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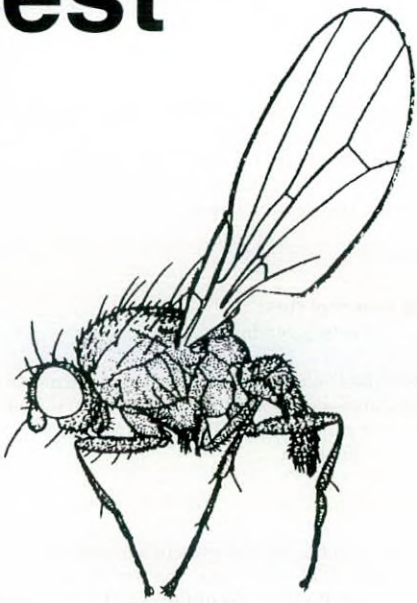
Cover illustration: *Microdon myrmicae* Schönrogge *et al.*, head-on view of female from Locks Park Farm, Devon (photograph by Rob Wolton, see article by him on pages 103-106).

Dipterists Digest



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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 European flies. All notes and papers submitted to **Dipterists Digest** are refereed.

The scope of **Dipterists Digest** is:

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

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Dipterists Digest 2012 **19,** 103-106

Observations on adult behaviour of *Microdon myrmicae* Schönrogge *et al.* (Diptera, Syrphidae), with particular reference to female survival, dispersal and oviposition

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Summary
40 adult male and 29 adult female *Microdon myrmicae* Schönrogge *et al.* were marked on a small site in Devon, England, with minimal disturbance. Adult females were re-seen much less often than adult males, and over much shorter time spans. In part this is because females are less easy to see. However, the extent of the difference between sexes suggests that other factors are at work as well. The hypothesis is put forward that where populations are dense as at the study site, many females may disperse away from their natal sites after just a day or two. A higher mortality rate among females than males cannot, though, be ruled out. Females were observed to move over distances of several metres while searching for ant nests in which to lay their eggs, and one movement of 25 metres was recorded between mating events. The length of these movements suggests that the very close host-parasite relationship found in the sibling species *M. mutabilis* (Linnaeus) does not occur in *M. myrmicae*, and is also consistent with ready dispersal. Two females were observed to mate twice, with different males on each occasion, showing that females as well as males can have multiple partners, although the possibility that the first mating was unsuccessful cannot be ruled out. Multiple partners reduces the genetic risks associated with the apparent lack of sexual selection during courtship. Two females were observed to insert their abdomens into ant nest entrances and on at least one of these occasions eggs were laid. Thus females do not necessarily need to enter right into ant nests to oviposit, as previously recorded. Eggs may be passively moved close to ant broods by gravity assisted by the movement of passing ants.

Introduction

This paper supplements Wolton (2011), which reported on 2009 and 2010 observations of *Microdon myrmicae* Schönrogge *et al.* In summer 2011 further observations were made of the *Microdon myrmicae* colony at the main study site, Locks Park Farm, Devon, England, in particular to improve understanding of adult female behaviour. The key questions addressed were how long the females live in the field, or at least remain within their natal site, and whether they mate with more than one male. In addition, further observations were made of their ant nest searching and egg laying behaviour.

Methods

Adults were seen between 11 May and 18 June 2011, about two weeks earlier than in the previous two years, possibly reflecting the unusually warm spring. In contrast during the adult emergence period in 2011 the weather was particularly wet and cold, with just three days of strong sunshine. On 10 days it was so heavily overcast and wet that no adult activity at all was noted.

Adults were marked with a dot of acrylic paint dorsally on the thorax, or occasionally wing base or side of the abdomen. A number of different conspicuous colours were used to facilitate individual identification. The marking was done without handling the flies at all – it was usually found possible, with a slow approach, to dab the insects with a fine pointed paint brush without them flying away, especially when cloudy. Many individuals did not move at all, showing no sign of disturbance. One male was observed to fly up and mate with a female

just 30 seconds after marking. Immediately after marking it was possible to photograph the majority of the marks to enable individual identification.

Results

A total of 40 males were marked, between 15 and 22 May. After this date, although many other males were seen, no attempt was made to mark them, effort being focussed on females. 29 females were marked between 18 May and 14 June (the first and last dates when adults of this sex were seen), the majority while mating. In all, 19 pairs were seen mating.

A minimum of 15 (37.5%) of the marked males were seen again at least once more after marking, four at least twice. However, only 3 (10.3%) of the females were re-seen, and all of these only once.

The longest interval between marking and final sighting for a male was 16 days. Another male was seen after 14 days, and two further ones after 13 days. For those males seen at least once after marking, the average number of days between marking and final sighting was 5.5. In contrast, the maximum such interval for a female was just four days, the other two re-sightings being the day after marking (average 2.0 days).

On 20 May a male marked five days previously was seen mating with two different females within an hour, while on 27 May a female marked while mating was re-found an hour later 25 metres away. being mated by another male. It is possible that marking disturbed the first mating attempt. On 2 June another female marked the day before was seen mating and then again an hour later with another male: she was not disturbed during either coupling, although it remains possible that the first mating was not concluded successfully.

Four females were closely observed while searching for ant nests. On the first occasion (2 June) the female covered a distance of about 6 metres, landing occasionally to rest or search, before finding a suitable nest. After walking around the nest for a minute she entered it and was lost to view. The nest was then gently opened. Two female *M. myrmicae* emerged! Three *Microdon* eggs were found about 3cm beneath the top of the nest (but no sign of any ant broods). On the second occasion (6 June) the female spent about 10 minutes exploring an area of about 1 square metre, making short flights before carrying out brief exploratory walks. She either did not find any ant nests, or none that were suitable, and then flew off at least 3 metres, where she was lost to sight.

The third female was observed for about 30 minutes (7 June). During this time she visited three tussocks within 1 metre of each other, at least two of which contained ant nests. Much of the time she spent motionless on or near the surface of the ant nests, occasionally flying or crawling a few centimetres, sometimes preening carefully with her forelegs, especially her face and antennae. At the third tussock she was observed wriggling her abdomen into the entrance hole of an ant nest, pausing in this position for about one minute. The tunnel below the hole, which was more or less vertical, was carefully opened down to a depth of 7cm but no eggs were seen. The fourth female (14 June) was watched for about an hour while she walked over the ground searching for ant nests, occasionally trying to fly but without success (it was a cold day). Most of her time was spent at two ant nests. At the first she appeared unable to find a suitable entrance point. However, at the second nest she was observed to wriggle her abdomen backwards and downwards. Here she paused for perhaps 30 seconds before moving on. The spot was then carefully examined and two eggs were seen at an entrance tunnel. The few ants moving around the surface of the nest ignored her, although she was heard to buzz briefly when one came close.

Discussion

Marked females were re-seen much less often than males (10.3% compared to 37.5%), and the period between marking and last sighting was much shorter (5 days compared to 16 days). This can be explained, in part at least, by females being much less conspicuous. Whereas males spend most of their time, unless it is raining, sitting in exposed positions waiting for females, in contrast females spend much time concealed in among the herbage, either resting or walking in search of ant nests in which to lay eggs. Although females do occasionally bask, this is often done in less exposed positions than those used by males. It seems improbable though, given the length of time spent searching for the females, that their inconspicuous behaviour accounts for all the difference in re-sighting rate and period. The other two possibilities are that females live less long, perhaps being more vulnerable to predators, or that they disperse away from the site more readily. No direct evidence was obtained to support either view. At the Locks Park Farm site no adults of either sex were ever seen to be taken by predators or found dead, although on a nearby site one individual was taken by a spider and another by an empid fly (*Empis livida* Linnaeus) (K. Miller and O. De Souza *pers. comm.*). Given the large number of ant larvae that need to be eaten by a single *M. myrmicae* larva before it reaches maturity (Schönrogge *et al.* 2006, supplementary appendix 2), where a population of *M. myrmicae* is high, as appears to be so at the Locks Park Farm study site, unless there is considerable female dispersal there must be a real risk that many ant broods will be eaten out if more than just a few *M. myrmicae* larvae are present, leading to starvation. It may be that females adopt a strategy of staying on their natal site for only a day or two, laying batches of eggs in just a few ant nests before dispersing in the hope of finding sites where there is less competition. Certainly, females are capable of surviving for many days, up to 20 under captive conditions (Wolton 2011). The longest interval between marking and last sighting for males at the Locks Park Farm site in 2011 (16 days, 1 individual) was similar to that noted in 2010 (18 days, 2 individuals) (Wolton 2011).

The recorded movement of a female between two points about 25 metres apart in an hour, and of another female covering a linear distance of about 6 metres while searching for egg laying sites, suggests that the very specific host–parasite relationship found by Elmes *et al.* (1999) for the sibling species *M. mutabilis* (Linnaeus) does not occur in *M. myrmicae*. *Microdon mutabilis* females are apparently reluctant to fly away from the nest from which they emerge, typically only flying vertically up for a metre or so to attract a mate (K. Schönrogge *pers. comm.*). The much more extensive movements recorded by female *M. myrmicae* are to be expected if they do indeed disperse readily.

The observation that females can mate with more than one male is in line with observations made for the Nearctic species *M. xanthopilis* Townsend and *Microdon fuscipennis* (Macquart) (Akre *et al.* 1973, Duffield 1981). As noted in Wolton (2011), no sexual selection is apparent during courtship, females being mated by the first male that seizes them. Having multiple partners reduces the risk to a female of being mated by just one low-quality male, and also presents the possibility of sperm competition.

