 872287 - Stream by Minepit Copse 3km W of Fernhurst (West Sussex). 23.ix.85
196. 873303 - Stream from Cognor Wood 1.0km SE of Linchmere (West Sussex). 26.iv.75
197. 873435 - River Wey at Tilford 4.5km SE of Farnham town centre (Surrey). 15.v.76
198. 874326 - Stream at Hammer Bottom 3.0km W of Haslemere town centre (Hampshire/Surrey). 26.iv.75
199. 875131 - River Lavant at Singleton 9.5km NNE of Chichester city centre (West Sussex). 25.iv.74
200. 879174 - Chalk stream at Cocking 4.5km S of Midhurst on road to Chichester (West Sussex). 22.viii.73
201. 887189 - Stream 2km NNE of Cocking and 2.5km S of Midhurst (West Sussex). 15.vi.74
202. 890130 - River Lavant source at Charlton 1.5km E of Singleton (West Sussex). 20.iv.75
203. 893027 - Stream near Merston 4km SE of Chichester city centre (West Sussex). 22.iv.74
204. 896397 - Stream at west end of Thursley 7km N of Haslemere town centre (Surrey). 26.vii.71
205. 899211 - Stream to River Rother near West Lavington 1.5km E of Midhurst (West Sussex). 16.vi.74
206. 904190 - Stream at Polecats 3km SE of Midhurst and 1km NE of Heyshott (West Sussex). 24.iv.80, 23.iv.85
207. 905195 - Stream on west side of Ambersham Common near Polecats 3km SE of Midhurst (West Sussex). 16.vi.74
208. 905438 - River Wey at Elstead 4.5km WNW of Milford and 7km W of Godalming (Surrey). 24.iv.80
209. 911456 - Stream bisecting The Tarn on Puttenham Common 2km N of Elstead (Surrey). 6.vi.71, 11.ix.76
210. 915398 - Stream into Hammer Pond 1.5km E of Thursley and 5km NE of Hindhead (Surrey). 26.vii.71
211. 915992 - River Misbourne near Little Missenden 3km SE of Great Missenden (Buckinghamshire). 4.vii.71
212. 916404 - Exit pipe from Hammer Pond at Thursley Common 3.5km SW of Milford (Surrey). 26.vii.71
213. 922439 - River Wey between Elstead and Peper Harrow 3km WNW of Milford (Surrey). 6.vi.71, 11.ix.76
214. 933618 - Lake outlet stream near Lightwater 2.5km SE of Bagshot (Surrey). 20.vi.76
215. 935214 - River Rother near Selham between Midhurst and Petworth (West Sussex). 16.vi.74, 23.iv.85
216. 937537 - Stream on Stanford Common between Pirbright and Normandy (Surrey). 26.iv.75
217. 938709 - Seepage at Woodsiepe by Windsor Great Park 2.5km NE of Ascot Race Course (Berkshire). 29.iii.85
218. 940345 - Stream 2.5km WSW of Chiddingfold and 4km NE of Haslemere town centre (Surrey). 25.v.84
219. 942193 - Stream 3.0km NW of Duncton and 4.5km SW of Petworth (West Sussex). 16.vi.74

220. 944257 - Stream 5.5km NW of Petworth and 1.5km SSE of Lurgashall (West Sussex). 16.vi.74
221. 945544 - Stanford Brook 1.5km S of Pirbright on main road to Aldershot (Surrey). 26.iv.75
222. 946316 - Lake outlet at Fisherstreet 2.5km N of Northchapel (West Sussex). 15.ix.73, 25.v.84
223. 947438 - River Wey at Eashing 2.5km W of Godalming and 1.5km N of Milford (Surrey). 15.v.76
224. 948979 - River Misbourne 1.5km WNW of Amersham town centre (Buckinghamshire). 7.vii.2000
225. 949844 - Stream at Burnham Beeches near East Burnham 2km NW of Farnham Royal (Buckinghamshire). 6.viii.72
226. 950186 - Stream at Lavington Common 4km SW of Petworth (West Sussex). 24.iv.80, 23.v.85
227. 951367 - Stream 2km NW of Chiddingfold and 1.5km S of Wormley (Surrey). 25.v.84
228. 957374 - Stream in Windsor Great Park 4km SSW of Windsor town centre (Berkshire). 29.iii.85
229. 959185 - Stream to River Rother on Duncton Common 3.5km SSW of Petworth (West Sussex). 30.iv.94
230. 962055 - Stream 1km SW of Walberton beside road to Barnham (West Sussex). 27.iv.75
231. 968348 - Stream 1.0km SE of Chiddingfold on road to Plaistow (Surrey). 15.ix.73
232. 968421 - Lake outlet stream at Tusesley 1.5km S of Godalming town centre (Surrey). 25.v.84
233. 972145 - Chalk spring 1km SW of Sutton and 1km W of Bignor (West Sussex). 20.iv.75
234. 972164 - Stream near Burton Park 1.5km ESE of Duncton (West Sussex). 28.ix.70
235. 972192 - River Rother at Coultershaw Bridge 2.5km S of Petworth (West Sussex). 16.vi.74
236. 973966 - River Misbourne 1.5km ESE of Old Amersham (Buckinghamshire). 28.vii.2000
237. 977738 - Stream to River Thames in Windsor Great Park 1.0km SW of Old Windsor (Berkshire). 29.iii.85
238. 978065 - Stream 1km NE of Walberton and 4km W of Arundel (West Sussex). 22.iv.74
239. 980180 - Lake outlet stream at St Michael's Burton Park 4km S of Petworth (West Sussex). 28.ix.70, 24.iv.80
240. 980997 - River Chess at Blackwell Hall 2.0km NE of Amersham town centre (Buckinghamshire). 28.vii.2000
241. 981281 - Stream 3km ESE of Northchapel and 6.5km N of Petworth (West Sussex). 16.iv.74
242. 983149 - Chalk stream at Bignor 0.5km SE of Sutton and 9.5km NNW of Arundel (West Sussex). 16.vi.74, 26.iv.75, 27.iii.76
243. 983357 - Stream 2km E of Chiddingfold and 2.5km W of Dunsfold (Surrey). 25.v.84
244. 983953 - River Misbourne 2.0km N of Chalfont St Giles (Buckinghamshire). 3.vii.2000
245. 984553 - Stanford Brook 2km NE of Worplesdon and 4km SW of Woking town centre (Surrey). 21.ix.75
246. 984709 - Stream near Englefield Green 2.5km W of Egham town centre (Surrey). 29.iii.85
247. 987677 - Stream 1km below lake at Virginia Water 3.5km E of Sunningdale (Surrey). 26.iv.75
248. 992169 - Stream at Bignor Park Cott 3.0km SW of Fittleworth (West Sussex). 26.iv.80, 23.iv.85
249. 993455 - River Wey 1.5km WNW of Bramley and 4.0km S of Guildford town centre (Surrey). 25.v.84
250. 996618 - Stream 2km E of Chobham and 3km NNW of Woking town centre (Surrey). 21.ix.75
251. 997417 - Stream from lake at Thorncombe Street 3.5km SE of Godalming town centre (Surrey). 28.ix.70
252. 998407 - Stream to lake 1km N of Hasscombe and 4km SE of Godalming town centre (Surrey). 28.ix.70

Sampling sites in 100km square TL

253. 007072 - Bulbourne tributary of River Gade 1km ESE of Berkhamsted town centre (Hertfordshire). 19.v.74
254. 007339 - Stream 2km N of Tingrith and 1.5km NE of Eversholt (Bedfordshire). 28.v.77
255. 012388 - Stream at Millbrook 2.5km WNW of Amptill (Bedfordshire). 28.v.77
256. 017066 - Bulbourne tributary of River Gade near Bourne End (Hertfordshire). 19.v.74
257. 018364 - Stream 2.5km NW of Flitwick and 2.5km SW of Amptill (Bedfordshire). 28.v.77
258. 024277 - Stream 2km SE of Toddington and 1.5km NNW of Chalton (Bedfordshire). 30.iv.77
259. 025306 - Small stream 1km W of Harlington and 2.5km NE of Toddington (Bedfordshire). 16.iv.62
260. 027063 - Bulbourne tributary of River Gade at Bourne End by Grand Union Canal (Hertfordshire). 19.viii.73
261. 031113 - River Gade near Great Gaddesden on minor road from Jockey End to Nettleden (Hertfordshire). 23.v.71
262. 047294 - Stream 1.5km SE of Harlington and 1.5km N of Upper Sundon (Bedfordshire). 28.v.77
263. 076308 - Stream just W of Barton-in-the-Clay village on minor road to Sharpenhoe (Bedfordshire). 16.iv.62
264. 086297 - Chalk spring stream in Barton Hills below Barton Springs at Barton-in-the-Clay (Bedfordshire). 29.vii.72
265. 103306 - Chalk stream in wood at Hexton 2km E of Barton-in-the-Clay (Bedfordshire/Hertfordshire). 21.v.61, 14.vi.62, 30.v.69, 28.vi.69, 6.vii.69, 26.v.69, 17.v.70, 8.v.71, 7.v.84, 27.v.84, 14.v.89, 7.iv.2000, 16.vii.2000
266. 114299 - Chalk spring stream at Pegsdon near Hexton 7km W of Hitchin town centre (Hertfordshire). 10.v.80
267. 115314 - Stream 1km NW of Pegsdon and 3km SSW of Shillington (Bedfordshire/Hertfordshire). 21.3.71
268. 129377 - Stream at Campton 2km SW of Shetford and 2km NNW of Meppershall (Bedfordshire). 30.v.75
269. 145014 - River Ver 1.5km SE of Brickett Wood and 2km NW of Radlett (Hertfordshire). 13.vi.81
270. 151022 - River Ver near Colney Street 2.5km NNW of Radlett (Hertfordshire). 13.vi.81
271. 155055 - River Ver at Sopwell 2km S of St Albans city centre (Hertfordshire). 1.xi.75
272. 162144 - River Lea at Cherry Trees midway between Harpenden and Wheathampstead (Hertfordshire). 19.viii.73
273. 177003 - Stream on Radlett to Shenley road 1.5km E of Radlett (Hertfordshire). 13.v.72
274. 178213 - River Mimram near source at Whitwell 3km N of Kington (Hertfordshire). 21.iii.71, 8.v.71
275. 179281 - Stream beside Priory Park at Charlton 1.5km SSW of Hitchin town centre (Hertfordshire). 14.vi.75
276. 188324 - River Itz 1km NE of Ickleford and 3km W of Letchworth town centre (Hertfordshire). 30.v.75
277. 192207 - River Mimram 1km ESE of Whitwell and 2.5km NE of Kington (Hertfordshire). 10.v.80
278. 198185 - River Mimram 2km E of Kington and 2km W of Codicote (Hertfordshire). 10.v.80
279. 204008 - Catherine Bourne 1.5km E of Shenley on minor road to Ridge (Hertfordshire). 29.iii.71, 16.vi.72
280. 213167 - River Mimram 1.5km S of Codicote and 2km W of Old Welwyn (Hertfordshire). 21.iii.71
281. 213384 - River Ivel at Astwick 6.5km SSE of Biggleswade and 2km NW of Stotfold (Bedfordshire). 30.v.75
282. 218208 - Bog seepage rill in Graffridge Wood near Knebworth Estate 3km W of Knebworth (Hertfordshire). 21.iii.71

25.iv.71, 24.iv.77, 28.iii.81, 29.iii.81, 21.iv.87

283. 227111 - River Lea 1.5km SE of Lemsford and 2.5km SW of Welwyn Garden City (Hertfordshire). 1.xi.75
284. 231020 - Mimshall Brook near Mimms Hall 2.5km W of Potters Bar town centre (Hertfordshire). 15.vi.81
285. 231038 - Tributary of Mimshall Brook at Water End 1km W of Brookmans Park (Hertfordshire). 15.vi.81
286. 251059 - Seepage 1.5km E of Welham Green and 2km NNE of Brookmans Park (Hertfordshire). 16.v.81
287. 260040 - Stream near Brookmans Park 3km N of Potters Bar town centre (Hertfordshire). 6.iii.82
288. 262069 - Stream at Wild Hill 2km SSW of Essendon on road to Welham Green (Hertfordshire). 16.v.81
289. 262140 - River Mimram near Welwyn Garden City 1km SW of Tewin (Hertfordshire). 31.x.75
290. 267399 - Spring source of River Cam at Ashwell 6km NNE of Baldock (Hertfordshire). 30.x.75
291. 273072 - Stream 1.5km WSW of Little Berkhamsted and 1.5km S of Essendon (Hertfordshire). 4.x.80
292. 276097 - River Lea 1km N of Essendon and 6km WSW of Hertford (Hertfordshire). 1.xi.75
293. 285028 - Stream 1km NE of Northaw on road to Newgate Street (Hertfordshire). 20.iii.71
294. 297044 - Stream to Grimes Brook 1km SW of Newgate Street near Cuffley (Hertfordshire). 4.vi.71, 3.iv.83
295. 302077 - Stream in Bayford Wood 1km SW of Bayford and 1km NE of Epping Green (Hertfordshire). 6.iii.82
296. 303005 - Stream 1km NW of Crew's Hill station and 2km S of Cuffley (London). 6.iii.82
297. 307122 - River Mimram at Hertingfordbury 1.5km W of Hertford town centre (Hertfordshire). 31.x.75
298. 308108 - River Lea at Bayfordbury 2km SW of Hertford town centre (Hertfordshire). 31.x.75
299. 315163 - Spring-fed trickle to River Beane at Stapleford 4km NNW of Hertford (Hertfordshire). 2.vii.72, 4.v.74
300. 316083 - Stream near Bayford 4.5km SSW of Hertford town centre (Hertfordshire). 31.vi.81, 3.iv.83, 27.vi.85
301. 319052 - Stream E of Newgate Street at Wormley Wood 2km N of Golf's Oak (Hertfordshire). 20.iii.71
302. 337164 - River Rib at Payne's Hall 4km NNE of Hertford town centre (Hertfordshire). 4.x.80
303. 340298 - Thistley Vale stream at Throcking 2km E of Cottred and 4km ESE of Rushden (Hertfordshire). 17.vi.87
304. 344059 - Stream on road between West End and Wormleybury 3km NNW of Cheshunt (Hertfordshire). 31.x.81
305. 344073 - Woodland trickle near Cold Hall 6.5km SSE of Hertford town centre (Hertfordshire). 31.x.81
306. 357058 - Stream at Wormleybury 3.5km N of Cheshunt and 3.5km SSW of Hoddesdon (Hertfordshire). 31.vi.81
307. 369083 - Stream to River Lea 1.5km SSW of Hoddesdon and 1km N of Broxbourne (Hertfordshire). 31.x.81
308. 374044 - River Lea 1.5km NNW of Fisher's Green and 2km NNE of Cheshunt (Essex/Hertfordshire). 10.v.79
309. 377133 - River Ash 2km SE of Ware at crossing of road to Stanstead Abbots (Hertfordshire). 31.x.75
310. 380261 - River Rib 4km SSE of Buntingford and 2km NW of Braughing (Hertfordshire). 6.iii.76
311. 384076 - River Lea 1.5km SE of Hoddesdon and 1km NW of Meadgate (Essex/Hertfordshire). 10.v.79
312. 385189 - River Rib at Barwick Ford on minor road between Standon and Ware (Hertfordshire). 2.vii.72
313. 386327 - River Quin stream 4km NE of Buntingford and 3km S of Barkway (Hertfordshire). 6.iii.76
314. 387202 - River Rib at ford 2.5km S of Standon and 2km E of Collier's End (Hertfordshire). 2.vii.72
315. 392248 - River Quin near Braughing 2km N of Standon and 5.5km SE of Buntingford (Hertfordshire). 2.vii.72
316. 402187 - Limney Bourne 2.5km W of Much Hadham and 6.5km NE of Ware (Hertfordshire). 6.iii.76
317. 403158 - River Ash 5km NE of Ware and 2km W of Widford (Hertfordshire). 20.viii.73
318. 405106 - River Stort at Roydon 2km SE of Stanstead Abbots (Essex/Hertfordshire). 3.x.83
319. 411130 - Lake outlet 1km SW of Hunsdon village and 2.5km NE of Stanstead Abbots (Hertfordshire). 2.vii.72
320. 414057 - Stream at Nazeing Park near Nazeing 5km E of Broxbourne (Essex). 3.iv.83
321. 433210 - River Ash between Little Hadham and Much Hadham (Hertfordshire). 7.vi.2001
322. 447002 - Stream from Epping Forest at Piercing Hill 1km N of Theydon Bois (Essex). 4.x.74
323. 449383 - Stream 3km E of Great Chishill on road to Wendens Ambo (Essex). 17.iv.87
324. 475354 - Wicken Water at ford 1km NW of Arkesden and 4km N of Clavering (Essex). 17.iv.87
325. 477318 - River Stort at Clavering 3km SW of Wicken Bonhunt (Essex). 14.iv.74
326. 493059 - Crispsey Brook near Little Weald Hall 2km N of North Weald Bassett (Essex). 4.x.74
327. 494259 - River Stort 0.5km S of Manuden and 5km N of Bishop's Stortford centre (Essex). 7.vi.2001
328. 503238 - River Stort between Bishop's Stortford and Stansted Mountfitchet (Essex/Hertfordshire). 20.vii.73
329. 511065 - Crispsey Brook at Weald Bridge 3km NE of North Weald Bassett (Essex). 30.x.81
330. 518400 - River Cam (= Granta) at Littlebury 3km NW of Saffron Walden town centre (Essex). 16.xi.61
331. 524048 - Stream near Lower Bobbingworth Green 2.5km E of North Weald Bassett (Essex). 30.x.81
332. 526121 - Lake outlet at Matching Church 3km S of Hatfield Heath (Essex). 14.v.72
333. 526134 - Piney Brook 1.5km S of Hatfield Heath on road to Matching Green (Essex). 14.x.72
334. 529029 - Stream near Greensted Green 2.5km W of Chipping Ongar (Essex). 30.x.81
335. 534323 - Stream to River Cam 1km NW of Widdington and 2km SSE of Newport (Essex). 17.iv.87
336. 535095 - Stream 1.5km S of Matching Green and 2.5km N of Moreton (Essex). 14.x.72
337. 538203 - Stream in Hatfield Forest Park 5km E of Bishop's Stortford town centre (Essex). 14.iv.74
338. 540196 - Lake outlet in Hatfield Forest 5km ESE of Bishop's Stortford town centre (Essex). 14.iv.74
339. 559014 - River Rodling at Langford Bridge 1.5km SSE of Chipping Ongar (Essex). 30.x.81
340. 564328 - Stream 1km SE of Debden and 6km WNW of Thaxted (Essex). 17.iv.87
341. 570037 - Stream to River Rodling at High Ongar 3km W of Norton Heath (Essex). 14.v.72
342. 582277 - Stream 1km NE of Broxton at crossing of Elsenham to Thaxted road (Essex). 14.v.72, 14.iv.74
343. 585129 - River Rodling 1km SW of Leaden Rodling on road to Hatfield Heath (Essex). 21.vi.81
344. 590089 - River Rodling at Bird's Green 3km NE of Fyfield (Essex). 24.vi.71
345. 596180 - River Rodling at Great Canfield 5km SW of Great Dunmow (Essex). 21.vi.81
346. 602269 - River Chelmer headstream at Dutton Hill 4.5km SSW of Thaxted (Essex). 20.viii.73
347. 607320 - River Chelmer headstream at Armitage Bridge 1km NNW of Thaxted (Essex). 14.v.72
348. 613126 - River Can at Mott's Green near Good Easter 2km ESE of Leaden Rodling (Essex). 28.vi.81