In Wolton (2011) the question is asked as to how males recognise receptive females when these females are flying overhead. Since females searching for egg laying sites tend to fly low down among the herbage or even walk it may simply be that when they want to mate they just fly a little higher – otherwise they remain low down to avoid wasting time being mated unnecessarily. Observation of males suggests that they do not show much discrimination, frequently attempting to mate with other males and even other insects, some as large as bumble bees (*Bombus* species).

Wolton (2011) reported that females enter right into ant nests to lay their eggs, as suggested by them disappearing from view and finding eggs well within the nests. The observation reported here of finding two females within a nest when it was opened, after one of the females was seen to disappear into the tussock housing the nest, supports this. However, as recorded above it is also apparent that females can lay their eggs close to the surface of ant nests by inserting their abdomens into entrances. It may be that they adopt this approach when they are unable to locate tunnels big enough for them to enter completely. It may also be that eggs laid close to the surface are passively transported downwards nearer to ant brood chambers by a process of gravity assisted by the passage of ants.

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Trixoscelis marginella (Fallén) (Diptera, Trixoscelididae) in Surrey

- I swept dozens of the handsome little fly *Trixoscelis marginella* (Fallén, 1823) on open short acid grassland on Hankley Common golf course (SU8741), Surrey on 26 June 2012, and again at the same site and a singleton on the edge of an adjacent fairway, some 100 metres to the east, on 5 July 2012. The flies were seen on stems of *Rumex acetosella* and *Filago minima* amongst short *Festuca rubra* dominated grass used as a practice green. These appear be the first records from Surrey and southern heathland, but the structure and dry free draining substrate at the site are in keeping with previous habitat information (sandy areas of heaths such as in Breckland) and was similar to conditions where I took it at Cranwich Camp (TL7794), Norfolk on 14 July 2011 – **JONTY DENTON,** 31 Thorn Lane, Four Marks, Hants, GU34 5BX

Dipterists Digest 2012 **19,** 107-124

Puparial morphology and development sites of *Neottiophilum praeustum, Allopiophila vulgaris, Mycetaulus bipunctatus* and *Prochyliza varipes* (Diptera, Piophilidae)

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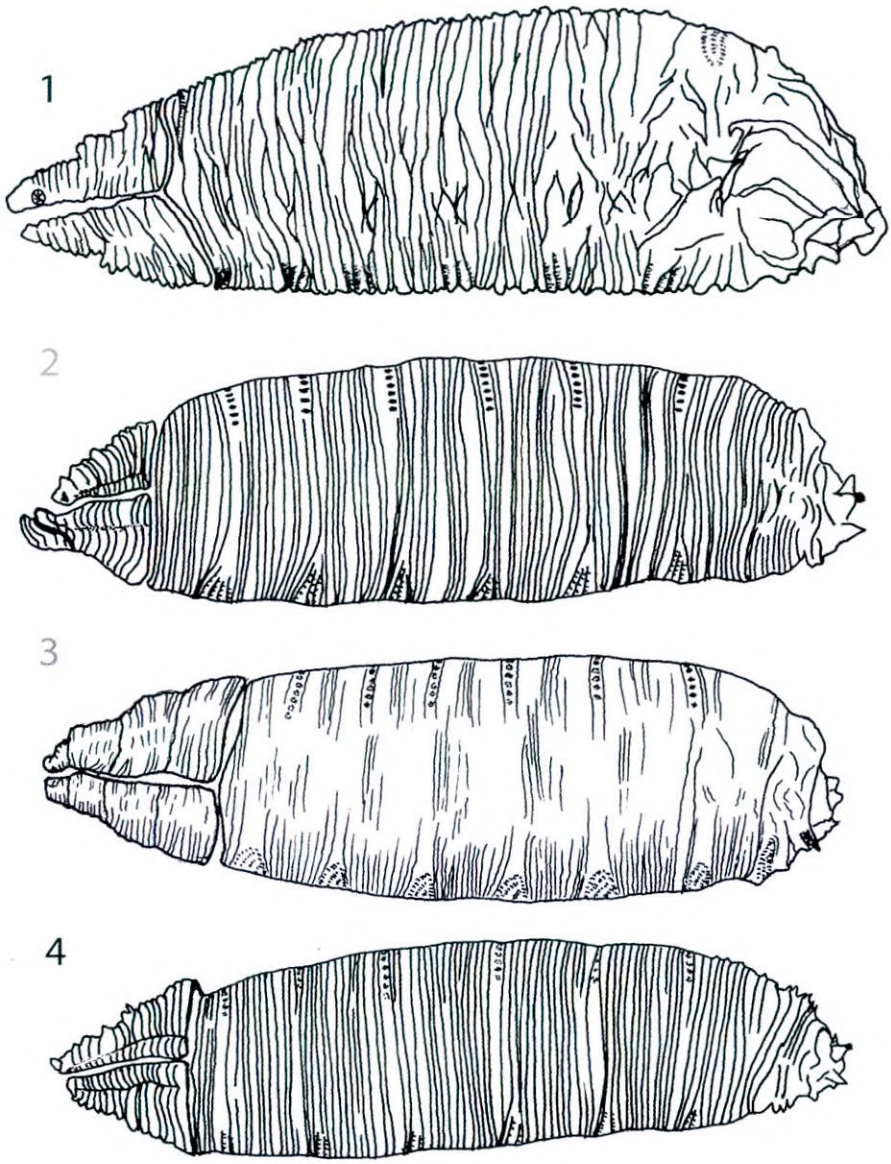
Summary
The puparia of *Allopiophila vulgaris* (Fallén), *Mycetaulus bipunctatus* (Fallén) and *Prochyliza varipes* (Meigen) (Piophilidae, Piophilinae) are described and compared with that of the bird brood ectoparasite, *Neottiophilum praeustum* (Meigen) (Piophilidae, Neottiophilinae). *Prochyliza varipes* was reared from the skull of a beached whale in Scotland. *Allopiophila vulgaris* was reared from a seabird nest on the island of St. Kilda, Scotland and this species and also *M. bipunctatus* and *N. praeustum* from the nests of various birds in southern England. The puparia of these four species are similar in shape and appearance and in the form of the posterior spiracles and arrangement of two pairs of projections bearing sensilla, one pair above and one below the posterior spiracles. The puparia differ in the form of these projections, the size and shape of the anterior spiracles and the number and arrangement of locomotory spicules. The head skeletons of *A. vulgaris, M. bipunctatus,* and *P. varipes* are similar and appear to have relatively weak pumps adapted for sucking in food of low resistance. In contrast, the head skeleton of *N. praeustum* has a more powerful pump, sharper and proportionally longer mandibles and is probably adapted, by fusion of parts, to withstand high compression forces as presumably are involved in piercing bird skin and sucking blood. The head skeletons of all four species share the unusual characters of lacking dental sclerites and having ventral pharyngeal or cibarial ridges reduced or absent.

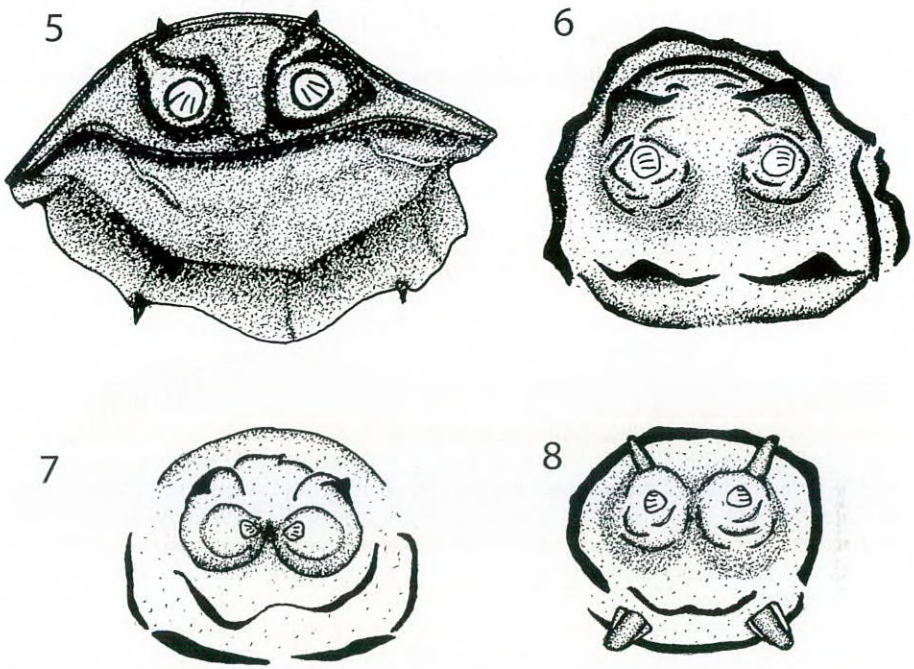
Introduction

Conflicting proposals have been made concerning the composition of the small, mainly Holarctic, acalypterate family Piophilidae (Diptera), in particular, whether or not the Neottiophilidae and the Thyreophoridae should be included and the status of subgenera within *Piophila* Fallén (McAlpine 1977, Zuska 1984, Ozerov 2000, Ozerov 2004). Following the concept of the family in Ozerov (2000), in which thyreophorines are accorded tribal status within Piophilinae, the British fauna consists of two subfamilies, Neottiophilinae, one common species of which is the bird brood ectoparasite, *Neottiophilum praeustum* (Meigen) and Piophilinae which includes the well known cheese-skipper, *Piophila casei* (Linnaeus). Adult neottiophilines are medium to large, shining, orange-brown flies; in contrast, piophilines are smaller and shining black or black and orange (Stubbs and Chandler 2001).

The development sites of philophids are often associated with birds and mammals, especially carrion, but also fungi (McAlpine 1977) and a range of other development sites are reported such as dead snails, dead leaves, dung, pine cones and decaying wood (Ferrar 1987). Available larval descriptions vary in detail and include those for *Piophila casei* (Hennig 1943, Bohart and Gressitt 1951, Ferrar 1987, Sukontason *et al.* 2001), *N. praeustum* (Keilin 1924, Tate 1954, Draber-Monko 2006), *Mycetaulus bipunctatus* (Fallén), *Allopiophila vulgaris* (Fallén) and *Stearibia nigriceps* Meigen (Hennig 1943), *Centrophlebomyia furcata* (Fabricius) (Freidberg 1981) and *Piophila megastigmata* McAlpine, 1978 (Ebejer 2012). Brindle (1965) provided a key to the larval stages of four British piophilines: *M. bipunctatus, P. casei, Prochyliza varipes* (Meigen) and *A. vulgaris,* with comparative descriptions and drawings of key characters and, based on this key, Smith (1986) added *C. furcata.*



Figs 1-4. Piophilidae, whole puparia, lateral view, anterior end to the left. 1, *Neottiophilum praeustum*, length 8mm; 2, *Allopiophila vulgaris*, length 3.8mm; 3, *Mycetaulus bipunctatus*, length 3mm; 4, *Prochyliza varipes*, length 3.8mm.



Figs 5-8. Piophilidae, puparia, apical view of anal segment. 5, *Neottiophilum praeustum*; 6, *Allopiophila vulgaris*; 7, *Mycetaulus bipunctatus*; 8, *Prochyliza varipes*.

In this paper we describe the little studied puparia and especially the larval head skeletons of *A. vulgaris, M. bipunctatus* and *P. varipes* and compare them with the puparium and head skeleton of *N. praeustum*. We also provide rearing records for all these species, many coming from bird nests obtained in the 1930s by the late E.B. Basden.

Methods

The puparia and records in this paper were extracted from material in the National Museums of Scotland, the Hunterian Museum, University of Glasgow and the Oxford University Museum of Natural History. Labels associated with pinned specimens provided key data but for material reared by E.B. Basden, more detailed information was extracted from associated datasheets. For example, for each piophilid species reared, Basden gives details such as, geographical locality, date, position, height and composition of development sites along with details of the specimens reared, their number, sex and emergence periods.

Identification was checked using the key to British Piophilidae by Stubbs and Chandler (2001). To describe puparia they were first cleaned by soaking in warm water or a solution of KOH and picking debris off with pins or a paintbrush. Head skeletons were examined by detaching the anteroventral plate of the puparium (containing the head skeleton), which is loosened by the emergence of the adult fly, soaking it in a solution of hot KOH for

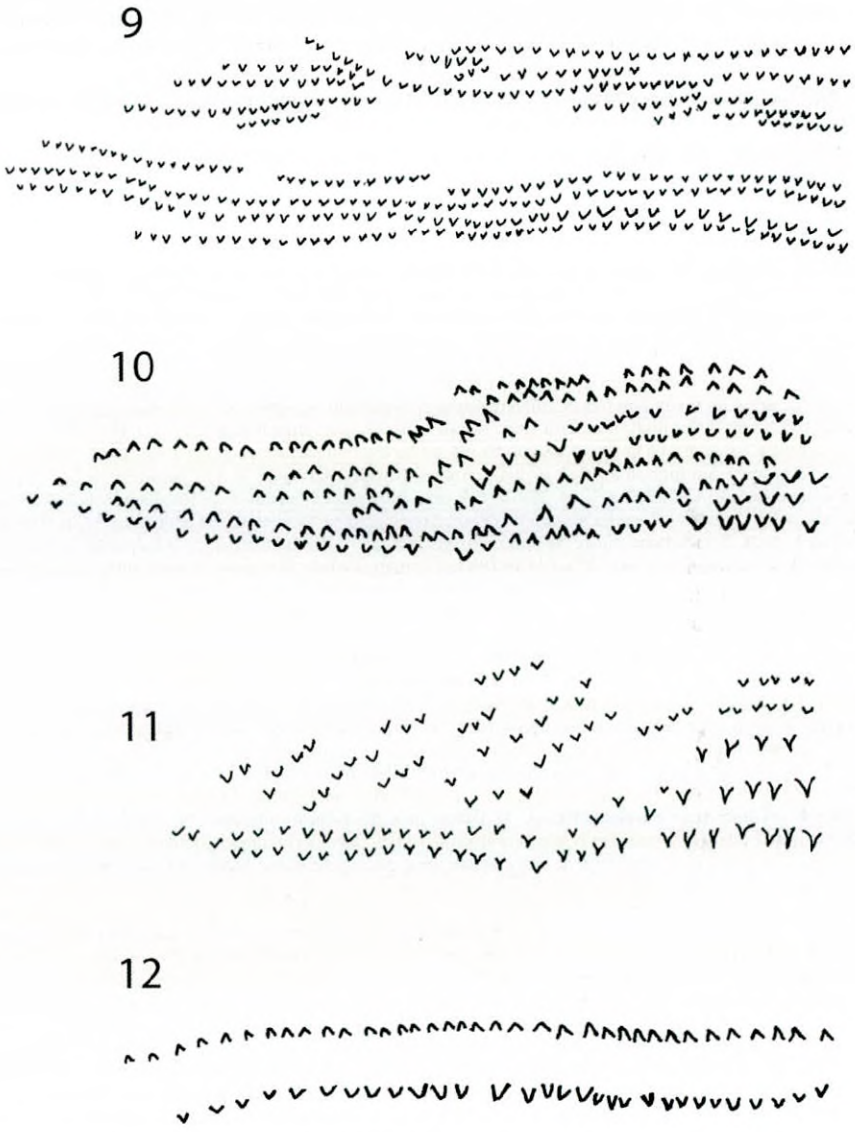
about 10 minutes and removing the head skeleton with pins. To prevent desclerotisation, head skeletons were then placed in glacial acetic acid for about 10 minutes. Puparia and head skeletons were examined using stereo and compound microscopy. The size of a structure was the mid-dorsal length taken with a measuring eyepiece. To compare head skeletons, variation in size was corrected by measuring sclerite lengths and expressing them as proportions of the length of the second abdominal segment of the puparium from which the head skeleton had been extracted. Illustrations were made using a drawing tube attached to the stereo microscope or traced from printed images obtained from a camera attached to the compound microscope; drawings overcame problems of distortion and poor image quality. On first mention of a bird or plant species, the Latin binominal is given and thereafter, the English name. Piophilid species are presented in checklist order (Chandler 1998, updated at dipteristsforum.org.uk). Following examination, puparia were stored in gelatin capsules and head skeletons in genitalia tubes in a drop of glycerol. Terminology for head skeletons follows Courtney *et al.* (2000) and Rotheray and Gilbert (2008).

Results

Neottiophilinae

Neottiophilum praeustum: description of puparium

Length 8-10mm, width 3-4mm, length of second abdominal segment 0.9mm, n = 6; red-brown in ground colour; shape somewhat variable but usually 'pip-shaped' (Draber-Monko 2006), i.e. tapering anteriorly, truncate posteriorly and with dorsoventrally flattened lateral margins (Fig. 1); thorax and abdomen circumvented by transverse and anastomosing striae that form an obscure but regular segmental pattern; segment boundaries also indicated by the pattern of spicules: ventrally forming a broad (coating the anterior half of a segment) tapering group on thoracic segments and on each abdominal segment 1-7 and dorsally forming a narrow band (<0.25 segment width) on thorax and abdominal segments 1-5 and broadening on segments 6-7 to occupy up to half the anterior section; segment boundaries also indicated by pairs of large flanges on the lower antero-lateral margins of thoracic and abdominal segments 1-7, each flange with two sensilla; linear sequences of small depressions on segment boundaries apparently absent; locomotory spicules mostly uniform in size and arranged in two groups of 4-6 mostly linear sequences (Fig. 9); anterior spiracles with about 15 respiratory bulbs in a horseshoe shape and flattened against the integument (Fig. 14); posterior spiracles with a pair of tapered projections bearing sensilla above and a pair below (Fig. 5); dome-shaped projections bearing posterior spiracular plate short, shorter than basally wide, in apical view, spiracular plates separated by about 3x their width; spiracular plate (Fig. 13) with spiracular openings arranged radially and about 3x as long as maximum width; spiracular plate inclined upwards with an ovoid and tapering ecdysial scar on the upper, inner margin; 4 projections on either side of the spiracular openings (setae missing in the specimens examined); head skeleton (Figs 21 and 25): length 1.2mm, mandible length 0.2mm, n = 1; mandible with an oval-shaped window in the rectangular-shaped base; mandible not fully sclerotised; apex of hook aligned with the lower margin of the rectangular base (Fig. 21); intermediate sclerite block-shaped in profile view, with ventral bridge towards posterior end, sclerotised and fused with the basal sclerite, with the area of fusion apparently indicated by the degree of sclerotisation (Fig. 21); intermediate sclerite also fused with all but the apex of the parastomal bar and the region of fusion apparently also indicated by the degree of sclerotisation (Fig. 21); basal sclerite without sclerotised dorsal bridge and cibarial ridges; dorsal cornu slightly shorter but wider than the ventral cornu, cornua approximately parallel;



Figs 9-12. Piophilidae, puparia, locomotory spicules on the right hand side of the third abdominal segment, anterior end uppermost, mid-ventral line on the right. 9, *Neottiophilum praeustum*; 10, *Allopiophila vulgaris*; 11, *Mycetaulus bipunctatus*; 12, *Prochyliza varipes*.

vertical plate, dorsal cornu and upper part of the ventral cornu lightly sclerotised; in profile view ventral bridge and labial sclerites appearing below the intermediate sclerite; in ventral view these sclerites U-shaped (Fig. 25); labial plate inconspicuous.