349. 620237 - River Chelmer 2km NNW of Great Dunmow on road to Thaxted (Essex). 20.viii.73
350. 629336 - Stream on Thaxted to Great Sampford road 3km NE of Thaxted (Essex). 17.iv.87
351. 633072 - Roswell Brook 2km SW of Roswell and 1km NW of Cooksmill Green (Essex). 23.vii.71
352. 637216 - River Chelmer near Great Dunmow 2km W of Little Dunmow (Essex). 21.vi.81
353. 640022 - Stream 3km NNW of Ingatestone and 4km W of Margarett (Essex). 16.v.71
354. 654338 - River Pant at Little Sampford 3km WNW of Finchingfield (Essex). 14.iv.74
355. 659085 - Roswell Brook at Blackwall Bridge 5km W of Chelmsford town centre (Essex). 23.vii.71
356. 661238 - Stebbing Brook at Stebbing 4km NE of Great Dunmow town centre (Essex). 21.vi.81
357. 670190 - River Chelmer at bridge on road to North End 1.5km SSW of Felsted (Essex). 20.viii.73
358. 693174 - River Chelmer near Hartford End 3.5km SSE of Felsted (Essex). 19.x.75
359. 694310 - River Pant 2km SSE of Finchingfield and 2km E of Great Bardfield (Essex). 28.vi.81
360. 699148 - River Chelmer at Howe Street near Great Waltham 8km N of Chelmsford (Essex). 19.x.75
361. 709268 - Pods Brook at Shalford Green 1.5km NE of Great Saling (Essex). 21.vi.81
362. 715103 - River Chelmer 1km E of Broomfield and 4km N of Chelmsford town centre (Essex). 19.x.75
363. 724001 - Stream 0.5km NW of West Hanningfield and 7.5km SSE of Chelmsford (Essex). 17.v.71
364. 725165 - River Ter 7km SSW of Braintree on road to Chelmsford near Great Leighs (Essex). 28.vi.81
365. 734390 - River Colne headwater 1km E of Stambourne and 2km S of Ridgewell (Essex). 28.vi.81
366. 735281 - River Pant at Great Codham Hall 6km NNW of Braintree town centre (Essex). 21.vi.81
367. 737365 - River Colne headwater 3km SW of Great Yeldham and 3km SE of Stambourne (Essex). 28.vi.81
368. 765066 - Stream in Blake's Wood 2km NW of Danbury and 3km SSW of Boreham (Essex). 13.iv.85
369. 772147 - River Ter near Terling 5km W of Witham and 4km NW of Hatfield Peverell (Essex). 23.vii.71
370. 774060 - Stream at Lingwood Common near Danbury 1.5km SSW of Little Baddow (Essex). 13.iv.85
371. 776293 - Outlet of Bourne Brook from Gosfield Lake 4km WSW of Halstead (Essex). 24.vii.71
372. 777355 - River Colne at Nunery Bridge 1km W of Castle Hedingham (Essex). 28.vi.81
373. 787084 - Stream to River Chelmer 3km N of Danbury near Little Baddow (Essex). 13.vi.85
374. 787184 - River Brain at White Notley 5.5km SSE of Braintree town centre (Essex). 28.vi.81
375. 791245 - River Blackwater 1km SW of Sisted and 4km ENE of Braintree town centre (Essex). 19.x.75
376. 793332 - River Colne weir 1.5km SE of Sible Hedingham and 3.5km NW of Halstead (Essex). 24.vii.71
377. 807068 - Stream at Woodham Water 4.5km W of Maldon and 3km ENE of Danbury (Essex). 19.x.75
378. 808286 - Bourne Brook 2km SSW of Halstead and 1.5km WNW of Grinstead Green (Essex). 19.x.75
379. 809394 - Belchamp Brook 1km N of Gestingthorpe and 6.5km WSW of Sudbury (Essex). 19.x.75
380. 813344 - Stream at Lucking Street near Great Maplestead 4km N of Halstead (Essex). 19.x.75
381. 814025 - Stream at Cock Clarks 6km SW of Maldon and 4km SE of Danbury (Essex). 13.iv.85
382. 816155 - River Brain at Chippinghill near Witham on road to Terling (Essex). 28.vi.81
383. 824188 - Lake outlet stream from Rivenhall Place near Silver End 4km N of Witham (Essex). 23.vii.71
384. 844157 - River Blackwater near Rivenhall End 2.5km ENE of Witham (Essex). 19.x.75
385. 848298 - River Colne near Colne Engaine 3.5km E of Halstead (Essex). 24.viii.73
386. 854213 - River Blackwater near Coggeshall to Kelvedon road 1.5km S of Coggeshall (Essex). 28.vi.81
387. 860308 - Stream to River Colne 1km NE of Colne Engaine and 4.5km E of Halstead (Essex). 24.viii.73
388. 862322 - Streamlet in wood 1.5km SSE of Pebmarsh and 2km NNE of Colne Engaine (Essex). 28.vi.81
389. 868087 - Stream to Blackwater River estuary 2.5km NE of Maldon town centre (Essex). 4.viii.73
390. 881326 - Stream 3km SW of Bures and 3km ESE of Pebmarsh on road to Earls Colne (Essex). 24.viii.73
391. 883099 - Stream 4.5km NE of Maldon near Little Totham Hall on road to Little Totham (Essex). 4.viii.73
392. 886371 - Stream to River Stour 1.5km N of Lamarsh and 4.5km S of Sudbury (Essex). 24.viii.73
393. 895285 - River Colne at bridge crossing between Chappel and Wakes Colne (Essex). 28.vi.81
394. 929271 - River Colne 1.5km S of Fordham and 3km W of West Bergholt (Essex). 18.x.75
395. 930356 - Stream to River Stour 3km S of Assington and 3km NE of Bures (Suffolk). 23.iii.71
396. 933329 - River Stour near Wormingford 3km ESE of Bures (Essex/Suffolk). 23.vii.71
397. 946145 - Stream to Salcott Creek near Salcott 3km NNE of Tolleshunt D'Arcy (Essex). 4.viii.73
398. 956266 - River Colne 1km S of West Bergholt and 5km WNW of Colchester (Essex). 18.x.75
399. 975210 - Roman River 5km SSW of Colchester on road to Layer-de-la-Haye (Essex). 4.viii.73

Sampling sites in 100km square TM

400. 013344 - River Stour below weir 3km W of Stratford St Mary (Essex/Suffolk). 18.x.75
401. 013355 - River Box at Thorington Street 2km W of Ilham (Suffolk). 18.x.75
402. 032385 - River Brett at Shelley 4.5km S of Hadleigh (Suffolk). 18.x.75
403. 045223 - Lake outlet stream in Wivenhoe 5.5km SE of Colchester town centre (Essex). 26.vi.77
404. 074246 - Stream 1km E of Elmstead Market and 7.5km E of Colchester town centre (Essex). 26.vi.77
405. 079207 - Stream 4km N of Brightlingsea and 2km NW of Thorrington (Essex). 26.vi.77
406. 083387 - Stream at Little Wenham near Chapel St Mary 7.5km SE of Hadleigh (Suffolk). 4.viii.73
407. 109194 - Stream 3km NE of Brightlingsea and 1.5km SE of Thorrington (Essex). 26.vi.77
408. 134381 - Stream on Manningtree to Ipswich road at Tattingstone White Horse (Suffolk). 4.viii.73
409. 169357 - Stream from lake 1km S of Holbrook and 9km S of Ipswich town centre (Suffolk). 4.viii.73
410. 173361 - Lake outlet in gardens at Holbrook 8.5km S of Ipswich town centre (Suffolk). 4.viii.73
411. 188276 - Stream near Great Oakley 3km ESE of Wix and 6km N of Thorpe-le-Soken (Essex). 26.vi.77
412. 206289 - Stream at Saltwater Bridge 1.5km W of Little Oakley (Essex). 26.vi.77
413. 289383 - Stream 1km SW of Falkenham and 3.5km NNW of Felixstowe town centre (Suffolk). 4.vi.83

Sampling sites in 100km square TQ

414. 002152 - Stream 4km S of Fittleworth and 1.5km WSW of Watersfield (West Sussex). 16.vi.74
 415. 003353 - Stream 1km S of Dunsfold and 4.5km N of Plaistow (Surrey). 28.ix.70
 416. 005214 - Stream on Bognor Common 3km E of Petworth and 2.5km N of Fittleworth (West Sussex). 8.v.77, 20.iv.80, 23.iv.85
 417. 005531 - River Wey near Jacobs Well 4km NNE of Guildford town centre (Surrey). 21.ix.75
 418. 005831 - Blackpark Lake outlet 2km W of Iwer Heath and 2km ESE of Stoke Poges (Buckinghamshire). 24.iv.82
 419. 005986 - River Chess 1.5km W of Chenies and 0.5km SE of Latimer (Buckinghamshire). 28.vii.2000
 420. 006671 - Lake outlet stream between Virginia Water and Lyne 2km SW of Thorpe (Surrey). 30.v.71
 421. 008854 - Alder Bourne 1km E of Fulmer and 3km S of Gerrard's Cross (Buckinghamshire). 24.iv.82
 422. 011169 - Stream in wood 2.5km S of Fittleworth and 1km NW of Watersfield (West Sussex). 27.iii.76
 423. 013883 - River Misbourne between Gerrard's Cross and Higher Denham (Buckinghamshire). 24.iv.82
 424. 015768 - Brook 0.5km SW of Colnbrook beside Queen Mother (= Datchet) reservoir (Berkshire). 29.iii.84
 425. 017619 - The Bourne 2km S of Ottershaw and 4.5km NNE of Woking town centre (Surrey). 29.v.75
 426. 025853 - Alder Bourne by Gossam's Wood near Rush Green 2km SW of Denham (Buckinghamshire). 14.iii.71
 427. 026990 - River Chess at Sarra Bottom near Sarra 1km NE of Chenies (Buckinghamshire/Hertfordshire). 23.ix.61, 13.vi.71
 428. 037847 - Alder Bourne at old bridge on Denham to Iwer Heath road 2km S of Denham (Buckinghamshire). 24.iv.82
 429. 039477 - Tilling Bourne 1km W of Albury and 4km ESE of Guildford town centre (Surrey). 25.v.84
 430. 041813 - River Colne at Iwer 3km SSW of Uxbridge town centre (Buckinghamshire). 4.x.80
 431. 042273 - Sparr Farm 1.5km NW of Wisborough Green (West Sussex). 12.v.80, 17.v.80
 432. 042971 - River Chess by Beechgrove Wood near Chorleywood at crossing of M25 (Hertfordshire). 9.v.81
 433. 043435 - Exit stream exit from small lake 1km E of Shamley Green (Surrey). 15.iii.75
 434. 043931 - River Colne 1.5km SW of Rickmansworth town centre (Hertfordshire/London). 14.ix.80, 15.xi.81, 9.x.82, 24.vii.2000
 435. 044866 - River Misbourne at Denham village 3km NNW of Uxbridge (Buckinghamshire). 14.iii.71
 436. 045415 - Stream near Rowly 3km NW of Cranleigh and 3km SE of Shamley Green (Surrey). 15.iii.75
 437. 045883 - River Colne between Denham Green and South Harefield (Buckinghamshire/London). 9.x.80
 438. 047156 - Stream to River Arun near Greatham 3km S of Pulborough (West Sussex). 27.iii.77
 439. 050771 - River Colne at Longford near NW corner of Heathrow Airport (London). 6.v.81
 440. 054411 - Stream at Smithwood Common 2km NNW of Cranleigh (Surrey). 15.iii.75
 441. 054961 - River Chess at Loudwater near Chorleywood 1.5km NNW of Rickmansworth (Hertfordshire). 9.v.81
 442. 059463 - Tributary of Tilling Bourne at Brook 2km SW of Shere (Surrey). 10.v.70
 443. 063560 - Stream to River Wey at Guleshill Farm 1.5km SE of Ripley (Surrey). 10.v.70
 444. 064444 - Stream in Winterford Forest 2km S of Brook and 3.5km SSW of Shere (Surrey). 15.iii.75
 445. 064586 - River Wey at Wisley in Royal Horticultural Society's Gardens (Surrey). 9.vii.72
 446. 065180 - River Stour 2km E of Pulborough on main road to Storrington (West Sussex). 16.ix.72
 447. 066896 - Stream 1.5km SE of Harefield and 3.5km NW of Ruislip centre (London). 14.iii.71
 448. 068260 - River Arun at new bridge crossing of Wisborough Green to Billingshurst road (West Sussex). 16.ix.72, 17.v.80
 449. 070613 - River Wey at bridge near Byfleet 4km S of Weybridge town centre (Surrey). 22.v.81
 450. 071271 - River Arun 2km NW of Billingshurst near Rowner Farm (West Sussex). 17.v.80
 451. 071303 - River Arun 5km NNW of Billingshurst and 3.5km WNW of Five Oaks (West Sussex). 17.v.80
 452. 071397 - Stream 1.5km NE of Cranleigh on road to Ewhurst (Surrey). 15.iii.75
 453. 074891 - Stream in Mad Bess' Wood 2.5km NW of Ruislip town centre (London). 14.iii.71
 454. 079167 - Lake outlet at West Chillington Common 4km SE of Pulborough (West Sussex). 16.ix.72
 455. 086397 - Stream 1km SW of Ewhurst on Cranleigh road beside Upper Canfold Wood (Surrey). 15.iii.75
 456. 086888 - Outlet stream from Ruislip Lido (lake) 1.5km NNW of Ruislip (London). 18.ii.72
 457. 087477 - Tilling Bourne at Gornshall railway bridge 8km WSW of Dorking (Surrey). 25.v.84
 458. 091678 - River Ash between Upper and Lower Halliford 1km E of Shepperton station (Surrey). 29.iii.84
 459. 092132 - Chalk stream from South Downs 1.5km SE of Storrington (West Sussex). 16.ix.72
 460. 094585 - Stream to River Mole from Hatchford Park grounds 2km SW of Cobham (Surrey). 22.v.81
 461. 098605 - River Mole near Pain's Hill 1km WNW of Cobham (Surrey). 9.x.76
 462. 101584 - Stream to River Mole 2km SSW of Cobham and 1.0km W of Downsides (Surrey). 22.v.81
 463. 107473 - Tilling Bourne 1.5km E of Abinger Hammer and 6.5km WSW of Dorking (Surrey). 10.v.70
 464. 107595 - River Mole crossing near Cobham on minor road S to Downsides (Surrey). 23.vii.72
 465. 110382 - Stream from Somersbury Wood 3km SE of Ewhurst (Surrey). 15.iii.75
 466. 114426 - Stream 1.5km S of Holmbury St Mary and 1.5km NW of Forest Green (Surrey). 10.v.70
 467. 117469 - Tilling Bourne 1.5km N of Abinger and 5.5km WSW of Dorking (Surrey). 8.ii.75
 468. 120567 - Stream W side of Bookham Common 6km W of Leatherhead (Surrey). 23.vii.72
 469. 124984 - River Colne near North Watford 1.5km W of Aldenham (Hertfordshire). 13.vi.81
 470. 126415 - Stream at Forest Green 3.5km E of Ewhurst and 9.5km SW of Dorking (Surrey). 15.iii.75
 471. 126562 - Lake outlet on Bookham Common 5km W of Leatherhead (Surrey). 9.v.75
 472. 127456 - Stream to Tilling Bourne at Friday Street 1km E of Abinger (Surrey). 8.ii.75
 473. 127562 - Stream between ponds on Bookham Common (Surrey). 27.iii.77
 474. 130427 - Stream on SW side of Leith Hill 1.5km NNE of Forest Green (Surrey). 18.v.85
 475. 133580 - River Mole 1km SE of Stoke D'Abernon and 4km WNW of Leatherhead (Surrey). 9.v.76