Material examined: 1 head skeleton extracted from a puparium of a group of 6, Scotland, **Midlothian:** Penicuik, ex old nest of a blackbird, *Turdus merula* (Linnaeus), 1951, E.C. Pelham-Clinton.

Additional records: all from bird nests collected mostly in England by E.B. Basden, in approximate order of nest collection dates within each county: **Berkshire:** Farnham Royal, 15 puparia in linnet, *Carduelis cannabina* (Linnaeus), nest collected 20.vi.1930, 4 adults em. 18-22.iv.1931, nest 1.3m high in a privet *Ligustrum vulgare* hedge; Farnham Royal, 6 larvae in song thrush, *Turdus philomelos* Brehm, nest collected 20.viii.1930, 2 adults em. 18.iv and 6.v.1931; Farnham Royal, 65 larvae in chaffinch, *Fringilla coelebs* Linnaeus, nest collected 11.vi.1931, 7 adults em. 9.vi-5.v.1932, nest 2.8m in a holly, *Ilex aquifolium*; Farnham Royal, 3 puparia in whitethroat, *Sylvia communis* Latham, nest collected 28.vi.1932, 3 adults em. 23.vi.1932, nest 1.2m high in an elm *Ulmus* species; Farnham Royal, 9 larvae and puparia in greenfinch, *Carduelis chloris* (Linnaeus), nest collected 24.vi.1931, 2 adults em. 26 and 30.iv.1932; Farnham Royal, 25 puparia in bullfinch, *Pyrrhula pyrrhula* (Linnaeus), nest collected 24.vii.1931, 24 adults em. 16.iv-3.v.1932, nest 2.2m high in ivy, *Hedera helix*, growing up an elm tree; Farnham Royal, 5 puparia in bullfinch nest collected 16.vii.1931, 1 adult em. 19.iv.1932, nest 1.8m high in an elm tree; Temple, from a song thrush nest collected 12.xii.1931, 1♂ em. 7.iv.1932, nest 1.2m high in a hedge; Farnham Royal, 41 larvae in linnet nest collected 6.vi.1932, 13♂, 18♀ em. 8.iv-6.v.1933, nest 1.5m high in a privet hedge; Farnham Royal, 3 larvae in nest of blackcap, *Sylvia atricapilla* (Linnaeus), collected 14.vi.1932, 1♂ em. 30.iii.1933, nest 1.8m high in an elm tree; Farnham Royal, 202+ larvae in nest of a hedge sparrow, *Prunella modularis* (Linnaeus), collected 15.vi.1932, 62 adults em. 31.iii-20.iv.1933, nest 1.8m high in a snowberry bush, *Symphoricarpos rivularis*; Farnham Royal, 10 larvae in bullfinch nest collected 20.vi.1932, 5♂, 4♀ em. 27.iii-11.iv.1933; Farnham Royal, 38 larvae in song thrush nest collected 22.vi.1932, 20 adults em. 25.iii-16.iv.1933, nest 1.8m high in a holly; Temple, 39 larvae in nest of carrion crow, *Corvus corone* Linnaeus, collected 24.vi.1932, 33 adults em. 31.iii-29.iv.1933, nest 12.1m high in a Scot's pine tree, *Pinus sylvestris*; Farnham Royal, 70+ larvae in bullfinch nest collected 24.vii.1932, 29 adults em. 2-18.iv.1933, nest 2.1m high in a poplar tree, *Populus* species; Farnham Royal, 1 puparium in nest of greenfinch collected 17.vi.1931, no adult em., nest 3.3m high in a hawthorn tree; Temple, from greenfinch nest collected 5.xi.1932, 1♂, 2♀ em. 12.iv.1933, nest 1.5m high in an elm hedge; Farnham Royal, 5 puparia in nest of red-backed shrike, *Lanius collurio* Linnaeus, collected 4.vii.1931, no adults em., nest 2.7m high in a hawthorn tree; Temple, 1 puparium in nest of greenfinch collected 12.xii.1931, no adult em., nest 2.2m high in an elm; Farnham Royal, 20 adults em. 15-29.iv.1933 from a hedge sparrow nest collected 18.iii.1933, nest 0.7m high in a hedge; Farnham Royal, Common, 21 adults em. 17.iv-3.v.1933 from a blackbird nest collected 12.iv.1933, nest 5.4m high in a Scots pine tree; Farnham Royal, 31 larvae in a linnet nest collected 29.v.1933, 4♂, 11♀ em. 4-19.v.1934, nest 1.6m high in a privet hedge; Farnham Royal, 2 larvae in an unidentified nest collected 7.vi.1933, 1 adult em. 12.v.1934, nest 3.3m high in a bay willow tree, *Salix pentandra*; Farnham Royal, 161 puparia and 2 dead larvae in a blackbird nest collected 28.x.1933, 25 adults em. 3-12.v.1934, nest 3.6m high in an elm tree; Farnham Royal, 25 empty puparia in a song thrush nest collected 28.x.1933, nest 0.9m high in a hawthorn; Farnham Royal, 2 adults em. 5.iv.1933 from a greenfinch nest collected 14.i.1933, nest 2.4m high in a tree; Farnham Royal, 70 larvae in a chaffinch nest collected 7.vi.1933, no adult emergence recorded, nest 2.5m high in a bay tree; Farnham Royal, 52 larvae in a chaffinch nest collected 8.vi.1933, 6♂, 8♀ em. 27.iv-12.v.1934, nest 1.6m high in a rose bush; Farnham Royal, 70 larvae in a song thrush nest collected 10.vi.1933, 20♂, 11♀ em. 22.vi-21.v.1934, nest 1.6m high in a box bush, *Buxus sempervirens*; Farnham Royal, 38 larvae in a wren, *Troglodytes troglodytes* (Linnaeus), nest collected 13.vi.1933, 4♂, 5♀ em. 14.iv-7.v.1934, nest 1.8m high in a hawthorn hedge; Farnham Royal, 10 larvae in a linnet nest collected 12.vii.1933, 9♂ em. 14-17.iv.1934, nest 2.5m high in an apple tree, *Malus* species; Farnham Royal, 26 small puparia in a blackbird nest collected 20.i.1934, 10♂, 23♀ em. 12.iv-7.v.1934, nest 4.2m high in a pear tree, *Pyrus communis*; Farnham Royal, 15 larvae in a hedge sparrow nest collected 1.vi.1934, no adult emergence recorded, nest 5.4m high in a poplar tree; Farnham Royal, 52 larvae in a linnet nest collected 6.vi.1934, 5♂, 11♀ em., no dates recorded, nest 1.3m high in a privet hedge; Farnham Royal, 10 larvae in a linnet nest collected 6.vi.1934, 4♂, 3♀ em., no dates recorded, nest 1.3m high in a privet hedge; Farnham Royal, 44 larvae in a chaffinch nest collected 28.vi.1934, 2♂ em. 1.v.1935, nest 0.9m high in a hawthorn hedge; **Buckinghamshire:** Burnham Beeches, 92 larvae in chaffinch nest collected 10.vi.1931, 23 adults em. 9.iv-26.iv.1932; East Burnham Common, 1 puparium in linnet nest collected 16.vi.1931, adult em. 10.vi.1932, nest 0.3m high in gorse *Ulex europaeus*; East Burnham, 14 puparia and 1 dead

larva in chaffinch nest collected 25.vi.1931, 6 adults em. 23-30.iv.1932, nest 1.2m high in a hawthorn hedge, *Crataegus monogyna*; Burnham Beeches, 46 larvae in chaffinch nest collected 9.vi.1932, 6♂, 10♀ em. 3-12.iv.1933, nest 1.2m high in a gorse bush; Bourne End, 54 larvae in an unidentified nest collected 26.vi.1932, 23 adults em. 25.iii-8.iv.1933, nest 0.4m high in a rose bush, *Rosa* species; Burnham Beeches, 2 larvae in a blackcap nest collected 9.vii.1932, 1♂ em. 30.iii.1933; Boveney, 22+ puparia in nest of blackbird collected 12.xi.1932, 11♂, 15♀ em. 27.iii-17.iv.1933, nest 1.3m high in a hawthorn; East Burnham, from nest of a blackbird collected 14.i.1933 6 adults em. 27.iii-14.iv.1933, nest 1.3m high in a hedge; near Amersham, 1♂ em. 19.iv.1933 from a bullfinch nest collected 26.xi.1932, nest 1.8m high in a hawthorn; Boveney, 2♂ em. 7 and 11.v.1934 from a blackbird nest collected 16.xii.1933, nest 0.7m high in a bird cherry tree, *Prunus* species; Boveney, 13 puparia in a song thrush nest collected 16.xii.1933, 5♂, 7♀ em. 8.iv-14.v.1934, nest 0.6m high in a hawthorn hedge; **Sussex:** Seaford, 30-40 larvae in a carrion crow nest collected 24.vi.1934, 9♂, 11♀ em. 4-31.v.1935, nest 1.9m high in a blackthorn, *Prunus spinosa*; Seaford, 16♂, 34♀ em. 26.iv-11.v.1935 from a carrion crow nest collected 22.vii.1934, nest 1.4-1.6m high in a blackthorn; **Hampshire:** Bransgore, 22 larvae in wren nest collected 14.vi.1933, 10♂, 4♀ em. 20.iv-7.v.1934, nest 0.9m high in a gorse bush; Bournemouth, 58 larvae in hedge sparrow nest with cuckoo, *Cuculus canorus* Linnaeus, collected 22.vi.1934, 16♂, 15♀ em., no dates recorded, nest 2.4-2.7m high in a rose bush; **Surrey:** Cobham, 17 empty puparia in a hedge sparrow nest collected 14.vii.1934, nest 1.5m high in a privet hedge; Scotland, **Midlothian:** Bonnyrigg, 14 empty puparia in an unidentified nest collected 5.i.1950, nest 0.7m high in a privet hedge.