476. 134334 - North River 5km NW of Horsham and 2.5km W of Warnham (West Sussex). 29.iv.72
477. 143135 - Stream from 2km E of Washington and 4km NW of Steyning (West Sussex). 8.v.77
478. 144143 - North-flowing stream from South Downs 2.5km NE of Washington (West Sussex). 16.ix.72
479. 144675 - River Ember behind Ember Farm walk at East Molesey (Surrey). 11.ix.92
480. 148571 - River Mole near Fetcham 2km WNW of Leatherhead town centre (Surrey). 22.v.81
481. 148647 - Stream at S end of Littleworth Common 1km E of Esher town centre (Surrey). 1.x.72
482. 152375 - North River tributary of River Arun 2km SSE of Ockley (Surrey). 15.iii.75
483. 154927 - Seepage stream on Stanmore Common near Bentley Priory (London). 31.iii.74, 23.iv.77
484. 157940 - Trickle to main stream on Stanmore Common 2.25km NW of Stanmore centre (London). 13.iii.71, 9.iv.71, 6.v.72, 15.iv.74, 8.ix.84, 11.iv.91, 22.iv.91, 9.v.91, 2.v.93
485. 158938 - Main stream on Stanmore Common 2km NW of Stanmore centre (London). 13.iii.71
486. 159433 - Stream at Minnickfold 6km S of Dorking and 2km SW of Holmwood (Surrey). 8.ii.75
487. 159926 - Stream by Stanmore Common deer park 1km WNW of Stanmore (London). 31.iii.74
488. 162941 - Lake outlet on E side of Stanmore Common 2km NNW of Stanmore (London). 8.iv.69
489. 166213 - Stream to River Adur 1km NW of West Grinstead (West Sussex). 31.viii.75
490. 170248 - Stream at Copsale 6km S of Horsham town centre (West Sussex). 29.ix.74
491. 170537 - River Mole at Mickleham 3km S of Leatherhead town centre (Surrey). 22.v.81
492. 172518 - River Mole at foot of Box Hill 1.5km S of Mickleham (Surrey). 30.vii.72
493. 183502 - River Mole S of Box Hill 1.5km ENE of Dorking town centre (Surrey). 9.v.76
494. 185447 - Stream 1.5km E of South Holmwood and 5.5km SSE of Dorking (Surrey). 8.ii.75
495. 195496 - River Mole at Brockham 2.5km E of Dorking town centre (Surrey). 9.v.76
496. 197995 - Catharine Bourne stream 1.5km SE of Shenley (Hertfordshire). 29.iii.71
497. 202733 - Outlet from Pen Ponds in Richmond Park 3km SE of Richmond (London). 18.vi.67, 18.v.69
498. 203357 - Stream 1.5km S of Ruspur and 6km NNE of Horsham town centre (West Sussex). 9.v.71
499. 204642 - Headwater of Hogsmill River at West Ewell 1.5km SW of Worcester Park (Surrey). 1.x.72
500. 208270 - Lake outlet 1.5km W of Lower Beeding and 5km SE of Horsham (West Sussex). 29.ix.74
501. 210739 - Stream from Pen Ponds to Beverley Brook in Richmond Park (London). 12.iii.71, 30.v.71
502. 213504 - Lake seepage stream in Broome Park 1km N of Betchworth (Surrey). 22.v.81
503. 216291 - Hawkins Pond outlet 5km W of Handersoss and 4.5km ESE of Horsham (West Sussex). 7.ix.80
504. 216423 - Stream 2km E of Newdigate and 3km WNW of Charlwood (Surrey). 25.vi.72
505. 232401 - Stream in Glover's Wood 2.0km SW of Charlwood (Surrey). 8.ii.75
506. 227507 - Stream 1km E of Buckland on Dorking to Reigate main road (Surrey). 30.vii.72
507. 231997 - Stream near Dancers Hill 3km NNW of Barnet (Hertfordshire). 15.vi.81
508. 234480 - River Mole 3km SE of Betchworth and 3km SW of Reigate town centre (Surrey). 30.vii.72
509. 234950 - Source stream of Dollis Brook at Ducks Island in Arkley valley (London). 30.v.77
510. 235446 - Deanoak Brook 4.5km NE of Newdigate and 4km N of Charlwood (Surrey). 9.v.71
511. 237934 - Ditch to Folly Brook in Totteridge valley 1km NE of Mill Hill village (London). 6.v.72
512. 240933 - Folly Brook in Totteridge valley 1km SW of Totteridge church (London). 10.iv.76, 2.v.93
513. 242935 - Streamlet to Darlands Lake 0.5km SW of Totteridge church (London). 13.iii.71
514. 244934 - Outlet from Darlands Lake in Totteridge valley (London). 11.vii.97
515. 246114 - Chalk spring from South Downs at Fulking 2km WSW of Poyning's (West Sussex). 16.ix.72
516. 247408 - River Mole at Charlwood near western end of Gatwick Airport (West Sussex). 7.ix.80
517. 247498 - Lake outlet stream near The Priory 1km SW of Reigate town (Surrey). 30.vii.72
518. 247931 - Stream below Darlands Lake near Laurel Farm in Totteridge valley (London). 18.v.69, 24.v.69, 22.vi.69
519. 253275 - River Ouse near source 2.5km SSW of Handersoss (West Sussex). 29.ix.74
520. 254926 - Folly Brook stream near junction with Dollis Brook at Woodside Park (London). 14.v.72
521. 255194 - River Adur at weir 3.5km NW of Hurstpierpoint (West Sussex). 16.ix.72
522. 256944 - Ditch to Dollis Brook from South Herts Golf course at Totteridge (London). 21.vi.69
523. 261126 - Stream near Poyning's 4.5km SSW of Hurstpierpoint (West Sussex). 27.iii.76
524. 270968 - Stream to W side of lake in Hadley Wood 2.5km E of Barnet (London). 27.ii.71, 4.iv.71
525. 273969 - Stream to E side of lake in Hadley Wood 1km NW of Cockfosters (London). 27.ii.71
526. 280337 - Trickle in Tilgate Forest by M23 motorway 3km SSE of Crawley town centre (Surrey). 8.v.77
527. 282274 - River Ouse near Staplefield 3.5km NW of Cuckfield (West Sussex). 31.viii.75
528. 285524 - Stream E side of Gattin Park near Mersham 2km N of Redhill (Surrey). 8.ii.75
529. 289975 - Outfall between lakes in Trent Park 1.5km NE of Cockfosters (London). 15.iv.74
530. 295517 - Stream from infilled quarry 1.5km S of Mersham and 2km NW of Nutfield (Surrey). 22.5.81
531. 299360 - Stream on Horley to Balcombe road 1km SE of Three Bridges station (West Sussex). 29.ix.74
532. 303436 - Stream to River Mole 1.5km ENE of Horley near road to Smallfield (Surrey). 19.iv.71
533. 304381 - Stream in wood at Wakehams Green 2km SW of Cophorne (Surrey). 25.iv.72
534. 307404 - Stream at Shipley Bridge 3.5km SE of Horley and 1km SW of Burstow (Surrey). 8.ii.75
535. 310707 - Ditch at The Rookery open space by Streatham Common (London). 10.iv.75
536. 312146 - Stream from South Downs near Keymer 1.5km SE of Hassocks (West Sussex). 16.ix.72
537. 312524 - Stream near Warwick Wold on minor road between Mersham and Bletchingley (Surrey). 9.v.71
538. 314517 - Lake outlet stream at Pendell Court 1.5km NW of Bletchingley (Surrey). 9.v.71
539. 317322 - Stream at Warren Wood 2km NNE of Balcombe (West Sussex). 21.vii.74
540. 318305 - Lake outlet 1km E of Balcombe on road to Ardingly (West Sussex). 21.vii.74
541. 332299 - Stream to River Ouse on Balcombe to Ardingly road (West Sussex). 21.vii.74

542. 334183 - Stream below pond on Ditchling Common 2km SE of Burgess Hill (East Sussex). 8.v.77
543. 336179 - Stream on Ditchling Common 3km N of Ditchling (East Sussex). 8.v.77
544. 347303 - Stream 1km N of Ardingly just to E of road to Turners Hill (West Sussex). 21.vii.74
545. 351141 - Chalk stream from South Downs 1.5km WN of Plumpton (East Sussex). 10.xi.74
546. 352166 - Stream 1.5km W of Plumpton Green and 3.5km S of Wivelsfield Green (East Sussex). 10.xi.74
547. 357229 - Stream 2.5km E of Haywards Heath and 1km W of Scaynes Hill (East Sussex/West Sussex). 10.xi.74
548. 357509 - Gibbs Brook near Leigh Place 1km ESE of Godstone (Surrey). 20.iii.76
549. 365152 - Stream 2km S of Plumpton Green and 1.5km E of Streat (East Sussex). 10.xi.74
550. 369359 - Stream flowing to Weir Woods reservoir 3.5km SW of East Grinstead (West Sussex). 19.x.84
551. 374983 - River Lea at Enfield Weir 2.5km SSW of Waltham Abbey (Essex/London). 8.v.79
552. 375207 - Stream on Chailey Common 2.5km NW of Chailey (East Sussex). 18.v.75
553. 377490 - Gibbs Brook 1.5km S of Tandridge on road to Crowhurst Lane End (Surrey). 22.vi.75
554. 383529 - Impounded lake outlet stream 1km WNW of Oxted (Surrey). 20.iii.76
555. 385245 - River Ouse 2km NE of Scaynes Hill and 4km S of Horsted Keynes (West Sussex). 21.vii.74
556. 393513 - Stream near Stone Hall 1km S of Oxted and 2km ENE of Tandridge (Surrey). 4.iv.84
557. 394433 - Eden Brook 0.5km S of Lingfield station and 5.5km N of East Grinstead (Surrey). 22.vi.75
558. 400306 - Stream at Stumblewood Common 1.5km WNW of Chelwood Gate (East Sussex). 13.ix.70
559. 402307 - Ditch by road ford at Stumblewood Common near Chelwood Gate (East Sussex). 9.v.86
560. 402479 - River Eden 5km WNW of Edenbridge and 1.5km NE of Crowhurst (Surrey). 22.vi.75
561. 404307 - Main stream on Stumblewood Common near Chelwood Gate (East Sussex). 3.x.70, 15.x.72, 5.v.74, 9.v.86, 18.iv.91, 28.iv.93, 19.iv.94
562. 405308 - Feeder to main stream at Stumblewood Common near Chelwood Gate (East Sussex). 17.viii.69, 3.v.70, 6.ix.70, 15.x.72, 19.iv.94
563. 407967 - Stream on Whitehouse Plain in Epping Forest 2km NW of Loughton station (Essex). 3.iv.71
564. 409343 - Stream at South Green 1km S of Titsey and 1.5km N of Limsfield (Surrey). 4.iv.84
565. 411512 - Spring-fed stream 1.5km S of Limsfield on road to Itchingwood Common (Surrey). 20.iii.76
566. 412443 - Stream to Eden Brook 4km SW of Edenbridge and 2km NE of Lingfield (Surrey). 22.iv.75
567. 415276 - Stream flowing S from Chelwood Common 1.5km E of Danehill (East Sussex). 9.v.86
568. 416250 - Stream at Sheffield Green 3km ESE of Danehill (East Sussex). 15.x.72
569. 416504 - South-flowing stream from Itchingwood Common 2.5km SSE of Limsfield (Surrey). 20.iii.76
570. 420506 - Stream on Itchingwood Common 2km W of Crockham Hill (Surrey). 20.iii.76
571. 422985 - Stream in Great Monk Wood of Epping Forest 3km W of Theydon Bois (Essex). 3.iv.71
572. 424228 - River Ouse 1km SW of Fletching and 2km N of Newick (East Sussex). 15.x.72
573. 427459 - Kent Brook 2km W of Edenbridge and 4km NE of Lingfield (Kent/Surrey). 22.vi.75
574. 434147 - Weir on River Ouse at Barcombe House 1.5km SE of Barcombe Cross (East Sussex). 7.vii.74
575. 438546 - Roadside chalk stream 1km NW of Westerham (Kent). 19.iii.77
576. 441287 - Ashdown Forest stream 1km N of Nutley and 4km SE of Wych Cross (East Sussex). 6.v.70, 13.ix.70
577. 443223 - Lake outlet at Piltdown Golf course 3km SW of Maresfield (East Sussex). 17.iv.77
578. 445342 - Stream at Quabrook 2.5km ESE of Forest Row on road to Hartfield (East Sussex). 18.x.75
579. 445525 - Stream in Squerrys Court parkland 1.5km S of Westerham (Kent). 20.v.81
580. 446935 - Stream on NE side of Chigwell 2km W of Chigwell Row (Essex). 16.ii.75
581. 448182 - Tributary of River Ouse at Isfield 4.5km SW of Uckfield (East Sussex). 7.vii.74
582. 453383 - Stream 4km NW of Hartfield and 6km E of East Grinstead town centre (East Sussex). 10.vii.71
583. 455399 - Kent Water outlet from Furnace Pond 1.5km WSW of Cowden (East Sussex/Kent). 10.vii.71
584. 455516 - Waterfall in grounds of Chartwell 2.5km S of Westerham (Kent). 4.ix.84
585. 456491 - Stream at Pootings 5.5km S of Westerham and 1.5km NW of Four Elms (Kent). 13.x.74
586. 459103 - Stream 2km N of Glynde and 5km E of Lewes town centre (East Sussex). 21.iv.74
587. 461166 - Lake outlet stream at Plashett Park 5km S of Uckfield on Lewes road (East Sussex). 17.iv.77
588. 462510 - Stream at Puddledock 1km W of Toy's Hill and 3.5km SSE of Westerham (Kent). 11.v.69
589. 464559 - Chalk stream to River Darent 1.5km NW of Brasted (Kent). 20.ix.70, 12.xi.72
590. 467970 - River Roding at Abridge 2.5km SE of Theydon Bois (Essex). 12.v.84
591. 475268 - Stream near S side of Ashdown Forest 3km N of Maresfield (East Sussex). 18.v.75
592. 477335 - Stream N side of Ashdown Forest at Chuck Hatch 2.5km S of Hartfield (East Sussex). 18.iii.92
593. 483265 - Stream 1.5km W of High Hurstwood and 3km NNE of Maresfield (East Sussex). 18.v.75
594. 483470 - Stream to River Eden 1.0km W of Bough Beech and 4km ENE of Edenbridge (Kent). 4.vi.72
595. 483722 - River Cray at North Cray 1.5km E of Sidcup (London). 12.x.75
596. 484554 - Stream in Sundridge 4km ENE of Westerham and 3km W of Riverhead (Kent). 18.vii.71
597. 486527 - Stream 1km N of Ide Hill and 5.5km SW of Sevenoaks (Kent). 19.iii.77
598. 495462 - Crowborough Warren stream 2.5km WSW of Crowborough town centre (East Sussex). 18 and 19.iii.92, 28.iv.93, 19.iv.94
599. 493257 - Stream 2.5km N of Buxted and 3.5km NE of Maresfield (East Sussex). 25.v.74
600. 493730 - River Cray near Bexley 1km NE of North Cray (London). 12.v.84
601. 494074 - Chalk stream 2km NW of Aileston on Lewes to Polegate road (East Sussex). 21.iv.74
602. 494357 - Lake outlet stream at Withyham 4km WSW of Groombridge (East Sussex). 10.vii.71
603. 495414 - Stream to Kent Water at Bassetts 4km SW of Penshurst (Kent). 13.x.74
604. 495462 - River Eden 1.5km NW of Chiddingstone and 1km SE of Bough Beech (Kent). 18.v.78
605. 496415 - Lake outlet at Bassetts 4km SW of Penshurst and 4km S of Chiddingstone (Kent). 13.x.74