Piophilinae

Allopiophila vulgaris: description of puparium

Length 3.8-4mm, width 1-1.2mm, length of second abdominal segment 0.3-0.4mm, n = 4; brown in ground colour; circumvented by nearly complete and incomplete transverse striae forming a fairly regular pattern between segments (Fig. 2); segment boundaries indistinct and indicated by the position of linear sequences of small depressions on the dorsum of the abdomen, locomotory spicules and gaps between striae (Fig. 2); lateral and dorsal margins of all segments except the prothorax without spicules; locomotory spicules on abdominal segments 1-7 forming a complex pattern of 7-8 interrupted rows, rows widest mid-ventrally and tapering towards lateral margins, largest spicules in the middle of the posterior 2-3 rows (Fig. 10); anterior spiracles double fan-shaped with 7-8 respiratory bulbs on each side (Fig. 16); posterior spiracles with a pair of tapered projections bearing sensilla above and a pair below (Fig. 16); dome-shaped projections bearing posterior spiracular plate short, shorter than basally wide, in apical view, spiracular plates separated by about 4x the width of a spiracular plate; spiracular plate (Fig. 15), with a slightly raised and indented rim at the distal ends of the 3 spiracular openings; spiracular openings arranged radially, inclined and about as long as the widest diameter of the oval-shaped ecdysial scar; spiracular plate inclined towards mid-line with ecdysial scar on the mid inner margin; 4 projections on either side of the spiracular openings, apparently lacking setae; head skeleton (Figs 22, 27), length about 0.5mm; mandible, length 0.1mm, not fully sclerotised, with an oval-shaped window in the rectangular-shaped base; apex of hook above the lower margin of rectangular base; intermediate sclerite club-shaped with ventral bridge towards posterior end, sclerotised and separate from the basal sclerite and the parastomal bar (Fig. 22); parastomal bar with sclerotised margin in lateral view (Fig. 22); basal sclerite lacking cibarial ridges but sclerotised dorsal bridge present; sclerotised apex of dorsal cornu with a linear strip lacking sclerotisation; dorsal cornu, length 0.36mm, slightly shorter than the ventral cornu and cornua diverging slightly; vertical plate narrowed and sclerotised across middle; labial sclerites tapering towards each other from the ventral bridge; divided labial plate just posterior to the labial sclerites and not as heavily sclerotised (Fig. 27).

Material examined: England, **Berkshire:** Temple, 1 puparium and associated ♂, ex nest of rook, *Corvus frugilegus* Linnaeus, nest about 17m high in a pine tree, nest collected 30.v.1931, adult em. 18.vi.1931, E.B.

Basden; Scotland, **St Kilda, Hirta:** 3 puparia and associated adults, 2♀, 1♂, from seabird nest in quarry, collected 1-8.vii.2006, adults em. 11.viii.2006, E.G. Hancock and J. Robinson.

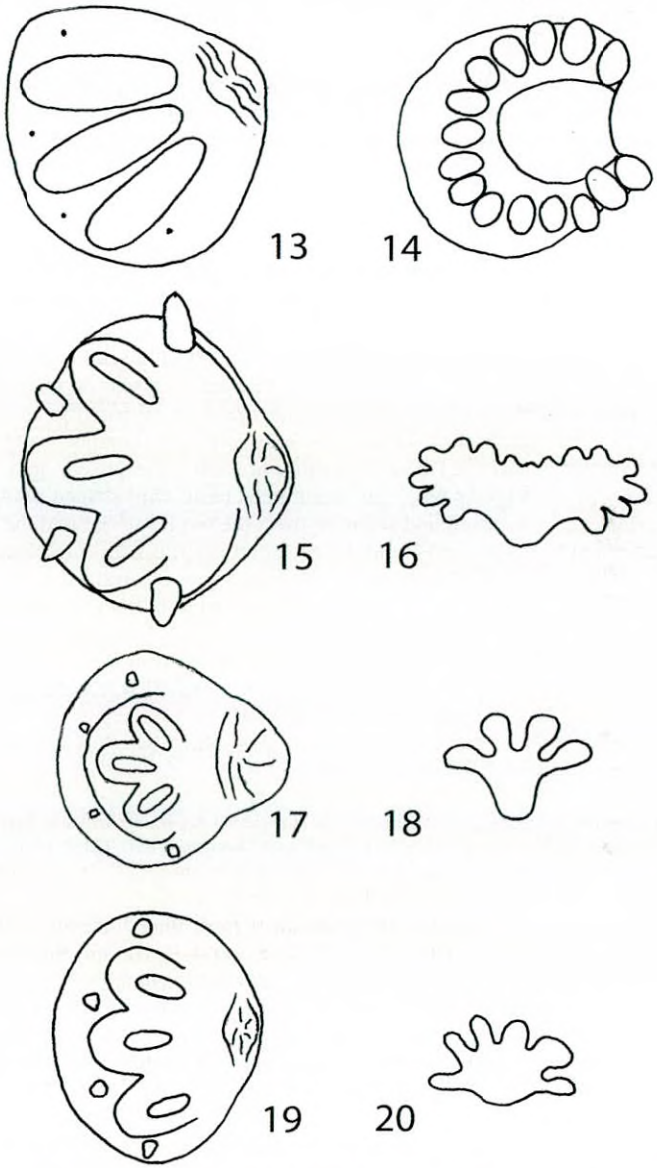
Additional records: all from bird nests in England collected by E.B. Basden, in order of nest collection dates: **Buckinghamshire:** Burnham Beeches, 1♂ ex chaffinch nest 1.2m high in a gorse bush, nest collected 9.vi.1932, adult em. 12.iv.1933; Beaconsfield, 13♂, 15♀ ex greenfinch nest 2.4m high in a hawthorn, nest collected 26.xi.1932, adults em. 28.iii-16.vi.1933; East Burnham, 1♂, 1♀ ex blackbird nest 1.3m high in a hawthorn, nest collected 14.1.1933, adults em. 14.vi.1933; Boveney, 2 adults ex blackbird nest, 0.7m high in a *Prunus* hedge, nest collected 16.x.1933, adults em. 18 and 21.v.1934.

***Mycetaulus bipunctatus*: description of puparium**

Length 3mm, width 1mm, length of second abdominal segment 0.3mm, n = 2; yellow-brown in ground colour; patchily circumvented by some, mostly incomplete, often faint, transverse striae (Fig. 3), forming an inconspicuous, regular, segmental pattern dorsally and laterally and more clearly ventrally; segment boundaries also indistinct and indicated by the position of striae and locomotory spicules (Fig. 3); except for prothorax, lateral and dorsal segment margins without spicules; locomotory spicules on abdominal segments 1-7 forming a wide band on the anterior half of each segment, spicules varying in size with largest spicules in two posterior rows mid-ventrally and short inclined bars of spicules on either side of the midline (Fig. 11); anterior spiracles fan-shaped with 4 respiratory bulbs (Fig. 18); posterior spiracles with a pair of sensilla-bearing, cylindrical projections above and a pair below (Fig. 7); dome-shaped projections bearing posterior spiracular plates short, shorter than basally wide, in apical view, spiracular plates separated by about 2x the width of a spiracular plate; spiracular plate (Fig. 17) with a slightly raised and indented rim at the distal ends of the 3 spiracle openings; spiracular openings arranged radially, parallel and short, about as long as diameter of the ecdysial scar; ecdysial scar tapered in shape; spiracular plate inclined inwards with ecdysial scar on the mid inner margin; 4 slight projections on either side of the spiracular openings, apparently lacking setae; head skeleton (Fig. 23), length about 0.4mm; mandible, length 0.08mm, with an oval-shaped window in the rectangular-shaped base; mandible not fully sclerotised; apex of hook relatively broad and ending above the lower margin of rectangular base; intermediate sclerite club-shaped with ventral bridge towards posterior end, sclerotised and separate from the basal sclerite and the parastomal bar (Fig. 23); parastomal bar completely sclerotised; basal sclerite with sclerotised dorsal bridge and apparently lacking ventral pharyngeal or cibarial ridges; sclerotised posterior apex of dorsal cornu with a linear strip lacking sclerotisation; dorsal cornu, length 0.3mm, slightly shorter than the ventral cornu and cornua approximately parallel; vertical plate narrowed and sclerotised across middle; labial sclerites tapering towards each other from the ventral bridge; divided labial plate just posterior to the labial sclerites and not as heavily sclerotised (Fig. 23).