- (f06. 498325 - Crowborough Warren stream at Marden's Hill 2km N of Crowborough (East Sussex). 18.iii.92, 11.iv.92, 28.iv.95, 19.iv.94
607. 499366 - River Medway at Halls Green 3.5km W of Groombridge (East Sussex). 3.v.70
608. 501507 - Stream 1.5km SE of Idle Hill and 3km W of Sevenoaks Weald (Kent). 19.iii.77
609. 501944 - Headstream of River Rom near Hounsbury 2km S of Stapleford Abbots (Essex). 17.iv.82
610. 506389 - River Medway at Ashurst 3km NW of Groombridge (East Sussex/Kent). 24.ix.72
611. 510269 - Stream near Burnt Oak 4.5km S of Crowborough town centre (East Sussex). 25.v.74, 18.v.75
612. 514916 - Stream 1.5km S of Havering-Atte-Bower on N edge of Romford (London). 17.iv.74
613. 518266 - Ford Brook stream 2km NNW of Hadlow Down (East Sussex). 25.v.75
614. 518485 - Stream 2km N of Penshurst Station and 2.5km SSW of Sevenoaks Weald (Kent). 19.iii.77
615. 521506 - Stream 1km W of Sevenoaks Weald and 4.5km N of Penshurst station (Kent). 19.iii.77
616. 523413 - River Medway 2.5km S of Penshurst on road to Groombridge (Kent). 18.v.78
617. 523431 - River Eden 1km SSW of Penshurst on road to Groombridge (Kent). 24.v.78
618. 524257 - Stream 3.5km NE of Buxted and 2km NNW of Hadlow Down (East Sussex). 25.v.74
619. 524593 - River Darent at Otford 4km N of Sevenoaks town centre (Kent). 12.x.75
620. 527637 - River Darent near Lullingstone 2.5km SW of Eynsford (Kent). 18.vii.71
621. 527929 - Stream 1.5km E of Havering-Atte-Bower and 3km N of Gidea Park (Essex). 16.ii.75
622. 528982 - River Roding 1.5km W of Navestock Hall and 4km NE of Stapleford Abbots (Essex). 12.v.84
623. 529365 - Tributary of River Medway 1km S of Groombridge (East Sussex). 24.ix.72
624. 530337 - Stream 1km NW of Boarshead and 3km NNE of Crowborough (East Sussex). 11.iv.92
625. 532222 - Stream at Cropwits 2km S of Hadlow Down (East Sussex). 10.vii.71
626. 533992 - Stream into River Roding about 1km NW of Navestock church (Essex). 22.vi.69
627. 536403 - Stream 1km E of Fordcombe and 4km SSE of Penshurst (Kent). 27.iii.77
628. 537068 - River Cuckmere 3km SW of Michelham Priory near Arlington Reservoir (East Sussex) [Post]. 27.viii.2000
629. 537656 - River Darent just W of Eynsford near railway viaduct (Kent). 12.x.75, 3.v.93
630. 541494 - Stream 1km SE of Fletcher's Green and 3km W of Hildenborough (Kent). 4.vi.72
631. 543980 - Stream under road near Navestock Hall 2km WNW of Navestock Side (Essex). 12.v.84
632. 546075 - Roadside ditch at Arlington 5km NNE of Alfriston (East Sussex). 17.iv.77
633. 546452 - River Medway 1.5km SSW of Leigh and 4km W of Tonbridge (Kent). 18.v.78
634. 547963 - Stream 1.5km SE of Navestock and 2km SW of Navestock Side (Essex). 22.vi.69
635. 555349 - Stream from Eridge Park 3km SE of Groombridge (East Sussex). 24.ix.72
636. 555678 - River Darent between Farningham and Horton Kirby 4km E of Swanley (Kent). 3.iv.81
637. 556093 - River Cuckmere at Michelham Priory 4km W of Hailsham (East Sussex). 10.vii.71
638. 557712 - River Darent at Darenth 4km SE of Dartford town centre (Kent). 11.v.74
639. 557965 - Stream 1km NW of Coxie Green and 1km SSW of Navestock Side (Essex). 12.v.84
640. 558415 - Stream at Speldhurst 3.5km NW of Tunbridge Wells town centre (Kent). 13.x.74
641. 558576 - Stream 1km S of Kemsing and 4km NE of Sevenoaks town centre (Kent). 9.vi.74, 4.vi.84
642. 562087 - Stream at Milton Hide Common 3km W of Hailsham (East Sussex). 14.xii.75, 21.iii.81
643. 565179 - Pond outlet 1.5km W of Horam and 2.5km SE of Waldron (East Sussex). 17.ix.72
644. 565943 - Lake outlet at Weald Park 3.5km W of Brentwood near South Weald (Essex). 30.v.81
645. 569248 - Rother headstream 3km SW of Mayfield and 1km E of Five Ashes (East Sussex). 20.iii.82
646. 573110 - River Cuckmere 1.5km SW of Hellingly and 2km NW of Hailsham (East Sussex). 14.xii.75
647. 573330 - Stream from Saxonbury Hill 3km SW of Frant (East Sussex). 27.ii.77
648. 576037 - Stream 1.5km SSW of Polegate on road to Jevington (East Sussex). 21.iv.74
649. 581232 - Woodland stream 2km N of Heathfield near Herring's Farm (East Sussex). 11.iv.92
650. 589283 - Stream 1.5km N of Mayfield and 3km S of Mark Cross (East Sussex). 25.iv.81
651. 595201 - Stream from Heathfield Park at Old Heathfield (East Sussex). 20.iii.82, 19.iv.82
652. 596898 - Stream 1.5km SE of Great Warley and 4km S of Brentwood (Essex/London). 17.iv.82
653. 597115 - Stream 1.5km ESE of Hellingly and 2km NNE of Hailsham (East Sussex). 17.iv.77
654. 601327 - Stream 3km SSE of Frant and 3.5km W of Wadhurst (East Sussex). 6.vi.75
655. 603187 - Stream 3km SE of Heathfield and 3km NE of Horam (East Sussex). 20.iii.82
656. 603253 - River Rother 2.5km SE of Mayfield on minor road to Broad Oak (East Sussex). 6.vii.74
657. 607336 - Stream 2.5km SE of Frant and 4km WNW of Wadhurst (East Sussex). 6.vii.75
658. 613536 - Stream at Plaxtol 3.5km SE of Ightham and 8km NNE of Tonbridge (Kent). 20.ix.70
659. 622852 - Stream at Stone Hall 2km W of Bulpham and 6km ESE of Upminster (Essex). 17.iv.82
660. 624975 - Stream to River Wids at Mountnessing 4.5km NE of Brentwood town centre (Essex). 13.iv.85
661. 626424 - Stream 1.5km N of Pembury and 6km SE of Tonbridge town centre (Kent). 6.vii.75
662. 629385 - River Teise at Dundle 2.5km S of Pembury (East Sussex/Kent). 6.vii.75
663. 631112 - Stream 1.5km SSW of Herstmonceux and 4.5km ENE of Hailsham (East Sussex). 17.iv.77
664. 631219 - River Duddwell 1.5km NNE of Punnett's Town (East Sussex). 19.iv.82, 26.iv.84, 18.iv.91
665. 634117 - Stream 1km S of Herstmonceux and 0.5km W of Flowers Green (East Sussex). 17.iv.77
666. 638264 - River Rother 3km N of Burwash Common and 3.5km SW of Stonegate (East Sussex). 24.vi.71, 6.vii.75
667. 643585 - Stream near Wrotham Heath 3km E of Wrotham (Kent). 7.vi.81
668. 646172 - Christian's River 3km SW of Dallington (East Sussex). 17.ix.72
669. 652438 - Stream at Colt's Hill 2.5km SW of Paddock Wood and 2km NNW of Matfield (Kent). 26.ix.70
670. 653203 - Stream at Cox's Mill 1km N of Dallington church (East Sussex). 19.iv.82, 26.iv.84, 9.v.86, 18.iv.91, 28.iv.93
671. 654152 - Huggett's Stream 1km NE of Bodle Street Green (East Sussex). 21.iv.74

672. 656257 - Lake outlet 2km NW of Burwash and 3km SSW of Stonegate (East Sussex). 6.vii.75
 673. 656365 - River Teise at Hothly near Bayham Abbey 2km W of Lamberhurst (Kent). 17.iv.72
 674. 657226 - River Dudwell at Willingford 2.5km SW of Burwash (East Sussex). 4.iv.81, 25.iv.81, 20.iii.82
 675. 657482 - Stream to River Medway at Little Mill 1km SW of East Peckham (Kent). 9.iv.75
 676. 660346 - Woodland seepage stream 1.5km SW of Lamberhurst (Kent). 27.iii.77
 677. 660589 - Stream near Addington 2.5km NW of West Malling (Kent). 7.vi.81
 678. 662099-662101 - Seepage stream 1km NNE of Wartling and 1.5km SW of Boreham Street (East Sussex). 27.iii.77, 11.iv.77, 17.iv.77, 21.iii.81, 4.iv.81, 9.v.86, 28.iv.93
 679. 663105 - Stream 1km S of Boreham Street just W of road to Wartling (East Sussex). 11.iv.77
 680. 665992 - River Wid 1.5km ESE of Ingatestone and 4.5km NNW of Billericay (Essex). 13.v.85
 681. 671927 - Stream source of River Crouch at Laindon Common 2km S of Billericay (Essex). 16.ii.75
 682. 674317 - Stream 2.5km NW of Ticehurst and 3.5km E of Wadhurst [site now submerged by southern arm of Bewl Water] (East Sussex). 23.viii.75
 683. 681608 - Stream at Birling 3km N of West Malling and 3km WSW of Snodland (Kent). 10.ix.72
 684. 683290 - River Limden 1.5km SW of Ticehurst and 2km NE of Stonegate (East Sussex). 6.v.70, 11.iv.77
 685. 684142 - Ash Bourne 3km NW of Ninfield and 3.5km NE of Boreham Street (East Sussex). 17.ix.72
 686. 684264 - River Rother 2km NE of Burwash and 3km SE of Stonegate (East Sussex). 6.vii.75
 687. 685534 - Stream to River Medway at Watlington 2.5km E of Mereworth (Kent). 9.vi.74
 688. 688352 - Seepage stream in grounds of Scotney Castle Gardens near Lamberhurst (Kent). 29.v.80
 689. 694978 - Stream 1km SSE of Stock and 3km NNE of Billericay (Essex). 13.iv.85
 690. 695413 - Lake outlet from Furnace Pond 1km NW of Horsmonden (Kent). 15.ix.74, 15.ix.83, 26.iv.84
 691. 696196 - Stream at Cackle Street 6.5km NW of Battle (East Sussex). 21.iv.74
 692. 697136 - Stream 1.5km NW of Ninfield and 6km WSW of Battle (East Sussex). 17.ix.72
 693. 701206 - Stream in Darwell Wood flowing to Darwell reservoir near Brightling (East Sussex). 6.v.70, 24.iv.71, 21.iv.74, 18.ii.78, 29.iv.78, 14.iv.79, 14.vii.79, 26.iv.80, 4.iv.81, 18.iv.91, 28.iv.93
 694. 709267 - River Rother 1km N of Etchingham and 3.5km W of Hurst Green (East Sussex). 17.ix.74
 695. 709800 - Stream to Hanningfield Water 2km FSE of Stock (Essex). 15.ix.74
 696. 713385 - River Teise 1.5km NW of Goudhurst and 3.5km SE of Horsmonden (Kent). 15.ix.74
 697. 721336 - Ditch in Bedgebury Pinetum 2.5km N of Flimwell and 4km S of Goudhurst (Kent). 27.iii.77, 29.iv.78, 26.iv.84
 698. 727432 - River Teise branch 2km SW of Marden on Claygate to Marden Beech road (Kent). 26.iv.70
 699. 733592 - Stream near Aylesford 4km NW of Maidstone town centre (Kent). 7.vi.81
 700. 734233 - Glottingham Stream at Robertsbridge 4km SE of Etchingham (East Sussex). 7.viii.76
 701. 735246 - River Rother near Salehurst 1km N of Robertsbridge (East Sussex). 29.iv.78
 702. 738241 - River Rother 1.5km N of Robertsbridge and 0.5km NW of Salehurst (East Sussex). 7.viii.76
 703. 739603 - Outlet pipe from bog pond below chalk escarpment 2km NE of Aylesford (Kent). 7.vi.81
 704. 742958 - Stream 2km N of Wickford on road to South Hanningfield (Essex). 16.ii.75
 705. 743150 - Stream 1km SSW of Battle near Battle of Hastings historic site (East Sussex). 18.ii.78
 706. 743171 - Stream 1km NNW of Battle on minor road to Netherfield (East Sussex). 21.iv.74
 707. 745184 - Stream 2.5km N of Battle on road to Robertsbridge (East Sussex). 18.ii.78
 708. 756284 - Stream 2km S of Hawkhurst and 3.5km ENE of Hurst Green (Kent). 15.ix.74
 709. 763268 - Stream 2km NW of Bodiam and 4km S of Hawkhurst (East Sussex). 27.iii.77
 710. 765163 - Stream 2km E of Battle near road to Sedlescombe Street (East Sussex). 18.ii.78
 711. 774331 - Stream 3.5km S of Cranbrook and 2km SE of Hartley (Kent). 15.ix.74
 712. 781489 - Stream 3km W of Sutton Valence and 5.5km N of Staplehurst (Kent). 11.v.75
 713. 783178 - River Brede at Sedlescombe Street 4km NE of Battle (East Sussex). 19.ix.72
 714. 783467 - River Beult 3.0km N of Staplehurst on road to Chart Sutton (Kent). 11.v.75
 715. 784253 - River Rother by Bodiam Castle 1km SE of Bodiam (East Sussex). 29.iv.78
 716. 784887 - Stream from golf course at South Benfleet (Essex). 31.iii.76
 717. 787875 - Stream onto golf course at South Benfleet (Essex). 6.iv.76
 718. 788743 - Stream near High Halstow at Sharnal Street on Rochester to Isle of Grain road (Kent). 11.v.74
 719. 793546 - River Len 3.5km ESE of Maidstone town centre and 1km NW of Otiam (Kent). 9.vi.74
 720. 795370 - Lake outlet stream 0.5km S of Sissinghurst and 2km ENE of Cranbrook (Kent). 15.ix.74
 721. 799162 - Stream on Sedlescombe Street to Westfield road (East Sussex). 17.ix.72
 722. 799444 - River Beult 1.5km NE of Staplehurst on road to Sutton Valence (Kent). 11.v.75
 723. 812170 - Stream to River Brede 1.5km N of Westfield and 2km SW of Brede (East Sussex). 17.ix.72
 724. 825444 - Weir under bridge over River Beult 1km W of Headcorn (Kent). 26.ix.70
 725. 828539 - River Len 1km NE of Leeds and 1.5km SW of Hollingbourne (Kent). 19.ix.74
 726. 829284 - Huxden Channel on Tenterden to Hastings road 3.5km SSW of Rolvenden (Kent). 22.vii.73
 727. 834187 - Stream 1km E of Brede and 9km NNE of Hastings town centre (East Sussex). 17.ix.72
 728. 835486 - Chalk edge stream 2.5km E of Sutton Valence and 4.5km N of Headcorn (Kent). 11.v.75
 729. 837102 - Stream in Ecclesbourne Glen 2km ENE of Hastings town centre (East Sussex). 24.iv.74
 730. 840104 - Stream in Ecclesbourne Glen 2.5km ENE of Hastings town centre (East Sussex). 24.iv.74
 731. 849201 - Tillingham stream 3km NE of Brede and 7.5km W of Rye (East Sussex). 17.ix.72
 732. 854217 - Woodland stream 2.5km S of Beckley and 7km WNW of Rye (East Sussex). 27.iii.77
 733. 858670 - Stream to Halstow Creek at Lower Halstow 8km E of Gillingham town centre (Kent). 11.v.74
 734. 858900 - Stream 2km W of Rochford and 5km NNW of Southend town centre (Essex). 25.iv.77
 735. 871337 - Stream 1.5km W of Tenterden and 4km NE of Rolvenden (Kent). 17.ix.72

736. 872243 - Stream 2.5km NW of Peasmarsh and 1km E of Beekley (East Sussex). 27.iii.77
 737. 873492 - Stream near Grafty Green 3.5km S of Harrietsham (Kent). 4.x.75
 738. 873515 - Lake outlet near source of River Len 1.5km SE of Harrietsham (Kent). 19.ix.74
 739. 882125 - Stream near Fairlight Cove 5.5km SW of Winchelsea (East Sussex). 20.iv.74
 740. 887480 - Stream 5km SSE of Harrietsham and 5km SSW of Lenham (Kent). 4.x.75
 741. 889504 - Headstream of Great Stour River 2km SSW of Lenham (Kent). 11.v.75
 742. 896893 - Stream 4km NNE Southend town centre and 2.5km ESE of Rochford (Essex). 25.vi.77
 743. 897422 - Stream at Ronden Castle 1.5km E of Smarden and 4km WNW of Bethersden (Kent). 4.x.75
 744. 903502 - Headstream of Great Stour river 5km W of Charing (Kent). 21.vii.73, 12.x.74
 745. 908227 - Stream 2.5km WNW of Rye and 2.5km E of Peasmarsh (East Sussex). 27.iii.77
 746. 919405 - Woodland stream 1km WNW of Bethersden on minor road to Ronden Castle (Kent). 4.x.75
 747. 927224 - Stream to River Rother at Houghton Green 2km N of Rye (East Sussex). 20.iv.74
 748. 940390 - Stream at Brissenden Green 1.5km SE of Bethersden (Kent). 4.x.75
 749. 949338 - Cradlebridge Sewer near Woodchurch 6.5km E of Tenterden (Kent). 17.ix.72
 750. 957393 - Stream 3km E of Bethersden on Ashford to Bethersden main road (Kent). 4.x.75
 751. 960438 - River Great Stour near Hothfield 5km WNW of Ashford town centre (Kent). 26.ix.70
 752. 968344 - Stream 2km E of Woodchurch and 3.5km WNW of Hamstreet (Kent). 26.iii.77
 753. 972341 - Stream 1.5km N of Kenardington 2.5km E of Woodchurch (Kent). 26.iii.77
 754. 976445 - Stream below waterfall 1km SE of Hothfield and 4km NW of Ashford (Kent). 26.ix.70
 755. 978336 - Stream 2.5km W of Hamstreet and 1.5km NE of Kenardington (Kent). 26.iii.77
 756. 990722 - Stream on Isle of Sheppey near Eastchurch 5km WNW of Leydown-on-Sea (Kent). 20.iv.85
 757. 993474 - Stream at Westwell 5km WNW of Ashford and 5km ESE of Charing (Kent). 11.x.75

Sampling sites in 100km square TR

758. 006341 - Woodland stream at Hamstreet 8km S of Ashford (Kent) [Service]. 14.ii.72
 759. 017460 - Stream below lake of Eastwell Park 3km N of Ashford (Kent). 4.x.75
 760. 032430 - River Great Stour 2.5km E of Ashford town centre near Willsborough Lees (Kent). 4.x.75
 761. 047363 - Stream in Park Wood 1km NW of Bonnington and 2km N of Bilsington (Kent). 26.iii.77
 762. 056428 - Stream at Plumpton Farm near Hinxhill 4.5km E of Ashford (Kent). 4.x.75
 763. 062356 - Woodland stream just E of Bonnington 6km W of Lynne (Kent). 26.iii.77
 764. 062491 - River Great Stour 1.5km S of Godmersham church (Kent). 26.ix.70
 765. 064510 - River Great Stour at Godmersham Park 0.5km N of Godmersham church (Kent). 21.vii.73
 766. 075433 - Stream 1.5km SE of Brook and 5.5km E of Ashford town centre (Kent). 4.x.75
 767. 081444 - Spring stream from chalk at Fishponds Farm 3.5km SE of Wye (Kent). 4.x.75
 768. 083382 - River East Stour 1.5km WSW of Sellindge on road to Aldington (Kent). 22.vii.73
 769. 085540 - River Great Stour at Bagham (= pipe outlet) 8km SW of Canterbury city centre (Kent). 21.vii.73
 770. 088614 - Stream from Blean Wood at Dargale Common 2km E of Hernhill (Kent). 20.iv.85
 771. 090549 - River Great Stour at Shalmford Street 7km SW of Canterbury city centre (Kent). 12.x.74
 772. 093637 - Stream at Yorklets 4km SW of Whitstable and 8km ENE of Faversham (Kent). 11.x.75
 773. 094377 - Headstream of East Stour River 0.5km S of Sellindge (Kent). 26.iii.77
 774. 097582 - Stream 1.5km N of Chartham Hatch and 5km W of Canterbury city centre (Kent). 12.x.74
 775. 102386 - Stream near Moorstock 1km E of Sellindge and 7km NW of Hythe (Kent). 26.iii.77
 776. 108390 - Stream near Moorstock 2km NE of Sellindge and 6.5km NW of Hythe (Kent). 26.iii.77
 777. 108628 - Seepage stream in Nature Reserve wood at Pean Hill 2km NW of Blean (Kent). 20.iv.85
 778. 112617 - Stream 5.5km S of Whitstable and 1.5km NW of Blean (Kent). 11.x.74
 779. 123414 - Stream draining chalk downs at Stowting 4km W of Lynne (Kent). 22.vii.73
 780. 123417 - Stream at Stowting 4km WNW of Lynne and 2km E of Brabourne (Kent). 19.ix.74
 781. 123580 - Stream to Great Stour River at Harbledown 2.5km W of Canterbury (Kent). 12.x.74
 782. 124387 - Pond outlet at Hayton Manor 1km NW of Stanford and 5km NW of Hythe (Kent). 26.iii.77
 783. 127649 - Stream 2.5km SE of Whitstable and 1km SW of Chestfield (Kent). 11.x.74
 784. 128374 - Stream near Westenbanger 1km S of Stanford and 4km NW of Hythe (Kent). 26.iii.77
 785. 139626 - Stream in Cane Wood near Tyler Hill 5km N of Canterbury city centre (Kent). 20.iv.85
 786. 152645 - Stream from Thornden Wood 4.5km SW of Herne Bay town centre (Kent). 20.iv.85
 787. 164597 - River Great Stour near Sturry 2.5km NE of Canterbury city centre (Kent). 22.vii.73
 788. 168661 - Stream at Bullockstone 2km SSW of Herne Bay and 1.5km W of Herne (Kent). 20.iv.85
 789. 176375 - Stream from South Downs at Frogholt 4km WNW of Folkstone town centre (Kent). 21.vii.73, 20.iv.74
 790. 176593 - Stream 0.5km SSW of Fordwich and 2.5km ENE of Canterbury city centre (Kent). 20.iv.85
 791. 192625 - Stream 2km NE of Sturry and 1.5km N of Westbere (Kent). 22.vii.73
 792. 195555 - Nail Bourne at Bekeshourne village 5km ESE of Canterbury city centre (Kent). 26.ix.70
 793. 205656 - Stream 4km SE of Herne Bay town centre and 1.5km N of Hoth (Kent). 12.x.71
 794. 215582 - Nail Bourne 1km NE of Littlebourne and 7km E of Canterbury city centre (Kent). 12.x.74
 795. 217584 - Nail Bourne between Wickhambreau and Littlebourne (Kent). 21.vii.73
 796. 221587 - Nail Bourne at Wickhambreau 7.5km E of Canterbury city centre (Kent). 12.x.74
 797. 240574 - Stream at Wingham on road midway between Canterbury and Sandwich (Kent). 26.iii.77
 798. 275576 - Stream 1.5km SW of Ash and 6km W of Sandwich (Kent). 26.iii.77
 799. 279435 - Chalk stream 1.5km SW of Temple Ewell and 3km NW of Dover town centre (Kent). 26.iii.77
 800. 286437 - Chalk stream at Temple Ewell 4.5km NW of Dover town centre (Kent). 19.ix.74

***Paracraspedothrix montivaga* Villeneuve and *Carcelia bombylans* Robineau-Desvoidy (Diptera, Tachinidae) new to Britain**

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Summary

The first British records for *Paracraspedothrix montivaga* Villeneuve, 1919 and *Carcelia bombylans* Robineau-Desvoidy, 1830 are given, together with notes on their current British distribution.