Material examined: England, **Oxfordshire:** near Shotover, 2 reared adults plus puparia, ex old nest of a hedge sparrow, larvae collected 1.ii.1925, adults em. 21.v.1925 and 8.vi.1925; Headington, 1 reared adult plus puparium, ex old nest of a greenfinch, larva collected 20.ii.1928, adult em. 1.vi.1928, all from the A.H. Hamm collection, Oxford University Museum of Natural History.

Additional records: England, **Buckinghamshire:** Marlow, 13 reared adults, ex nest of a greenfinch nest 1.8m high in a hawthorn hedge, nest collected 29.x.1932, adults em. 7.vi-10.vii.1933, E.B. Basden.



Figs 13-20. Piophilidae, puparia, left column: apical view of left hand posterior spiracular plate, ecdysial scar to the right; right column: anterior spiracles. 13, 14, *Neottiophilum praeustum*; 15, 16, *Allopiophila vulgaris*; 17, 18, *Mycetaulus bipunctatus*; 19, 20, *Prochyliza varipes*.

Prochyliza varipes

Description of puparium

Length 3.8mm, width 1mm, length of second abdominal segment 0.4mm, n = 1; yellow-brown in ground colour; circumvented by nearly complete and incomplete transverse striae forming a fairly regular pattern between segments; segment boundaries indistinct and indicated by the position of locomotory spicules and gaps between striae (Fig. 4); lateral and dorsal margins of all segments except the prothorax without spicules; locomotory spicules on abdominal segments 1-7 forming a pair of parallel rows (Fig. 4); anterior spiracles fan-shaped with 6 respiratory bulbs (Fig. 20); posterior spiracles with a pair of sensilla-bearing, cylindrical projections above and a pair below (Fig. 8); dome-shaped projections bearing posterior spiracular plates short, shorter than basally wide, in apical view, spiracular plates separated by about 3x the width of a spiracular plate; spiracular plate (Fig. 19) with a slightly raised and indented rim at the distal ends of the 3 spiracle openings; spiracular openings arranged radially, parallel and just shorter than the diameter of the ecdysial scar; ecdysial scar tapered in shape; spiracular plate inclined inwards with ecdysial scar on the mid inner margin; 4 slight projections on either side of the spiracular openings, apparently lacking setae; head skeleton (Figs 24, 26), length about 0.3mm; mandible, length 0.08mm, with an oval-shaped window in the rectangular-shaped base; mandible not fully sclerotised; apex of hook above the lower margin of rectangular base; intermediate sclerite club-shaped with ventral bridge towards posterior end, sclerotised and separate from the basal sclerite and the parastomal bar (Fig. 24); parastomal bar completely sclerotised; basal sclerite with sclerotised dorsal bridge and apparently lacking ventral pharyngeal or cibarial ridges; sclerotised apex of dorsal cornu with a linear strip lacking sclerotisation; dorsal cornu, length 0.2mm, slightly shorter than the ventral cornu and cornua approximately parallel; vertical plate narrowed and sclerotised across middle; labial sclerites tapering towards each other from the ventral bridge; divided labial plate just posterior to the labial sclerites and not as heavily sclerotised (Fig. 26).

Material examined: Scotland, **East Lothian:** North Berwick, 1964, 1 puparium with associated ♂, ex larva found in a beached cetacean skull, E.C. Pelham-Clinton.

Additional records: 1♂, same data as above record but without puparium; Scotland, **Inverness-shire:** Glen Morriston, 26.vi. 1955, 1♂ found on dead buzzard, *Buteo buteo* (Linnaeus), E.C. Pelham-Clinton.

Discussion

Zuska and Laštovka (1965) recorded *M. bipunctatus* from fungi. Hennig (1943) recorded it from decaying wood and Scott (1907), E.B. Basden and A.H. Hamm (this study) recorded it from bird nests. Basden reared 15 specimens but only from a single nest, that of a chaffinch, while Hamm reared it from a blackbird nest. Colyer and Hammond (1968) recorded larvae of *P. varipes* from discarded chicken legs outside the den of a fox. Smith (1975) recorded adults on a dead fox and Brindle (1965) obtained it from fish heads while Ferrar (1987) referred to a possible record from bones of a dead whale in Iceland. In this study, E.C. Pelham-Clinton reared it from a cetacean skull and adults were found on a dead buzzard. *Prochyliza varipes* was not reared by E.B. Basden and given the scale of his investigation into bird nest Diptera (Rotheray 1989), it seems that it and *M. bipunctatus* only use bird nests for development infrequently.

Similarly, *A. vulgaris* appears to have a wide range of development sites. It has been reared from dead foxes (Brindle 1965, Smith 1984), dead snails (Beaver 1972), dung (Skidmore 1978) and bird nests (Basden, this study). Basden reared 35 specimens from 5

nests of 4 bird species. Nests varied in height from 0.7 to over 5m above ground, but 29 came from one nest, that of a greenfinch. In the datasheets, Basden refers to the presence in nests of bones, feathers, unhatched eggs, egg shells and in one blackbird nest, the remains of a dead bird. He also refers to mice that had occasionally taken over nests. It appears that carrion of one kind or another was present in the nests sufficient to enable piophiline larvae to develop. The records of Hennig (1943) from decaying wood and leaves are possibly explained by larvae that had developed on nearby carrion or fungi etc., and had moved into wood and leaves to pupariate.

In contrast, with an ectoparasitic way of life, *N. praeustum* is confined to bird nests for development. Over a four year period, 1930-1934, Basden recorded 1,314 specimens from 55 nests of 12 bird species with 58% coming from nests of the hedge sparrow and the chaffinch. Relative to the host lists in Keilin (1924), Tate (1954), Owen (1957) and Draber-Monko (2006) new bird hosts obtained by Basden are the bullfinch, cuckoo, red backed strike and the whitethroat. A mean of 23.9 specimens, range 1-202, were present in nests and nests varied in height from 0.3 to 5.4 metres above ground. Unusually, Basden recorded the numbers of larvae and puparia found in nests at the time of collection and the number of adults that subsequently emerged. Comparing these figures enables an estimate of survivorship: 990 were noted of which 63.5% or 627 produced adults and from those that were sexed, an almost equal sex ratio occurred of 246 males to 249 females. Whether these figures mirror those of natural populations is unclear.

The form of the puparium in the four piophilid species studied here is similar. They have numerous striae circumventing the thorax and the abdomen (Figs 1-4), anal segment with sensilla borne on projections (Figs 5-8), spiracular plates with 3 parallel to radiating spiracular slits on the outer margin and an ovoid, ecdysial scar on the inner margin (Figs 13, 15, 17 and 19). Previous descriptions of piophilid early stages do not assess all these characters but they may, nonetheless, distinguish the Piophilidae relative to the other families of the Tephritoidea to which McAlpine (1989) referred the family and which position is supported by Wiegmann *et al.* (2011). The puparia of the four species are readily separated by their anterior spiracles, projections of the anal segment and the locomotory spicules:

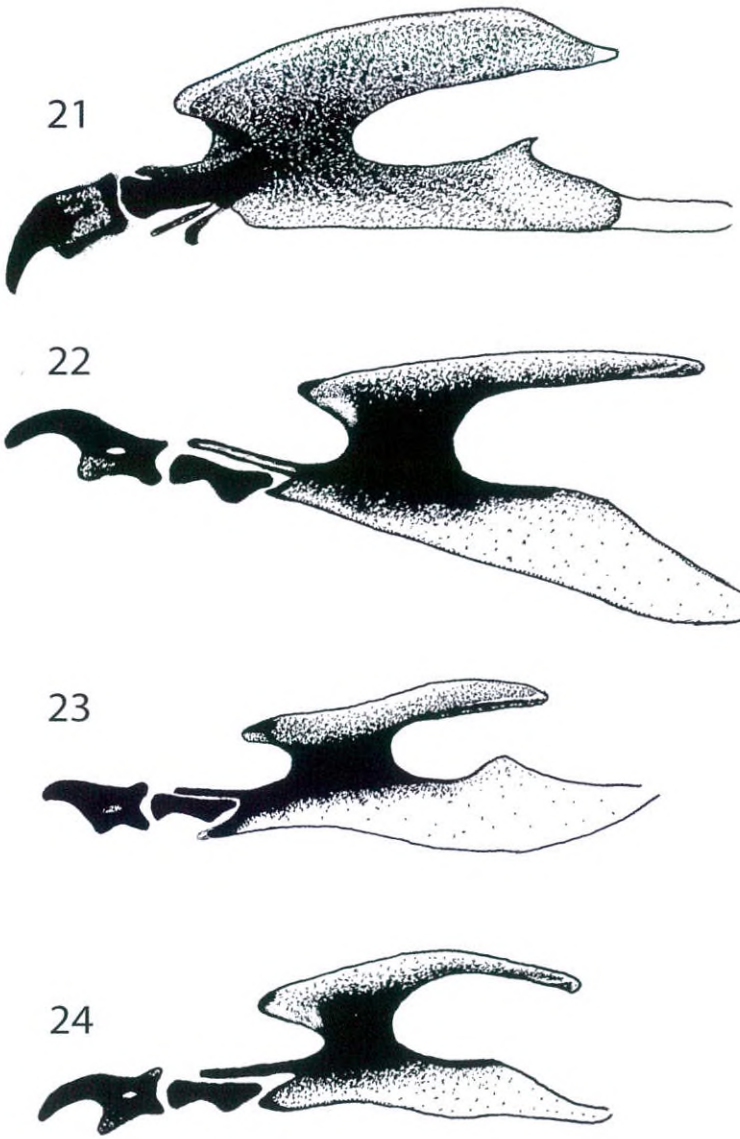
N. praeustum: anterior spiracles with 15 bulbs arranged in a U-shape flat against the integument (Fig. 14), inconspicuous projections on the anal segment (Fig. 5) and two groups of locomotory spicules with a gap between them (Fig. 9);

A. vulgaris: 15-16 bulbs in an upright fan (Fig. 16), triangular-shaped projections on the anal segment with the dorsal pair wider than the maximum width of the projection bearing the spiracular plate (Fig. 6) and locomotory spicules in one group of mostly transverse spicule rows (Fig. 10);

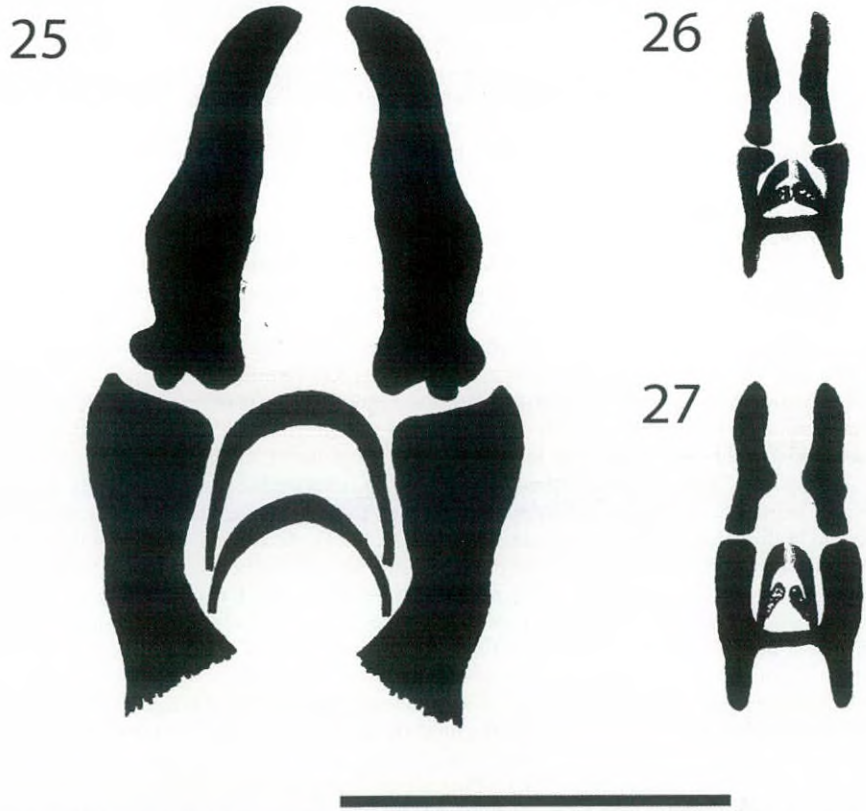
M. bipunctatus: 4 bulbs in an upright fan (Fig. 18), triangular-shaped projections with the dorsal pair about as wide as the maximum width of the projection bearing the spiracular plate (Fig. 7), laterally inclined rows of locomotory spicules, and medially a pair of transverse rows of larger spicules (Fig. 11);

P. varipes: 6 bulbs in an upright fan (Fig. 19), cylindrical projections on the anal segment (Fig. 8), and a double row of locomotory spicules (Fig. 12).

The three piophilines share more characters than with the neottiophiline, such as having a basal projection to the anterior spiracles, the form of the head skeleton and the greater lengths of projections above and below the posterior spiracles. Unique to *N. praeustum* are spicules on the dorsal surface of the thorax and abdomen and, apparently, the fleshy projections bearing sensilla along the lateral margin of the body. These characters may distinguish these subfamilies.



Figs 21-24. Piophilidae, larval head skeleton, lateral view, mandible to the left. 21, *Neottiophilum praeustum*, length 1.2mm; 22, *Allopiophila vulgaris*, length 0.5mm; 23, *Mycetaulus bipunctatus*, length 0.4mm ; 24, *Prochyliza varipes*, length 0.3mm.



Figs 25-27. Piophilidae, larval head skeleton, mandible and intermediate sclerite, ventral view, mandible uppermost, scale bar = 0.2mm. 25, *Neottiophilum praeustum*; 26, *Prochyliza varipes;* 27, *Allopiophila vulgaris*.

The form, pattern and number of striae varies across higher cyclorrhaphan puparia, from a complete absence to a complete coating; the latter state occurs in some of the piophilines studied here and also *C. furcata* (Freidberg 1981) and *P. megastigmata* (Ebejer 2012). Their origin lies in the manner in which the integument contracts and hardens during the processes of pupariation and repeatable patterns show that this process is not a random one and in such cases, they may be a source of reliable characters enabling puparia to the distinguished and identified. Ovoid ecdysial scars (Figs 13, 15, 17 and 19) appear to be unusual among higher Cyclorrhapha; this structure is more usually spherical in shape, see figures in Ferrar (1987). Between the spiracular slits are small projections from which, in other cyclorrhaphans, tufts of setae arise, the peristigmatical setae. Although these setae were not apparent in the material studied, they often break off. This is also apparent in the SEM images of the posterior spiracles of *N. praeustum* in Draber-Monko (2006) where single setae are sometimes present.

Other features, such as the pattern of locomotory spicules, are variable across the piophilid species studied here. For instance, the double row of locomotory spicules per abdominal segment in *P. varipes* also occurs in *P. casei* (Sukontason *et al.* 2001) but the number of rows is greater and variable in *N. praeustum*, *A. vulgaris*, *M. bipunctatus* and other piophilids (Hennig 1943). It is, however, the form of the head skeleton that most clearly unites and distinguishes the species studied here. Uniting them, all four share the characters of an incompletely sclerotised mandible, absence of obvious cibarial ridges and dental sclerites. Separating them, the head skeletons of the piophilines are similar to each other and very different to that of the neottiophiline (Figs 21-24).

However, Ebejer (2012) refers to dental sclerites in the head skeletons of *P. megastigmata* and *P. casei*. Through the kindness of Martin Ebejer, GER has examined the head skeletons of these two species and by the criteria of general resemblance and similar spatial relationships, the dental sclerites to which he referred are, in both cases, the labial sclerites. In both species and the piophilids studied here, the labial sclerites are well developed and generally larger than in many cyclorrhaphan families and appear as separate structures below the intermediate sclerite when the head skeleton is in profile view. In other cyclorrhaphans, labial sclerites, which originate from just in front of the ventral bridge of the intermediate sclerite, are small and inconspicuous. In contrast, dental sclerites are nearly always associated with the mandibles rather than the intermediate sclerite. They usually appear just below the lower, basal corner of the mandible when the head skeleton is viewed in profile and both structures share musculature (Roberts 1971). In ventral view, dental sclerites often extend across the gap between the paired mandibles, this is not the case with structure 'c', the 'dental sclerite' in Fig. 6 of Ebejer (2012). One or other sclerite is clearly missing in *P. megastigmata* and *P. casei*, and because structure 'c' is more similar in position and shape to labial than dental sclerites of other cyclorrhaphans, we interpret structure 'c' as the labial sclerite and hence, dental sclerites are also absent in these piophilids.

Cibarial ridges are thought to be associated with saprophagy (Dowding 1967, Ferrar 1987). Their function is separating and concentrating the microbes that form the diet of many cyclorrhaphan saprophages. Their reduction or absence in the piophilids studied here probably enables rapid processing of food through the head skeleton (Rotheray 2011). Fast processing is more obviously an advantage to *N. praeustum* than the piophilines. In piophiline larvae it is evidently not just microbes that make up the diet, but in carrion it includes decaying tissues and body fluids. Piophilids are not the only cyclorrhaphan saprophages to lack cibarial ridges. Others include Chyromyidae, certain Camillidae (Rotheray 2011), Heleomyzidae (Rotheray 2012) and certain derived Lonchaeidae (Rotheray and I. MacGowan, unpublished observations). The phylogenetic positions of these families (McAlpine 1978, Wiegmann *et al.* 2010) suggests that loss of cibarial ridges has occurred independently more than once and may be a specialisation for the same functional reason, extending the saprophagous diet.

Another factor explaining differences between the head skeletons of the neottiophiline and the piophilines is the power of the pump and mandible size. The neottiophiline head skeleton is about twice as large as that of the piophilines. However, the relative lengths of the mandible and the dorsal cornu are about the same for each species, the mandibles take up between 20 and 25% of the total length of the head skeleton and corresponding figures for the dorsal cornu are 75-80%. This suggests that any changes in the size of the head skeleton have probably occurred in proportion across these sclerites and probably across the entire head skeleton. However, when head skeletons are corrected for variations in body size, by expressing their lengths as proportions of the length of the second abdominal segment of the

puparium, an unexpected relationship occurs with *N. praeustum*, *A. vulgaris* and *M. bipunctatus* being similar in proportional length, 125, 123 and 134% respectively and *P. varipes* smaller at 75%. The functional significance of such a difference is unclear and without a phylogeny it is impossible to know whether one or other set of head skeletons has increased or decreased in size.