In the autumn of 2001 CMR (co-organiser of the Tachinid Recording Scheme) was asked to help with the identification of some difficult tachinids. After having problems running them through the standard British key (Belshaw 1993) and the Central European key (Tschorsnig and Herting 1994) it was decided to send them to Hans-Peter Tschorsnig, the foremost expert on Palaearctic Tachinidae. The identification of the first specimen came back as *Carcelia bombylans* Robineau-Desvoidy and the second group of specimens as *Paracraspedothrix montivaga* Villeneuve.

***Carcelia bombylans* Robineau-Desvoidy, 1830**

Carcelia bombylans has been included on the British list previously and was recognised as British by van Emden (1954), but Belshaw (1993) corrected this and the species was removed from the list because it was discovered that the specimens had been misidentified. The species now returns to the British list based upon a specimen taken by DG at Tucking Mill (ST 7661) in Somerset (V.C. 6) on 16 July 2001. The site is an Avon Wildlife Trust reserve consisting of two small herb-rich meadows on the Jurassic limestone. *Carcelia bombylans* is found throughout Europe north to Finland and the hosts seem to be larvae of Arctiidae - warm, dry localities are favoured (Tschorsnig and Herting 1994).

***Paracraspedothrix montivaga* Villeneuve, 1919**

Paracraspedothrix montivaga has never been recorded from the British Isles but is locally frequent throughout temperate Europe to northern Scandinavia. This species is added to the British list based on a group of specimens collected in a Malaise trap run jointly by Jim Brock (Horniman Museum) and John Pontin on Horsell Common, Surrey during 2000 and processed by GAC in 2001. It is hardly ever taken outside Malaise trap surveys and the host is unknown (Tschorsnig and Herting 1994). Subsequently we have seen material from several other sites in central and southern England, not all from Malaise traps - see below.

Specimens of *Paracraspedothrix montivaga* have been donated to the BENHS collection at Dinton Pastures. The single *Carcelia bombylans* is in DG's collection. It is suggested that both species provisionally be given RDBK status until more is known about their distribution.

The Tachinid Recording Scheme database and recording cards have been updated to reflect these changes and are available on-line at <http://www.tachinidae.org.uk>

Updates to Belshaw (1993)

The genus *Carcelia* is difficult to key because the key features seem to be quite variable so we intend to produce a completely revised key to the British *Carcelia* in due course. In the mean

time *Carcelia bombylans* can be added by modifying couplet 5 on page 43. The existing couplet 5 should be renumbered 5b and the following couplet should be inserted above it:

5a	Postpronotal lobe (seen from the side, under the dusting) completely or predominantly yellow. Frons 0.53 - 0.61x as wide as one eye. 0.63 - 0.71x in females. Dusting yellowish-grey to golden yellow.	Carcelia bombylans
-	Postpronotal lobe totally or predominantly black (at least in its anterior half). Frons in males and females either narrower or wider than the measurements given above. Dusting grey to yellowish-grey	5b

Paracraspedothrix montivaga can be added by modifying couplet 149 on page 34:

149a	Scutellum with the most apical pair of marginal bristles arranged parallel to each other or diverging (fig. 129)	149b
-	Scutellum with the most apical pair of marginal bristles crossed	150
149b	Scutellum with two pairs of marginal bristles – apicals and basals. [Abdominal tergites 1+2 with only one pair of median marginal bristles. Grey brown species usually with orange spots on the side of the abdomen]	Solieria (p. 57)
-	Scutellum with three pairs of marginal bristles – long apicals and basals with a smaller subapical pair between them. [Abdominal tergites 1+2 with a row of small marginal bristles, difficult to distinguish from the hairs around them. Dark coloured species with partial, faint grey dusted bands across the tergites.]	Paracraspedothrix montivaga

***Paracraspedothrix montivaga* Villeneuve confirmatory characters**

Body length: 2.0 - 3.5 mm.

Head (Fig. 1): Eye bare. Arista bare, second aristomere only slightly longer than wide. Parafacial area (cheeks) bare. Frons about as wide as an eye. Back of head with some pale hairs in lower half (not easy to see!). Mouth-edge pulled forwards, visible from the side. Palp dark brown/black. Facial ridge with only a few bristles above vibrissa. Antenna in male strongly triangular, apical width 10 times width of parafacial area at mid-height.

Thorax: Prosternum hairy at edges. Acrostichal bristles scarcely distinguished from hairs, except for a fairly obvious prescutellar pair. Two pairs of presutural dorsocentrals, the anterior one not much more than half the length of the posterior one. Three pairs of postsutural dorsocentrals. Three pairs of scutellar bristles: subapical scutellar bristles long and strong, parallel, close together at base, apicals absent or hair-like. Prealar bristle shorter and weaker than second notopleural.

Wing (Fig. 6): Veins bare of bristles; except radio-cubital node, which has 2-3 bristles of similar length (about as long as cross-vein r-m) (Fig. 7). Wing without a petiole (medial vein separate from R₄₊₅ at wing margin). M gently angled, rather rounded, about 150°: the final

section straight. Cross-vein m-cu at least as long as final abscissa of Cu; right-angled to Cu. Haltere pale yellow, almost luminous

Legs: Black. Mid-tibia with one antero-dorsal bristle.

Abdomen: Shiny black, tergites with narrow, interrupted, band of dusting on anterior edge. Tergite 1+2 excavated to middle. Tergites 1+2, 3 and 4 each with a pair of median marginal bristles; those on 1+2 weaker than the others and less easily distinguishable from surrounding hairs. No discal bristles on T3 or T4. Sternites 4-5, Fig. 2. Genitalia Figs 3-5.

Similar species: *Phytomyptera cingulata* (Robineau-Desvoidy, 1830) is another small black fly with narrow, interrupted, bands of dusting on the tergites. It differs from *Paracraspedothrix* in that the mouth-edge does not project forwards beyond the base of the vibrissae, the second aristomere is about four times as long as wide, cross-vein m-cu is shorter than the final abscissa of Cu and the bend in M is a distinct and sharp angle with the final section curving away from the costa. The radio-cubital node has a single long bristle (Fig. 8), about twice as long as cross-vein r-m, occasionally with a much smaller second one (these may, of course, be lost in Malaise caught material). These species are not closely related as *Paracraspedothrix* belongs to tribe Blondeliini of subfamily Exoristinae while *Phytomyptera* (formerly known as *Craspedothrix* Brauer & von Bergenstamm) belongs to the subfamily Tachininae.

British records of *Paracraspedothrix montivaga* (determined by GAC and/or CMR, confirmed by Hans-Peter Tschorsnig):

SURREY: Horsell Common (TQ 007608), 6-14.viii.2000 1♀ (may have been more); 14-21.viii.2000 1♂, 2♀; 21-28.viii.2000 2♀; 11-18.ix.2000 1♂ (all Malaise trap, A.J. Pontin); Kew Gardens, Richmond (TQ 177764), 20-27.vii.2001 1♀, Malaise trap, D.W. Baldock; Battersea Park (TQ 283771), 5.vii-20.viii.2001 1♀, Malaise trap, R.A. Jones.

BERKSHIRE: Speen Reservoir (SU 4667), 14.viii.2001, Martin Townsend.

OXFORDSHIRE: Shotover Hill Reserve (SP 562060): 24.vii-18.viii.2000 1♀; 18.viii-25.x.2000 1♀, Ivan Wright.

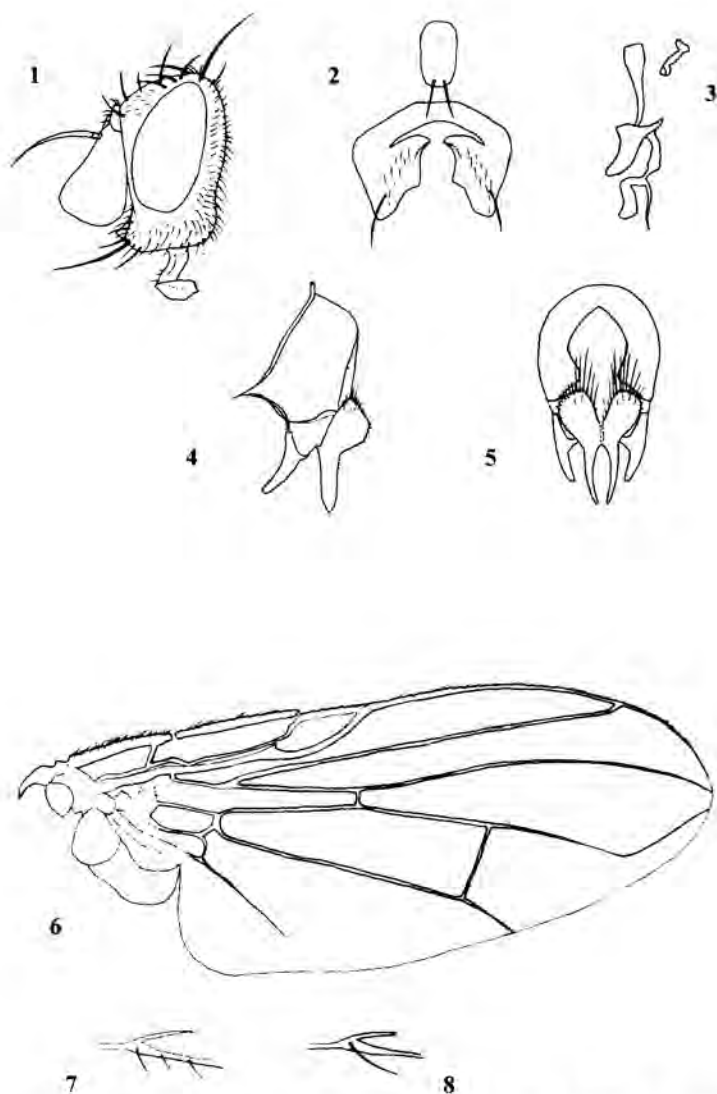
WARWICKSHIRE: Wolford Wood (SP 239335), 11.x.2001 2♀, M.N. Pugh and P.J. Chandler; Shirley, Solihull (SP 111781), 13.xi.2001 1♀ and (SP 104779) 24.v.2001 1♀, M.N. Pugh.

Acknowledgements

The authors would like to thank Hans-Peter Tschorsnig for determining the specimens and for allowing us to use some couplets from his keys. GAC would also like to thank Jim Brock at the Horniman Museum and John Pontin, David Baldock and Richard Jones for access to the Malaise trap catches that yielded specimens of *Paracraspedothrix*. DG would like to thank the Avon Wildlife Trust for commissioning the work at Tucking Mill. CMR would like to thank all collectors for submitting their records to the scheme and, in particular, Thames Water for allowing us to publish their record. The Wolford Wood specimens were taken on the Dipterists Forum 2001 Autumn Field Meeting and the collectors wish to thank the owners for permission to visit the site and Steven Falk for arranging access to this and other sites visited during the meeting.

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Figs 1-8. *Paracraspedothrix montivaga* Villeneuve. 1, head of male (lateral view); 2, sternites 4 and 5; 3-5, male genitalia: 3, aedeagus (lateral); 4 and 5, epandrium, cercus and surstylus (4, lateral, 5, ventral); 6, wing (underside); 7, few scattered hairs from the node R_{4+5} .

Phytomyptera cingulata (Robineau-Desvoidy). 8, single bristle on node R_{4+5} .

Recent records for *Cistogaster globosa* (Fabricius) and *Phasia barbifrons* (Girschner) (Diptera, Tachinidae) in Berkshire

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Summary

Records detailing a new British site for *Cistogaster globosa* (Fabricius, 1775) and *Phasia barbifrons* (Girschner, 1887) (Tachinidae) are given, together with a note of their current British distribution.

In 2001 Thames Water Plc commissioned entomological surveys of several sites owned by the company. Fieldwork was undertaken by Martin Townsend and insects from a range of orders were collected by a variety of methods including sweeping, hand netting and Mercury Vapour light trapping. Initial sorting of the Diptera to family level was undertaken by John Ismay at Oxford University Museum, with the Tachinidae being passed to one of us (CR) for identification to species.

One of the sites surveyed was Speen Reservoir near Newbury in Berkshire (SU 4667, V.C. 22). This site is adjacent to the River Kennet and holds a mixture of rank, marshy vegetation which floods in winter, together with areas of drier, ungrazed calcareous/neutral grassland. Tachinid flies identified from a sample taken on 14 August 2001 included specimens of *Cistogaster globosa* (Fabricius, 1775) (1 female) and *Phasia barbifrons* (Girschner, 1887) (2 females).

Cistogaster globosa is a parasitoid of shieldbugs of the genus *Aelia* (Hemiptera, Pentatomidae) and has been reared from *Aelia acuminata* (Linnaeus), *A. rostrata* Boheman and *A. sibirica* Reuter. Of these, only *A. acuminata* is known from Britain. *Cistogaster globosa* (as *Gymnosoma*) was allocated RDB1 status by Shirt (1987) and Falk (1991). The most recent review (Falk and Pont *in preparation*) has provisionally accorded the species RDB2 status. In the warmer parts of central Europe it is apparently taken quite commonly (Tschorsnig and Herting 1994), though the species has always been very local in Britain. The few records known to the Tachinid Recording Scheme come from scattered sites in southern England and Wales, with the fly appearing to favour dry grassland habitats where its hosts are predominantly found. Speen Reservoir is a new site for this species.

Phasia barbifrons was added to the British list on the basis of specimens collected in Kent and Surrey (Clemons 2001), with further records coming from Surrey in 2001 (Chandler 2001). The Tachinid Recording Scheme currently has records of this species from eight sites in Kent and Surrey. Speen Reservoir is the first Berkshire record for the species and the most westerly British location known to date. Identification of *P. barbifrons* may pose a problem as it is not included in the current RES key (Belshaw 1993) and may therefore be overlooked. Clemons (2001) provided a modification to the *Phasia* key in Belshaw (1993), which will allow identification of the species, which is covered in the Central European Tachinidae key by Tschorsnig and Herting (1994).

Acknowledgements

The authors would like to thank Thames Water Plc and Martin Townsend for giving permission to publish these records.

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***Ceromya flaviseta* (Villeneuve) (Diptera, Tachinidae) recorded in**

Oxfordshire – *Ceromya flaviseta* (Villeneuve) was added to the British list by J. Ismay (1998. *Dipterists Digest (Second Series)* 5, 28-29) based on material taken from Burnham Beeches, Buckinghamshire in 1995. In 2001 (27.v-2.vi) I ran a Malaise trap on the Warburg Nature Reserve, Oxfordshire (SU 719880), which produced one female *Ceromya flaviseta*, apparently only the second British record. Very little is known about this species and it seems to be rare wherever it occurs in Europe – the host is unknown but it is presumed to be a parasitoid of Lepidoptera larvae (H.-P. Tschorsnig and B. Herting 1994. *Stuttgarter Beiträge zur Naturkunde. Serie A (Biologie)* 506, 170 pp.). In the key by R. Belshaw (1993. *Handbooks for the Identification of British Insects. Tachinid Flies*. 10 (part 4a)) it runs to *Aphantorhaphopsis verralli* (Wainwright, 1928) but *C. flaviseta* differs from this species in that the anal vein does not reach the wing margin and it has hairs all along vein R₁. The Malaise trap was sited on the edge of a sunny chalk downland ride, backing onto an area of thin scrub. I would like to thank the owners, the Wildlife Trust for Berkshire, Buckinghamshire and Oxfordshire (BBOWT), for permission to survey the site – **CHRIS RAPER**, 46 Skilton Road, Tilehurst, Reading, Berks, RG31 6SG E-mail: chris.raper@tachinidae.org.uk Web site: <http://tachinidae.org.uk>

A new species of *Odinia* (Diptera, Odiniidae) from Scotland

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Summary

A new species of Odiniidae which shows similarities to *Odinia pomona* Cogan is described as *O. betulae* sp. n. from specimens taken on birch polypore in north-western Scotland

In July 1992 one of us (IM) visited Dundonnell Woods SSSI (NH 1185), Wester Ross, Scotland to search for saproxylic Diptera. On the underside of a polypore fungal fruiting body protruding from the trunk of a birch (*Betula pubescens*) tree, a number of greyish acalypterate flies were encountered apparently feeding on the fungal spores.

These flies were readily identified as a species of *Odinia* Robineau-Desvoidy (Odiniidae) and they ran to *Odinia maculata* Meigen in the key to the British species of this family by Collin (1952). However detailed examination showed that they differ from that species in a number of important characters: palpi orange; middle legs with two ventral apical spurs subequal in length; third antennal segment with a dark apical spot; hind femora and tibia short and thick. The Wester Ross material most closely resembles a British species described in 1969, *Odinia pomona* Cogan, particularly with respect to the presence of short and thickened hind legs. However on comparison with *O. pomona* adults we were able to determine that a previously unrecognised species exists. In this paper we describe the male of this new species.

Odinia betulae sp. n.

Description

Terms follow Collin (1952) and Cogan (1969).

Male. *Head:* Eyes bare. Antenna: scape and pedicel black except for extreme dorso-apical margin of pedicel which is grey dusted; antennal segment 3 predominantly yellow with a dorso-apical dark blotch (Fig. 1), apex rounded or angular (one paratype). Arista dark with basal third yellow. Frons and vertex grey with apical margin narrowly orange; setulae present bordering pale central area; setulae absent between third orbital and vertical bristles. Lunule orange. Face and cheek dark grey with orange stripe across cheeks and mouth edge. Eye about as wide as long (Fig. 1). Three (of which one is very small), upcurved bristles on each side of buccal margin. Palpi orange with 4 apical bristles.

Thorax: grey dusted with central indistinct brownish mesonotal vitta and two very indistinct vittae along the lines of the dorsocentrals. Humerus orange and side of thorax with indistinct pale markings. Mesonotal setulae in 6-8 irregular acrostichal rows. Upper edge of katepisternum with four strong bristles, the anterior one of these being the longest, at approximately the length of the front tibia. *Wing* (Fig. 5): infuscated areas variable in size and shape, particularly on outer crossvein; 2nd vein pale orange. *Legs:* front leg orange with outer face of femur coated with greyish dust and bearing rows of long, black setae; front tibia with dark rings at base and apex; first tarsomere dark; middle leg (Fig. 3) orange except for coxa which is grey and tibia with dark rings at base and at apex with two ventral apical spurs, the anterior one only very slightly longer than the posterior; hind leg (Fig. 2) markedly incrassate (short and thickened), coxa grey, trochanter yellow, femur shiny black with some grey dusting and lateral yellow markings at apex, two short spines at apical third on the anteroventral surface; tibia with dark rings at base and apex; tarsus dusky orange.

Abdomen: tergites 2-5 with two pairs of brown markings. Covered generally with irrorated setae: these setae black. **Genitalia:** (Fig. 4), epandrium bearing thickened apical notch, aedeagus similar to that of *Odinia boletina* (Zetterstedt)

Wing length 3.5-3.7mm, body length 3.5-4.0mm.

Female: Unknown

Material examined. Holotype ♂, Scotland Wester Ross, Dundonnell, Dundonnell Woods SSSI (NH 1185), taken from the underside of a birch polypore fungus *Piptoporus betulinus*, 2.vii.1992. I. MacGowan.

Paratypes 2 ♂, same data as for holotype. Holotype and paratypes in the collections of the National Museums of Scotland.

Etymology. *Odinia betulae* is named after its association with birch woodland, within which the original specimens were collected.

Discussion

With darkened basal antennal segments, no hairs near eye margin between the posterior orbital and vertical bristles and a rather dark disc to the thorax *O. betulae* most closely resembles *O. pomona* and *O. maculata* in the British fauna.

Odinia betulae shares with *O. pomona* incrassate hind legs (Fig. 2) but it differs from that species in a number of characters. It appears darker with vittae on the thorax only vaguely indicated: it only has a narrow, orange margin to the frons, a clearly defined dark apical mark on the third antennal segment rather than a vague lateral stripe across the segment as in *O. pomona* and the cheeks are grey-dusted, not orange as in *O. pomona*. In addition, the abdominal setae are black in *O. betulae* whereas in *O. pomona* pale setae are present. Finally, the middle tibiae bear a pair of tibial spurs in *O. betulae* but only a single spur is present in *O. pomona*.

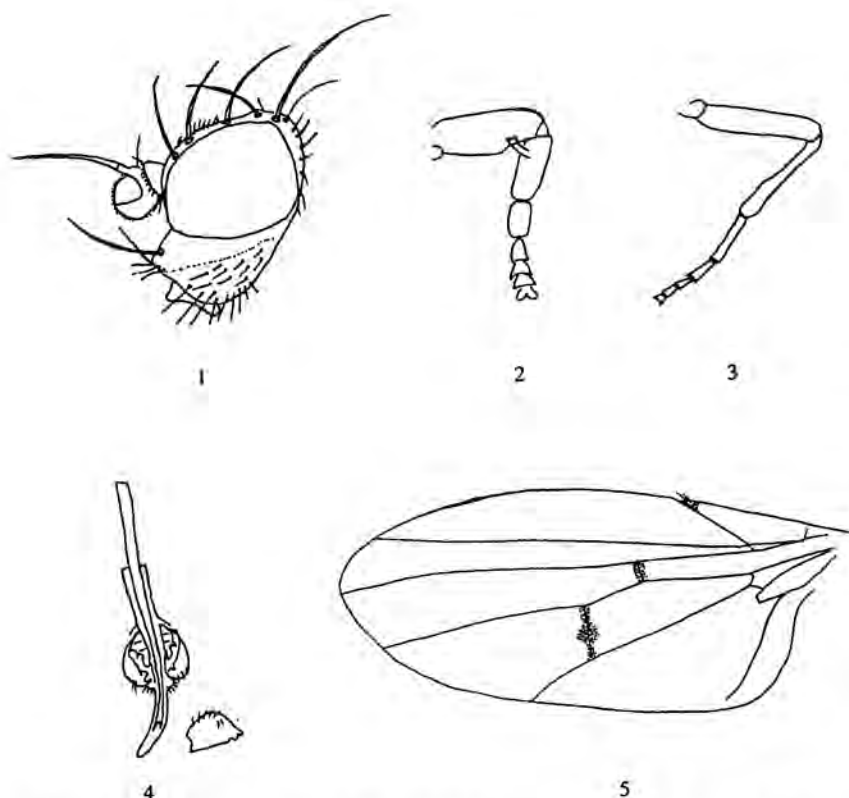
Odinia betulae differs from *O. maculata* in that it has a discrete dorso-apical darkened area on the third antennal segment rather than the larger dark area in *O. maculata* and in having orange palps, rather than darkened as in *O. maculata*.

Recently, a similar species, *Odinia trifida* has been described from Spain (Carles-Tolra 1996). This species, *O. pomona* and *O. betulae* all key out close to *O. maculata* in the key by Collin (1952). The incrassate hind legs separate *O. pomona* and *O. betulae* from *O. trifida*. In addition, from the description of the species, *O. betulae* differs from *O. trifida* in the colour of the third antennal segment: in *trifida* a lateral stripe appears, similar to that of *pomona* and the apex of the epandrium bears three apical projections which do not appear in *O. betulae* (Fig. 4).

Odiinids are well known to occur on or around fungal fruiting bodies on trees and close to sap runs (Collin 1952). The larvae of most species reared to date are associated with dead or dying trees and occur under the bark in association with galleries of wood-boring insects where they may be facultative predators or saprophages but include necrophagy (Ferrar 1987). When first encountered, adults of *O. betulae* were apparently feeding from the under surface of a polypore fungus growing from the trunk of a live *Betula* tree, behaviour commonly observed in *O. boletina* which is usually found under brackets of *Ganoderma* species. Unfortunately no other details of the life cycle or history of this species were recorded.

Acknowledgements

We are grateful to John Ismay and George McGavin for their assistance and access to the Collin-Verrall collection at the University Museum, Oxford and to Nigel Wyatt for access to material at the Natural History Museum, London.



Figs 1-5. *Odinia betulae* sp. n. 1, Lateral view of head; 2, anterior view of hind leg; 3, anterior view of mid leg; 4, aedeagus and associated structures, with epandrium shown to one side; 5, wing.

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Old Lancashire (V.C. 69) records of *Empis (Platyptera) borealis* Linnaeus, 1758 (Diptera, Empididae) - During early spring hoverfly visits by DS

(with L. Gorman) in 1991 to the shallows in the parish of Lower Allithwaite (now Cumbria, once Lancashire) specimens of *Empis* (subgenus *Platyptera*) *borealis* Linnaeus were taken. The first was found at Reake Moss (= Ellerside Moss) (SD 343794), part of the series of mosses running south from Roudsea Wood NNR on 2 April 1991 and the second, a mating pair with prey, by the Cumbria Coastal Way north of the road at Speel Bank (SD 361808) on 14 April 1991.

Roy Crossley kindly identified the material at the Preston Montford Dipterists Forum Workshop last year, remarking that he had had to travel to northern Scotland to see this species. He later checked for records in Yorkshire and Lancashire and discovered the following: Skelwith Fold, near Windermere (V.C. 69), Alan Brindle, April (no year), "l. c. at sallow", the sole record in *The Diptera of Lancashire & Cheshire* pt. I (1959) by L.N. Kidd and A. Brindle (Lancashire & Cheshire Fauna Committee). The only Yorkshire record is Austwick (Silverstone plantation), 18 May 1933, C.A. Cheetham, and there is a note on the record card "A.E. Wright, Witherslack 5/5/23" (R. Crossley *pers. comm.*).

Curiously it was Albert Wright's hoverfly records that prompted the exploration of the Lower Allithwaite area at that time of year. We know of no empid collection by that gentleman (although we happen to know he was collecting *Heringia heringi* (Zetterstedt) and *Dasyrphus tricinctus* (Fallén) (Syrphidae) at Grange-over-Sands on that day. His entomological diaries (from January 1939 until his death in April 1950) and a log book in which he recorded his captures (and also those of the late J. Davis Ward ... Diptera mainly those in Verrall's Vol. VII) are, however, in the possession of NB and DS contacted him accordingly. There is no reference in these to the record of *Empis (Platyptera) borealis* at Witherslack on 5 May 1923, but A.E. Wright was an avid collector and most of the groups he did not feel able to determine were sent to various specialists - in particular Harry Britten at Manchester Museum.

The personal experiences of NB with *E. borealis* are as follows (based on information in his diaries). On 19 April 1962 a visit was made to Meathop Moss on a quiet warm evening, when chironomids were numerous. Among a moderate swarm of *Prodiamesa olivacea* (Meigen) (Chironomidae) a couple of *E. borealis* were noted flying and feeding. The swarm was about 5 - 7m up and the sex of the empids could not be determined. They were, however, considered to be not very clever at catching the *Prodiamesa*, which were quick to take evasive action. Then on 22 April, on the Moss again, a short series of the empid was taken to confirm its identity. A pair was also found settled on a twig - the female with another *P. borealis* captured as prey and wrapped loosely in silk. Meathop Moss was visited again on 30 March 1965 when *E. borealis* was in great numbers. On 14 April 1979 a visit was made to Black Tom's Lane (the name given by the earlier entomologists to the track alongside Nicholl's Moss (SD 420825) from Caterag Cottage (SD 438824) to Slate Hill (SD 428838)) where the most evident fly was *E. borealis* and some of the flies on which they were preying were also taken. J.M. Nelson kindly identified one of the latter as *Egle muscaria* (Fabricius) (now *E. ciliaris* (Walker, 1849)) (Anthomyiidae). On 2 May 1986 and 30 April 1987 it was taken at Roudsea Wood NNR. Cumbria and NB has also taken the species on the Cairngorms, Inverness-shire on 29 May 1967.

Other Cumbria records known to us are from Moor House NNR and Dun Fell by J.M. Nelson and Cliburn on 6 April 1958 by W.F. Davidson (determined by F.H. Day).

In summary one can say that the species is a common one on areas of acid mossland in Spring - **DARWYN SUMNER**, 122 Link Road, Anstey, Leicestershire LE7 7BX and **NEVILLE BIRKETT**, Beardwood, Carter Road, Grange-over-Sands LA11 7AG

Some records and observations of Diptera in Surrey

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Summary

Some of the more significant captures of Diptera from eight families (Stratiomyidae, Syrphidae, Micropezidae, Conopidae, Tephritidae, Clusiidae and Tachinidae) made in Surrey in 2001 are summarised, including the first county record for *Myopa extricata* Collin (Conopidae).

STRATIOMYIDAE

Nemotelus pantherinus (Linnaeus). This species was swept by JD from tall fen vegetation by the River Wey at Shalford (SU 9947), 6.vi. This is the second record from the Wey catchment.

Odontomyia ornata (Meigen). This was recorded by Don Tagg at Tugley Wood (SU 9833), 30.vi.1985 and confirmed by JD in 2001. According to Morris (2000), there are no modern records from Surrey and only one old one. It should be noted that the record attributed to JD for *Ibis marginata* (Fabricius) (Athericidae) in Morris (2000) from Frillinghurst Woods (SU 9234) is in error owing to confusion with *Choerades marginatus* (Linnaeus) (Asilidae), which does occur in this wood.

Stratiomys singularior (Harris). An adult female was recorded in the conservation area at Kew Gardens (TQ 1776) on 16.vii (DB).

SYRPHIDAE

Brachypalpoides lentus (Meigen). An adult was found on a log in the conservation area at Kew Gardens (TQ 1776) on 18.vi (JD).

Ripponensia splendens (Meigen). Several males were present at ivy blossom in Thursley Village, Surrey (SU 9039), 10.ix (JD).

MICROPEZIDAE

Rainieria calceata (Fallén). Adults were abundant on old beech *Fagus* at Hatchlands Park, Surrey (TQ 0651) on 22.vi. Mating pairs were seen on the trunks of live standing trees and singletons were present on fallen boughs of large trees in partial shade (JD).

CONOPIDAE

Conops strigatus Wiedemann. One individual was found on thistles in a small area of acid grassland at The Glen, Ash ranges (SU 9252), 13.viii (JD). This species also occurred on thistles at Hankley Common (SU 8739), 26.vii (DB).

Conops vesicularis Linnaeus. There were several on forget-me-not *Myosotis* species at Horsell Common sandpit (TQ 0160), with *Myopa testacea* (Linnaeus), 10.v. (DB).

Leopoldius signatus (Wiedemann). This was found on ivy *Hedera helix*, growing in a large garden at Milford (SU 9441), 16.ix (DB).

Myopa extricata Collin. This was swept off flowers at Priest Hill, Ewell (TQ 2361), 4.v. At Kew Gardens (TQ 1776) it was swept off flowers in 'order' beds in formal gardens, 8.v. Both records were made by DB and both specimens were seen by Graham Collins and David Gibbs. Morris (2000) did not include this species in his list of Conopidae and it would appear that these records constitute the first for V.C. 17.

Myopa fasciata Meigen. This species was swept off *Erica cinerea* near an aggregation of nesting aculeates at Gapemouth Plantation, Ash Ranges (SU 9056), 14.viii (JD) and 28.viii (DB). Other records, all made by DB are as follows: Marehill (SU 9339), 30.vii; Brookwood Cemetery (SU 9656), 8.viii; Frimley G.C. (SU 9058), 29.viii; Bookham Common (TQ 1256), 1.viii. I swept in a ride.

TEPHRITIDAE

Acinia corniculata (Zetterstedt). Several were swept from common knapweed *Centaurea nigra*, growing in unimproved grassland on the site of a former brickworks at Newdigate (TQ 2042), 9.vii.2001. This species was provisionally given RDB1 status but it appears to be either on the increase or frequently overlooked, with a veritable 'glut' of recent records including my own in N. Hampshire (Denton 2001), also from sites in Sussex (Peter Hodge *pers. comm.*) and Oxfordshire (Matthew Smith *pers. comm.*).

The same site yielded numerous *Myopites inulaedyssentericae* Blot, swept from fleabane *Pulicaria dysenterica*, on 9.vii (JD).

CLUSIIDAE

Paraclusia tigrina (Fallén). Adults were present on the trunk of a large beech *Fagus*, West End Common, Esher (TQ 1262), 27.viii (JD) and 17.x (Peter Chandler). The tree had been heavily attacked by fungi and wood-boring insects. The fallen upper part of the tree again yielded adults of *Rainieria calceata* (Fallén) as in 2000 (Denton 2001).

TACHINIDAE

Cistogaster globosa (Fabricius). Several were swept in small area of acid grassland, at The Glen, Ash Ranges (SU 9252), 13.viii (JD).

Acknowledgements

Thanks are due to the National Trust for supporting survey work at Hatchlands, and to Royal Botanic Gardens at Kew for allowing us access to the park grounds.

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New generic, subgeneric and species records of Ceratopogonidae (Diptera) from Ireland

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The first modern checklist of the Irish Ceratopogonidae (Ashe *et al.* 1998) listed 44 known species in eight genera and twelve subgenera whereas in Britain there are 161 species in 20 genera and 31 subgenera (Chandler 1998), leaving considerable scope for adding additional taxa to the Irish list. Many of the potential additional genera and subgenera are widespread in Europe but have never been reported or listed as occurring in Ireland and the reason for this discrepancy is the paucity of research work on this group here.

The aim of this paper is to begin to redress this imbalance by recording four genera, a subgenus and five species, which are new to the Irish fauna. Two additional genera, including one subgenus, representing two species have recently been added (Ashe and O'Connor in press) and these combined with the five species recorded here bringing the total Irish ceratopogonid fauna to 51 species representing 14 genera and 14 subgenera. Further papers are planned which will add additional genera, subgenera and species. Unless otherwise stated, voucher specimens of the species recorded here have been lodged in the National Museum of Ireland. Abbreviations: JPOC = J. P. O'Connor; PA = P. Ashe; PJC = P. J. Chandler. Irish grid references are given in brackets after each locality.

Neurohelea luteitarsis (Meigen)

In all cases single female specimens were collected on 15.vii.1971. Newry Forest, Co. ARMAGH (J0-2-) (PJC) in a conifer plantation; on 24.vi.1975. Whaleyabbey, Co. WICKLOW (T1784) (PJC), in mixed woodland and on the 4.vii.1969. Owenreagh River valley, Co. KERRY (V8779) (PJC), in a wooded bog.

Abroad, the species has been recorded from Belgium, Germany and Great Britain (Remm 1988). Edwards (1926) stated that it was rather common in the west and north of Britain, but it is also found at scattered damp woodland sites in the South East of England with recent records from Berkshire and Surrey.

Probezzia seminigra (Panzer)

Live pupae collected on 14.viii.2001 on the lakeshore of Lough Ree, near Lanesborough, Co. LONGFORD (N0068) (JPOC) from which 4♂ emerged on 20.viii.2001; five pupae collected on 7.viii.2001 on the lakeshore of Ballaghacker Lough (Hollygrove Lake), Co. GALWAY (M7857) (JPOC) from which 15♂ and 8♀ emerged from 8 to 14.viii.2001; several live pupae collected on 28.vi.2001 on the shoreline at Castleburke, Lough Carra, Co. MAYO (M165772) (PA and JPOC), from which male and female adults hatched over subsequent days; 2♂ on 10.vi.1985 in an area of scrub and marsh at Lough Derravaragh, Co. WESTMEATH (N4-6-) (PJC).

Abroad, the species is widely distributed and occurs in North and Central Europe, the forest zone of the former U.S.S.R. and North America (Remm 1988). It is also locally frequent around lake margins in Britain.

Schizohalea leucopeza (Meigen)

A single adult female caught on 28.vi.1987, Lough Ballynafid, Co. WESTMEATH (H4160) on the open shore (PJC).

Abroad, the species is very widely distributed and occurs in Europe including the North and Central European territories of the former U.S.S.R., the Transcaucasus, the Far East and Middle Asia regions of the former U.S.S.R., Tunisia in North Africa and North America (Remm 1988).

Sphaeromyia fasciatus (Meigen)

A single female was collected on 25.vi.1987 at Castlecomer, Co. KILKENNY (S5474) by a pool in mixed woodland (PJC).

Abroad, the species is widely distributed and occurs in northern and central Europe including the North and Central European territories of the former U.S.S.R., Siberia and the Far East (Remm 1988). It is frequent around lakes and gravel pits in southern England.

Stilobezzia (Acanthohalea) lutacea Edwards

An adult female was captured on 22.vi.1975 at Marl Bog near Dundrum, Co. TIPPERARY (R9544) (PJC).

Abroad, the species has been recorded from France and Great Britain (Remm 1988). The British record is based on the type material; Edwards (1926) described *lutacea* from both sexes but did not state how many specimens, giving only the data "Porthcawl, Glamorgan (Yerbury)". We are not aware of more recent British records.

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Advances in the understanding of the *Platycheirus scutatus* (Meigen) complex in Britain, including the addition of *Platycheirus aurolateralis* sp. n. (Diptera, Syrphidae)

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Summary

The *Platycheirus scutatus* (Meigen, 1822) complex is shown to include a third species in Britain, *P. aurolateralis* sp. n. in addition to *P. scutatus* and *P. splendidus* Rotheray, 1998. New characters for the recognition of species in this complex and a key to the males of the three species are given.

For much of the 20th Century *Platycheirus* had a well understood and stable list of species, certainly as regards temperate latitudes of western Europe. However, critical studies have revealed a number of species complexes, i.e. previously morphologically well defined species have been shown to comprise two or more closely related species and as a result the British list has risen from 15 species to 21 with respect to the definition of subgenus *Platycheirus* as given in Stubbs and Falk (1983).

Platycheirus scutatus (Meigen.) and *P. albinus* (Fabricius) both have distinctive tufts of long wavy hairs near the base of the front femora in the males, and it was easy to separate those two species even in the field although misfit '*P. scutatus*' have been known for a number of years. A specimen from Windsor (in my collection) with practically spot-free tergite 2 was noted in *British Hoverflies* (1983) in the text to *P. scutatus* (typically marked as in Fig. 1) but further material was desirable to progress the taxonomy. In the late 1990s Mick Parker briefly showed me two 'different' *P. scutatus* complex specimens that he had collected in Dorset; these were held in mind for future detailed examination. After several years of uncertainty over the nature of some reared material, Rotheray (1998) described *P. splendidus* as a new species but the distinguishing characters were not always easy to apply. It was provisionally assumed that the Dorset specimens belonged to *splendidus*, but on calling-in Parker's material and some of Rotheray's examples of *splendidus*, it was soon clear that a third species allied to *P. scutatus* was involved. In particular the middle tibiae had good characters that had not been recognised before.

In this paper I describe the new species and further characterise the differences between the three species. A key to separate the males is provided following the description of the new species. Some variation in the other material examined is discussed and paratypes are not designated since there is a possibility of further species remaining unrecognised.

***Platycheirus (Platycheirus) aurolateralis* sp. n.**

Male. Head. Slightly wider than thorax: eyes bare, in contact for a distance equal to that from edge of front ocellus to occiput: frons inflated, almost matt black (only faintly shining), with erect black hairs, angle of approximation of eyes about 120°: face about half as broad as head: facial knob projecting as far as or just beyond upper mouth edge, upper mouth edge protruding: cheeks with mostly black hairs and sparsely covered with whitish dusting, so that the black ground colour is obvious: centre of face, including facial knob, with a vertical shining black stripe which is about a quarter as wide as face viewed from above: antennae with small ventral yellow markings at the bases of segments 2 and 3, otherwise black: arista with minute hairs visible at high magnification (X30).

Thorax. Mesonotum and scutellum moderately shining black, with erect yellow hairs; notopleural area and humeri with golden reflections (when viewed obliquely from behind with light source from in front); wing membrane entirely covered in microtrichia; halteres yellowish with brown tinged knob.

Legs. Front tarsus (Fig. 7) whitish yellow above (with ghosting of darker ventral markings showing through); first segment little longer than apical width; second segment equally wide, 4 times as wide as long, parallel sided; third segment very similar, just over 3 times as wide as long and only very slightly tapered on outer (posterior) side; segment 4 over twice as wide as maximum length, tapering on outer side. Front tibia (Fig. 12) dilated just before tip, pale except for posterior dark fringe, which bears a row of longish hairs, those just beyond half way clumped. Front femur black except at apex, two clumps of wavy blackish hairs and a clump of whitish hairs at base. Front trochanter with a margin of short, stiff yellow hairs. Mid tarsus with basal segment blackish, the rest fuscous. Mid tibia (Fig. 10) mainly blackish except for narrow yellow base and apex; in dorsal view mildly swollen in middle and with many long hairs on the anterior surface in the basal half and long hairs for most of length on posterior surface; in side view bent near apex, narrowest in basal half, the anterior hairs drooping to partially mask erect even length ventral hairs which are most clearly visible toward the apex; mid femur mainly black beneath, otherwise yellow in basal third and at apex, the rest black except for a narrow yellow anterior stripe; mid trochanter with a pair of pellucid projections with the apices black. Hind legs black except for knees.

Abdomen (Fig. 5). Dull black with pale yellow pubescence, which becomes shorter towards the tip. Tergite 2 with only a tiny trace of spots present in holotype (without spots in some other material); tergites 3 and 4 with rather narrow oblique dull yellow spots which appear to reach sides but stop short of true margin which rolls beneath; tergite 4 shining on hind margin; tergite 5 more metallic and entirely black (in holotype; with a tiny lateral yellow spot on one or both sides in some other material); sternites moderately shining blackish. Genitalia not examined (see note below).

Body length (front of frons to end of abdomen) 7.5mm; wing length 6.5mm.

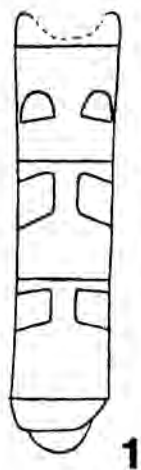
Female. Unknown.

Type material. Holotype ♂, England, Berkshire, Windsor Forest, 1.vi.1975, A.E. Stubbs, deposited in Natural History Museum, London (BMNH).

Other material examined. ENGLAND: 2♂, Bristol, 22-28.vii.1972, E.A. Fonseca (BMNH); 1♂, Bristol, 4-12.viii.1985, E.A. Fonseca (BMNH); 1♂, Buckinghamshire, Slough, 18.v.1936, O.W. Richards (BMNH); 1♂, Devon, Watersmeet, SS 743485, 28.iv.1989, S.P.L. Franks (Liverpool Museum); 1♂, no data (Liverpool Museum); 1♂, Dorset, Delcombe Wood, 3.v.1997 and 1♂, 30.v.1997, M. Parker collection.

Other records (material not examined). ENGLAND: 1♂, Middlesex, Wealdstone, garden, 4.vi.1980; 1♂, Huntingdonshire, Holme Fen NNR, drained fen woodland, 28.viii.1992; 1♂, Warwickshire, Coventry, Foleshill Gasworks, post-industrial site, 7.iv.1998 (all S. Falk).

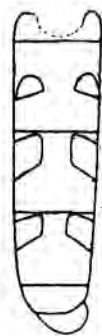
Figs 1-13. 1, 2, 8, 11, *Platycheirus scutatus* (Meigen). 3, 4, 9, *P. splendidus* Rotheray. 5, 7, 10, 12, *P. aurolateralis* sp. n., holotype. 6, 13, *P. aurolateralis* sp. n., Bristol. 1, 3, 5-6, dorsal view of abdomen; 2, 4, 7, dorsal view of right front tarsus; 8-10, right middle tibia: a, dorsal view, anterior side to right; b, lateral view, ventral side to right; 11, base of wing showing areas bare of microtrichia; 12-13, dorsal view of right front tibia.



1



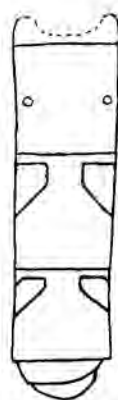
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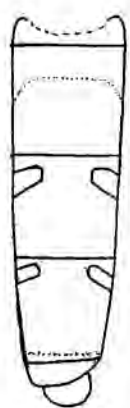
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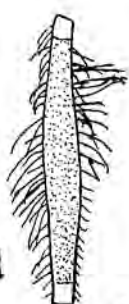


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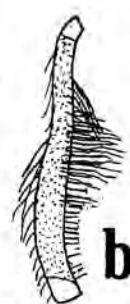


b

9



a



b

10



11



12



13

Variation. In the material here assigned to *aurolateralis*, apart from tergite 2 occasionally having tiny traces of pale spots, the spots on tergites 3 and 4 vary mainly in the shape of the front margin. In some respects the holotype is unusual in the front margin of the spots on tergites 3 and 4 being at right angles to the sides of the tergite rather than oblique and most specimens have dried so that the abdomen tapers. The specimens from Bristol are atypical (though the significance of this is uncertain) in that tergite 2, when lit from the side, is somewhat shining on the front quarter (Fig. 6) and the front tibia is more markedly splayed at the apex (Fig. 13) than in the holotype (Fig. 12).

Biology. The ecological characteristics of *P. aurolateralis* are unclear and nothing is known of its biology. Some records are for woodland, but the records from a garden and a post-industrial site indicate that it can use other habitats.

Key to males of the *Platycheirus scutatus* Complex

1. Frons grey dusted. Front tarsus (Fig. 2) with basal segment more elongate tapering. Mid tibia (Fig 8) in side view bent one third from apex and ventrally with only short hairs. Basal cells extensively free of microtrichia at base (Fig. 11). *scutatus* (Meigen)
- Frons dull black. Front tarsus with basal segment more squat. Mid tibia in side view bent in middle or near apex and ventrally with some very long hairs. Basal cells covered in microtrichia or clear areas small and less consistent in presence. 2
2. Tergites 2-4 square; tergite 2 with strong spots (Fig. 3). Front tarsus (Fig. 4) with segment 4 about twice as wide as long and highly asymmetrical. Mid tibia (Fig. 9) in side view bent in middle; rather swollen in basal half; anterior surface with long hairs at base only; ventral surface with only a few short hairs in apical half. *splendidus* Rotheray
- Tergites 2-4 slightly elongate; tergite 2 with at most vague spots (Fig. 5). Front tarsus (Fig. 7) with segment 4 over twice as wide as long and reasonably symmetrical. Mid tibia (Fig. 10) in side view bent near apex, narrowest in basal half; anterior surface with many long hairs in basal half; ventral surface with moderately long erect hairs of even length extending well towards apex. *aurolateralis* sp. n.

Discussion

Male *P. aurolateralis* look very different from the other two related species because tergite 2 lacks distinct spots and the features of the middle tibiae are distinctive as indicated in the above key. The frons is matt black (use daylight or simple table lamp, not high intensity spot light) as in *P. splendidus* (semi-shining, dusted grey in *P. scutatus*). The differences in male genitalia between *P. splendidus* and *P. scutatus*, as illustrated by Rotheray (1998), are hardly discernible so it was decided that it was not worthwhile dissecting the few specimens of *aurolateralis* to examine their genitalia.

The males of *P. scutatus* have a longer proportioned abdomen (Fig. 1) than the other two species and the frons is semi-shining under a dull greyish dusting. The middle tibia is quite different and extensively pale in the basal half and along most of the anterior surface. The tergite spots are quite strongly yellow, even if somewhat whitish dusted.

The males standing under *P. scutatus* in the British collection of the Natural History Museum were re-examined. This study revealed four specimens of the new species (two

localities, three collecting dates), 15 specimens of *P. splendidus* (12 localities/collection dates) and 58 specimens of *P. scutatus* (about 45 localities). There has also been the opportunity to examine the Liverpool Museum series under *P. scutatus*, which comprised 2 specimens of *aurolateralis* (1 with data, 1 no data), 3 specimens of *P. splendidus* (3 localities; the material referred to by Rotheray was not available for study) and 21 specimens of *P. scutatus* (21 localities). Steven Falk, who has been keeping vouchers for all records in recent years, provided further data.

Rotheray (1998), in defining *splendidus*, drew particular attention to the face profile and width of the dust free stripe on the face (as it ran vertically across the facial knob) in comparison to *P. scutatus*. Leg coloration was also noted as different, the front and middle legs of *splendidus* usually being yellowish rather than blackish beneath in both sexes of *scutatus*. These characters often proved awkward to apply with certainty, and the characteristics of a third species have now to be accommodated.

From examination of material of *splendidus* it is noted that it has a matt black frons in common with *aurolateralis* unlike the more shining dusted grey condition in *P. scutatus*. The front tarsus differs in shape. The middle tibia is quite different in shape and distribution of hairs: a dark curved dorsal furrow often shows up well against the rather paler surrounds.

Late in the preparation of this paper, my attention was drawn to a paper in Dutch by Smit (2001), which gives characters for the separation of *P. splendidus* from *P. scutatus* (and *P. albinus*). He referred to the darker frons coloration in *P. splendidus*. There is no reference to the middle tibiae but he illustrated the front legs and the very wide middle tarsal segments shown for *P. splendidus* much more closely resemble those of *aurolateralis* (indeed the fourth front tarsal segment is displayed as being as wide as the maximum width of the first segment, which is likely to be an exaggeration).

Rotheray (1998) gave details of the larval biology of *splendidus* and also placed emphasis upon the fact that it is a univoltine species, adults occurring in the spring. However, a record from Cornwall, St Erth, 8.viii.1935 (L. Parmenter, BMNH) is for August.

Larvae of *P. scutatus* are well known to attack aphids on herbaceous plants and low shrubs. Confirmed specimens in the BMNH collection include reared material from *Ribes americana* in Kent, cabbage (*Brassica oleracea*) and hawthorn (*Crataegus* species) in Berkshire and from larvae found in a grass tussock in April in Surrey. At least in the south, this species is capable of three generations per year (Rotheray 1998).

Comments on females

The application of the facial characters and leg colour features given by Rotheray (1998) seem difficult to apply as a means of separating *P. splendidus* from *P. scutatus*. Whilst females of *P. splendidus* have the front and mid femora and tibiae almost completely yellow, my impression is that *P. scutatus* (with the facial knob only narrowly dust-free) can also have this condition.

The condition of the wing microtrichia is variable in females, whereas male *P. scutatus* have more consistently clear areas on the second basal cell than in the males of *P. splendidus*.

It seems likely that female *P. aurolateralis* will be found to have dark front and middle femora so are most likely to be confused with *scutatus*. Whether tergite 2 will have the spots absent is difficult to predict.

Comparison of distribution

There would appear to be some interesting distribution patterns emerging.

P. scutatus. This is confirmed as being widespread in Britain. The BMNH material gives the impression that this species has exclusive presence in the London area, East Anglia and the South East of England more generally (where *P. splendidus* is apparently very rare). The

Liverpool Museum collection indicates that this is the commoner species in the Cheshire/south Lancashire area.

P. splendidus. This has a wide distribution in England, except for the East Midlands, East Anglia and much of the South East, whilst in Scotland it is known from Midlothian and Perthshire. In S.E. England only records from Slough, Berkshire and Horsendon Hill, Middlesex can be confirmed, but it is the dominant species in S.W. England, especially in Cornwall, judging from the BMNH collection. In Warwickshire, about three-quarters of the extensive voucher material is of this species, *scutatus* being well in the minority.

P. auroateralis. The limited available data is for the southern parts of England. Being an apparently scarce species, it is not possible to predict whether it has a wider distribution nor whether it may yet prove locally dominant.

Smit (2001) claimed *P. splendidus* to be present in the Netherlands, Belgium, France and Germany. A map of the Netherlands shows a very thin scatter of records across the middle of the country and a cluster in the south-eastern Maastricht area (whereas *P. scutatus* is very widespread and clearly a very commonly recorded species). The data for these countries will need to be re-evaluated, now that *P. auroateralis* has been recognised.

Acknowledgements

I am appreciative of loans of material from Mick Parker (Dorset) and Graham Rotheray (National Museums of Scotland). Also to the trustees and Nigel Wyatt for access to the Natural History Museum collections, and to Stephen Judd and Tom Mawdsley for access to the Liverpool Museum material during a particularly hectic last week of the collections being in a temporary warehouse. Steven Falk has kindly tested the key against his extensive Warwickshire material and provided data.

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Achalcus melanotrichus Mik (Diptera, Dolichopodidae) in Scotland

— On 4 August 2000 I took a female *Achalcus melanotrichus* Mik on the sappy overflow from a rot hole in an elm (*Ulmus procera*) in Leith, Edinburgh. The tree is one of a small group on a disused railway line, now a walkway. The rot hole is situated 2.4 metres above the level of the tree base and had formed where a branch had broken off. This species appears not to have been recorded previously from Scotland — DAVID M. ROBERTSON, 41 Claremont Road, Leith, Edinburgh EH6 7NN

Some recent records of scarce or local Diptera from the Isle of Wight

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Summary

Notes are presented on the more interesting species encountered during fieldwork on the Isle of Wight in 2000 and 2001, including nationally rare or scarce species in the families Stratiomyidae, Tabanidae, Therevidae, Acroceridae, Syrphidae, Conopidae, Tephritidae and Ulidiidae, several of which appear to be additions to the Island's fauna.

During the course of fieldwork by the author on the Isle of Wight during 2000 and 2001, a number of nationally rare or scarce species of Diptera were recorded; several of these species appear to be additions to the Island's fauna. I learned during the preparation of this article of the Dipterists' Field Meeting that took place on the Island in late June and early July 1980, a number of interesting records from which have never been published. It would be desirable to collate and perhaps publish some of these records, or at least add them to the biological records held for the island; to this end the author would be pleased to hear from anyone who attended the field meeting and has records available.

STRATIOMYIDAE

The small, brightly coloured soldierfly *Chorisops nagatomii* Rozkošný was swept from *Salix* bushes on the beach to the West of Appley steps (SZ 585808) in small numbers in late August 2001. It would appear that this is the first Island record for this nationally scarce species.

TABANIDAE

Two nationally rare (RDB3) species were recorded from the saltmarsh areas at Newtown NNR (SZ 4191 and SZ 4390). *Atylotus latistriatus* Brauer was recorded regularly in low numbers during vii-viii.2000, and were most easily found by searching flowerheads of sea lavender *Limonium vulgare*. The second species, *Haematopota grandis* Meigen, was encountered on two occasions in viii.2000. One specimen was found amongst a stand of sea lavender, whilst the second was rash enough to attack the author! Falk (1991) stated that both species have a limited saltmarsh distribution, and both are believed to have undergone considerable recent decline.

ASILIDAE

The discovery in 2001 of a thriving population of the nationally rare (RDB3) robber fly *Eutolmus rufibarbis* (Meigen) on the heathland at Mottistone Common was an important find. Up to 25 adults were seen on each of two visits in mid to late July, providing good evidence that the species is breeding here. Dry heathland with grassy areas and lightly disturbed soil is the required habitat for this declining species. Stubbs and Drake (2001) considered *E. rufibarbis* to be largely confined to the South East in England. It appears to have declined in the New Forest.

THEREVIDAE

Two sand dune species, *Acrosathe annulata* (Fabricius) and *Thereva bipunctata* Meigen, were recorded from the dunes at St. Helens Duver (SZ 6389) in 2000. These were also found at this site during the 1980 field meeting (P.J. Chandler *pers. comm.*), but appear not to have been recorded elsewhere on the Island. The nationally scarce species *Thereva plebeja* (Linnaeus) was

encountered in late May 2001 at Mottistone Common, where it was frequently seen basking on the gravel pathways close to the Long Stone at SZ 407843. This species has undergone a significant recent decline and is now largely confined to comparatively few sites in South East England. This would appear to be the first post 1970 Island record for *T. plebeja*.

ACROCERIDAE

Two species new to the Island, *Acrocera orbiculus* (Fabricius) and *Ogcodes pallipes* Latreille, were taken at Newtown (SZ 4191) by sweeping vegetation along a drainage ditch adjacent to a hay meadow during Summer 2000, surprisingly in the same sweep of the net!

SYRPHIDAE

Walters Copse (SZ 4390), which contains some good quality oak woodland, produced a number of notable woodland indicator species including *Cheilosia carbonaria* Egger, *Eumerus ornatus* Meigen, *Meligramma trianguliferum* (Zetterstedt), *Xylota xanthocnema* Collin and large numbers of *Volucella inflata* (Fabricius). St. Helens Common (SZ 6389) was found to contain a particularly strong colony of *Epistrophe diaphana* (Zetterstedt), whilst the scarce *Cheilosia barbata* Loew and *Criorhina asilica* (Fallén) were found in Borthwood Copse (SZ 5684).

CONOPIDAE

The rare (RDB3) species *Myopa extricata* Collin was "rediscovered" on chalk grassland at Knowles Farm (St. Catherine's) (SZ 4975), where individuals were found visiting the flowers of common rock-rose *Helianthemum chamaecistus* in mid-May 2000. It had previously been recorded here in the 1970s. Falk (1991) cited only two post 1970 sites for the species, one being St. Catherine's, the other in South Devon. However, discussion with D. Clements (*pers. comm.*) shows that *M. extricata* has a scattered distribution in southern England but remains a scarce species, primarily of chalk grassland. Interestingly, the author encountered *M. extricata* in good numbers on heathland at Luccombe Down in Spring 2001, where it was regularly seen, sitting at flowers of bilberry *Vaccinium myrtillus*, waiting to ambush its hymenopteran hosts. From observations made here, it seems likely that the hosts are mining bees of the genus *Andrena*, perhaps *A. cineraria* (Linnaeus). *Myopa extricata* was also encountered in numbers visiting the flowers of hawthorn *Crataegus monogyna* around the woodland edge on this site, in company with the local species *Myopa tessellatipennis* Motschulsky. A third species of *Myopa*, *M. testacea* (Linnaeus), found regularly at Borthwood Copse (SZ 5684) also appears to be a new Island record.

Thecophora fulvipes (Desvoidy) was found on Mottistone Common in late Summer 2001; it has previously been found on the Island at Sandown (29.vi.1980, P.J. Chandler). Falk (1991) described this nationally scarce heathland species as "infrequent, with few recent records." However, confusion with the more common *Thecophora atra* (Fabricius) may have led to some under-recording. Finally, the nationally scarce species *Leopoldius signatus* (Wiedemann) was found in small numbers in October 2001, basking on leaves of ivy *Hedera helix* on a roadside bush in Totland (SZ 321865). This appears to be the first record for this late flying and extremely local species on the Island.

TEPHRITIDAE

Two specimens of the RDB2 species *Chetostoma curvinerve* Rondani, found basking on ivy *Hedera helix*, in weak sun in Borthwood Copse (SZ 5684) on 8 March 2000 formed the 16th British, and first Island, records for the species. On 13 February 2001 a further specimen was basking on an ivy leaf, within a few yards of the location of the original pair so the likelihood of Borthwood Copse being a breeding site for *C. curvinerve* is high.

The rare (RDB3) species *Myopites eximia* Séguéy was found in large numbers on its host plant golden samphire *Inula crithmoides*, around the salt pans at Newtown NNR (SZ 4191). During one visit in July 2000, every accessible plant of golden samphire in the survey area was found to have *M. eximia* present. The Newtown Reserve also has common fleabane *Pulicaria dysenterica*, present in large quantities. However, a diligent search of this plant yielded only a single specimen of the dependent fly *Myopites inulaedysentericae* Blot in 2000, in Walter's Copse (SZ 4390). Survey during 2001 showed this species to be quite widespread on the Island, even occurring on sites such as Mottistone Common where the host plant is present only in small quantity. This RDB3 species appears to be undergoing a northward expansion to its range at present (Clemons 1997) and is likely to be downgraded in any future review. During early August 2001 a visit to the small area of saw-wort *Serratula tinctoria* in Walter's Copse in poor weather yielded a single example of the rare (RDB3) fly *Terellia vectensis* (Collin). This species was described as new to science in 1937; the first known specimens emerged from seed heads of saw-wort collected from Newtown in 1933. It is encouraging to find that the species still persists there. Nationally *T. vectensis* is known from a few sites in southern England and a single site in South Wales.

ULIDIIDAE

Melieria picta (Meigen) was swept from saltmarsh vegetation at two sites in 2000, Newtown (SZ 4390) and St. Helens Duver (SZ 6389). There is a previous record from Walter's Copse (SZ 4390) (2.vii.1980, P.J. Chandler). Falk (1991) stated that the Isle of Wight is one of the strongholds for this nationally scarce saltmarsh species.

References.

- Clemons, L. 1997. "A provisional Atlas of the Tephritidae (Diptera) of Britain and Ireland". Dipterists Forum.
- Falk, S.J. 1991. "A review of the scarce and threatened Diptera of Great Britain and Ireland". Research and Survey in Nature Conservation. 39, Peterborough. Nature Conservancy Council.
- Stubbs, A.E. and Drake, M. 2001. "British Soldierflies and their allies". British Entomological and Natural History Society.

Corrections and changes to the Diptera Checklist (7) - Editor

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

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

In the notes below where names of genera and species are given as in the Checklist, authorship is not stated here. No corrections have been notified since the previous issue. Changes are listed under families; names new to the British list are given in bold type.

The notes below refer to the loss of 5 names due to synonymy (indicated by *), one deletion and addition of 18 species, a net gain of 12 resulting in a new total of 6735 species.

Changes

Mycetophilidae. The following change is due to J. ŠEVČÍK and L. PAPP (2001). Bolitophilidae and Mycetophilidae (Diptera): genera and species new to Hungary. *Folia Entomologica Hungarica* **62**, 217-229, who considered that *excogitata* Dziedzicki, 1910 is a different species from that usually called by this name:

Synplasta gracilis (Winnertz, 1863 – *Rymosia*) = *excogitata*: Edwards, 1941, misident., = *macrura*: Edwards, 1925, misident.

Ceratopogonidae. A new synonymy was proposed by R. SZADZIEWSKI (2001). European *Atrichopogon* of the *pavidus* group (Diptera: Ceratopogonidae). *Polskie Pismo Entomologiczne* **70**, 347-358):

Atrichopogon (sensu stricto) *pavidus* (Winnertz, 1852) = *pollinivorus* Downes, 1955*

Chironomidae. The following changes result from a paper by R. CONTRERAS-LICHTENBERG (2001). Revision der westpaläarktischen Arten des Genus *Glyptotendipes* Kieffer, 1913 (Insecta: Diptera, Nematocera, Chironomidae), Teil 2: Sg. *Glyptotendipes* s.str. Kieffer, 1913 und Sg. *Trichotendipes* Heyn, 1993. *Annalen des Naturhistorischen Museums, Wien* **103B**, 417-451):

Glyptotendipes scirpi (Kieffer, 1915 – *Chironomus*) = *mancunianus* (Edwards, 1929)

Glyptotendipes viridis (Macquart, 1834) = *imbecillis** (Walker, 1856), new synonym

Platypetidae. The following two species are added in the present issue:

Microxania vrydaghi Collart, 1954

Paraplatypeza bicincta (Szilády, 1941 - *Clythia*)

Phoridae. The following species was added by R.H.L. DISNEY (2001). The scuttle flies (Diptera: Phoridae) of Buckingham Palace Garden. *Supplement to The London Naturalist* No. **80**, 245-258):

Megaselia marklandi Disney, 2001

The following species was added by R.H.L. DISNEY (2002). A new species of maritime scuttle fly (Dipt., Phoridae) from East Sussex, England. *Entomologist's monthly Magazine* **138**, 19-22): *Megaselia yatesi* Disney, 2001

Significant changes also result from M. BUCK and R.H.L. DISNEY (2001. Revision of the *Megaselia giraudii* and *M. densior* species complexes of Europe, including ecological notes. *Beiträge zur Entomologie* **51**, 73-154):

Megaselia citrinella Buck in Buck & Disney, 2001 New to Britain

Megaselia densior Schmitz, 1927 = *coulsoni* Disney, 1987* New synonym; some material previously attributed to *nigrescens* and *badia* is also *M. densior*.

Megaselia haraldlundii Disney, 1995 ++ New to Ireland (based on a misidentified paratype of *M. badia*); not yet recorded from Britain.

Megaselia immodensior Disney in Buck & Disney, 2001 New to Britain, previously confused with *M. densior*.

Megaselia labellaspinata Disney in Buck & Disney, 2001 = *septentrionalis* sensu Disney, 1986

Megaselia quadriseta (Schmitz, 1918 – *Aphiochaeta*) + = *phoenicura* (Schmitz, 1926 – *Aphiochaeta*) = *badia* Schmitz, 1938* = *hayleyensis* Disney, 1987*, new synonyms

Megaselia raruvesiculae Disney in Buck & Disney, 2001 New to Britain, previously confused with *M. densior*.

Megaselia trojani Disney in Disney & Durska, 1998 New to Britain.

Megaselia xanthophila Buck in Buck & Disney, 2001 New to Britain, previously confused with *M. badia*.

Delete *Megaselia septentrionalis*. The true *septentrionalis* is only known from Sweden and the German Alps. All other published records are misidentifications. Some specimens attributed to this species proved to be *M. quadriseta*, others to be *M. labellaspinata* while some pinned specimens will need slide mounting to confirm their identity (Henry Disney *pers. comm.*).

Syrphidae. R.A. JONES (2002. *Heringia senilis* Sack (Diptera: Syrphidae): a hoverfly new to Britain. *British Journal of Entomology and Natural History* **14** (2001), 185-194) added the following species:

Heringia (sensu stricto) *senilis* Sack, 1938

An overlooked earlier change has been drawn to my attention:

Xylota jakutorum Bagachanova, 1980 = *coeruleiventris*; authors including Stubbs & Falk, 1983, misident. (according to V. MUTIN and F. GILBERT 1999. Phylogeny of the genus *Xylota* Meigen, 1822 (Diptera, Syrphidae), with descriptions of new taxa. *Dipteron* **2**(3), 45-68). This change was indicated with only the comment that it was equivalent to *coeruleiventris* form B of Zetterstedt, 1843 and Great Britain was still listed in the distribution of *X. coeruleiventris*, apparently in error (Alan Stubbs *pers. comm.*). The removal of *coeruleiventris* from the British list will be confirmed in the next issue of *Volucella* (H. BARTSCH, T.R. NIELSEN and M.C.D. SPEIGHT (in press) Reappraisal of *Xylota coeruleiventris* Zetterstedt, 1838, with remarks on the distribution of this species and *X. jakutorum* Bagatshanova, 1980 in Europe).

A species, previously confused with *Microdon mutabilis*, was described by K. SCHÖNROGGE, B. BARR, J.C. WARDLAW, E. NAPPER, M.G. GARDNER, J. BREEN, G.W. ELMES and J.A. THOMAS (2002. When rare species become endangered: cryptic speciation in myrmecophilous hoverflies. *Biological Journal of the Linnean Society* **75**, 291-300) without designation of type specimens, so the name was invalid (ICZN Code Article 16.4) but it was subsequently validated by an Addendum in the same journal (2002. **76**, 315):

M. myrmicae Schönrogge, Barr, Wardlaw, Napper, Gardner, Breen, Elmes & Thomas, 2002

A revision has appeared of the genus *Eristalis* by H. HIPPA, T.R. NIELSEN and J. VAN STEENIS (2001. The West Palaearctic species of the genus *Eristalis* Latreille (Diptera: Syrphidae). *Norwegian Journal of Entomology* **48**, 289-327). This, like most European authors,

treats the generic name as feminine and cites ICZN Code Article 31.1.1 to justify this (although that article relates to species group names based on personal names and the authors must have intended 30.1.1, which states that the gender of a Latin word should follow that in standard Latin dictionaries). The British checklist treated it as masculine following ICZN Opinion 1747 (as indicated in Note 3 of the checklist), although the gender is correctly feminine on the basis of Article 30.1.1, but resolution of this by ICZN would be desirable. The subgeneric division into *Eristalis* sensu stricto and *Eoxeristalis* is also not accepted. The only other change affecting the British list relates to *E. horticola* for which the name *lineata* (Harris, 1776 – *Musca*), first proposed by Thompson and Pont (1994), is used. The reasons for not adopting *lineata* are stated in Note 13 of the checklist. An application to ICZN would be necessary to conserve the name *horticola* and any views on this or the generic gender should be addressed to the Editor.

Pipunculidae. Some generic changes result from J.H. SKEVINGTON and D.K. YEATES (2001. Phylogenetic classification of Eudorylini (Diptera: Pipunculidae). *Systematic Entomology* 26, 421-452), who have transferred some British species of *Eudorylus* to two other genera:

CLARAEOLA Aczél, 1940 for *halterata* (Meigen) and *melanostola* (Becker).

DASYDORYLAS Skevington & Yeates, 2001 for *horridus* (Becker).

A key to the British species of Eudorylini, which accepts these changes, was provided by D.M. ACKLAND (2002. Test keys to British Eudorylini (including figures of the male and female genitalia). *The Piercer A Pipunculidae Newsletter*, No. 3, 2-8 + 23 unnumbered pages of figures) (circulated with *Bulletin of the Dipterists Forum* No. 53, Spring 2002).

Odiinidae. *Olinia betulae* MacGowan and Rotheray, 2002 is added in the present issue.

Chloropidae. The following species was added by J.W. ISMAY and I. PERRY (2002. *Diplotoxa dalmatina* Strobl (Dipt., Chloropidae) new to Britain. *Entomologist's monthly Magazine* 138, 33-36):

Diplotoxa dalmatina Strobl, 1900

The replacement of *Chlorops rufescens* by the more widely used name *meigenii* Loew, 1866 (a junior primary homonym of *meigenii* Fallén, 1823, itself a synonym of *Cerodontha denticornis*, Agromyzidae) was proposed by E.P. NARTSHUK (2001. Case 3190. *Chlorops meigenii* Loew, 1866 (Insecta: Diptera): proposed conservation of the specific name. *Bulletin of Zoological Nomenclature* 58, 286-287). The name *meigenii* should be used pending an Opinion.

Chyromyidae. J.W. ISMAY and L. CLEMONS (2001. A third British species of *Aphantosoma* Becker (Dipt., Chyromyidae). *Entomologist's monthly Magazine* 137, 211-214) added the following species:

Aphantosoma melitensis Ebejer, 1993

Drosophilidae. The name of *Drosophila rufifrons* is conserved by Opinion 1969 (2001. *Bulletin of Zoological Nomenclature* 58, 72-73).

Tachinidae. The following are added in the present issue. The new genus belongs to the Tribe Blondeliini, so should follow *Oswaldia* in the checklist:

Carcelia bombylans Robineau-Desvoidy, 1830

PARACRASPEDOTHRIX Villeneuve, 1919 and its species *P. montivaga* Villeneuve, 1919

The usage of *Siphona geniculata* and *S. cristata* as applied in the checklist is conserved by Opinion 1975 (2001. *Bulletin of Zoological Nomenclature* 58, 154-155).

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