Qualitatively, however, the head skeleton of *N. praeustum* differs in shape from that of the piophilines: the mandibular hook is sharper and longer, extending down to the level of the lower margin of the rectangular base (Fig. 21); it is not as sharp or as extended in the piophilines (Figs 22-24); in *N. praeustum*, the intermediate sclerite is fused with both the basal sclerite and the parastomal bar, no such fusion occurs in the piophilines although the latter possess a sclerotised dorsal bridge which is absent in the neottiophiline; the dorsal cornu is slightly wider relative to the ventral cornu in *N. praeustum*, but it is markedly narrower in the piophilines (Figs 21 *v.* 22-24). The sharper and more developed mandibular hooks of *N. praeustum* probably facilitate piercing the skin of host birds and the fused intermediate sclerite is probably better at coping with relatively high compression forces occurring across the head skeleton when the mandibular muscles, which are inserted on the mandible and the basal sclerite, contract during piercing (Rotheray 2011). In feeding on less resistant material, similar mandibles and strengthened head skeletons are not required in the piophilines.

In a typical cyclorrhaphan head skeleton the dental sclerite appears as a small, triangular or comma-shaped sclerite just below the posteroventral corner of the mandible. It is poorly studied and more completely revealed in ventral view where it can be seen to extend under and between the paired mandibular sclerites. It is enveloped by that part of the pseudocephalon forming the posterior margin of the oral cavity (Rotheray 2011). Although in most higher cyclorrhaphan larvae the dental sclerite ends in this position, in some, such as certain camillids, it may extend even further, to below the intermediate sclerite (Rotheray 2011). Some of the adductor mandibular muscle fibres attach to it (Roberts 1971) and when these muscles contract, not only is the mandible moved downwards, but the dental sclerite moves back and down with the result that the posterior margin of the oral cavity is pulled open, both exposing the oral cavity for gathering food and helping to contain and channel it.

The absence of a dental sclerite in piophilids raises the question of how the oral cavity is kept open during feeding. Perhaps they use a different feeding mechanism. In *N. praeustum* it is simple to envisage how this could occur. Typically, food gathering in higher cyclorrhaphan larvae consists of extending the head into the food and gathering it by raking or rasping, using the mandibles and the soft pseudocephalon. The pseudocephalon also helps by containing and channeling food to the base of the mandibles where it is sucked into the atrial cavity by the pump in the head skeleton (Rotheray and Gilbert 2008). Raking and rasping probably does not occur when the larva of *N. praeustum* feeds. Instead, the functional role of the mandibles is piercing the skin and blood vessels of the host. Once the mandibles are inserted and the pseudocephalon pressed against the host skin, a seal will occur between it and the oral cavity and by repeated action of the head skeleton pump, blood can be sucked into the atrial cavity. Helping to tear the skin, break up clots of blood and possibly create the seal are a pair of unique, sclerotised, toothed combs that are part of the pseudocephalon and are in a homologous position as the facial mask in other cyclorrhaphan larvae, see illustration in Keilin (1924). Hence there is no need for a dental sclerite to keep the oral cavity open. If this is the feeding method, then it may explain another feature of the neottiophiline head skeleton, a large atrial cavity, which is revealed by the prominent ventral bridge and well developed labial sclerites which support it (Figs 21and 25). Laterally and dorsally, the atrial cavity is supported by the arms of the intermediate sclerite and behind the ventral bridge, the salivary

duct enters the atrium (Roberts 1971). A large atrial cavity optimises the process of mixing food with saliva (Rotheray 2011).

A related feeding method is probably used by piophilines, i.e. inserting mandibles into a semi-liquid food mass and sucking it up. Such a mechanism may be more effective when dealing with deep volumes of food, as probably characterise carrion. The three piophilines studied here also possess relatively large atrial cavities (Figs 22-24, 26-27), that will similarly optimise rates of ingestion and mixing food with saliva. Hence the presence of dental sclerites in the head skeleton appears to indicate a raking and rasping food gathering mechanism and their absence, insertion and sucking. Only close observation of actively feeding piophilid and other tephritoid larvae will confirm these structure function relationships and determine whether an insertion and sucking feeding mechanism, if it is present, uniquely defines the Piophilidae within the Tephritoidea.

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A recent record for *Villa cingulata* (Meigen) (Diptera, Bombyliidae) in Wiltshire – Keith Alexander's recent review of the occurrence of this species in Gloucestershire (2012. The Gloucestershire population of Downland Villa *Villa cingulata*. *Dipterists Digest* (*Second Series*) **19,** 96-97) prompts me to report a recent record from the neighbouring county of Wiltshire: a single female swept in late evening (approaching dusk) on 30.vi.2010 at Clattinger Farm, North Wiltshire, V.C. 7 (SU014934).

Clattinger Farm is a Wiltshire Wildlife Trust Reserve famed for its rich hay-meadow flora and the *Villa* was found when the reserve was in 'full bloom' - a few weeks ahead of hay cutting. A.E. Stubbs and M. Drake (2001. *British Soldierflies and their allies*. 512 pp. British Entomological and Natural History Society, Reading) mentioned that a male had been taken at wild parsnip (*Pastinaca sativa*) at the base of the chalk downs at Marlborough, Wiltshire back in 1914. So during further visits to Clattinger in early July 2010 searches were focussed on Apiaceae, especially pepper-saxifrage (*Silaum silaus*), which was locally abundant prior to the hay cut. This was supplemented by sweeping, but no other *Villa* was seen. Following the hay cut in late July 2010 searches were again made; by then the flowering herbs were restricted to the perimeters of the fields, and it was hoped that the more localised flower resource might make *Villa* easier to locate. But again no other individuals were found.

Whilst there are some similarities to the known calcareous grassland sites in Gloucestershire – notably the tall, herb-rich swards with an abundant flowering component, Clattinger Farm is under a very different management system – mostly cut for hay with aftermath grazing. The geology and topography also differs as Clattinger lies on the flood-plain of the Swill Brook, a tributary of the upper River Thames, and is on alluvium and Oxford Clay over gravels, rather than the steep valley sides of the Oolitic limestone within the Cotswolds. Though, as reported in Stubbs and Drake (*op. cit.*), on the basis of past records there is not total coincidence with calcareous situations – some Devon records perhaps being on metamorphic shales.

Whether *Villa* is resident at Clattinger, or the single recorded individual a stray from another site, remains a mystery.

I am grateful to Catherine Hosie and Paul Darby of Wiltshire Wildlife Trust, and Isobel Whitwam of Natural England for permission to sample at Clattinger Farm Reserve and SSSI -

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Dipterists Digest 2012 **19,** 125-127

Xylotachina diluta (Meigen) (Diptera, Tachinidae) rediscovered in the New Forest

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Summary
Xylotachina diluta (Meigen, 1824) is recorded from the New Forest, Hampshire for the first time in over a century. Details of the other British records are given and aspects of its biology are discussed.

Introduction
In August 2010 GE found a fully-grown larva of the Goat Moth *Cossus cossus* (Linnaeus) that had just vacated a burrow in a "cossus oak" on the edge of Denny Wood, New Forest, Hampshire (SU3405). In the hope of rearing the moth it was placed in a large plastic box containing moist potting compost. The larva immediately burrowed into the compost and could be viewed during the winter at the bottom of the container, where it adopted a slightly curled C-like posture. As spring advanced the larva disappeared further into the compost and could not be seen. About a month later a dense cocoon was retrieved from the box and placed in an emergence cage to await the appearance of the moth. On 26 May 2011 GE found two female tachinid flies in the cage and these were passed to R.J. Dickson, who identified them as *Xylotachina diluta* (Meigen, 1824). On opening the *C. cossus* cocoon, two vacated fly puparia were found located immediately to the front of the now slightly mouldy moth pupa. Close examination by R.J. Dickson revealed an exit hole in the abdomen of the host pupa.

Unaware of the above, on 9 June 2011, whilst inspecting the same "cossus oak", IP collected a male tachinid fly resting on bracken *Pteridium aquilinum* at the base of the tree. Later that evening, after consulting Belshaw (1993), it was identified as *X. diluta*. A further male was obtained the following day at the same tree, when it was seen resting on the trunk.

Verrall (1912) added *X. diluta* to the British List as *Sturmia ligniperdae* Brauer & Bergenstamm, 1891 from a pair taken at Lyndhurst Road, in the New Forest on a "cossus" tree on 1 July 1897. Wainwright (1928) included it as *Xylotachina ligniperdae* and repeated the record, saying that the pair was taken by Colonel Yerbury and was now in J.E. Collin's collection. Richards (1959) gave the only other British record of which we are aware, stating that in August 1958 larvae of *C. cossus* were obtained from an oak tree in a garden at Ascot, Berks. They were of two sizes, but seven larvae that were in the last instar in the spring of 1959 were all parasitised by *Xylotachina*, the flies emerging in the last few days of May, five or six flies coming from each host. The puparia were in the host cocoons.

Furthermore, it is not confirmed but very likely (Hans-Peter Tschorsnig *pers. comm.*) that "*Exorista fauna*" recorded from *Cossus ligniperda* [= *C. cossus*] by Meade (1882, 1892) and Buckler (1901) were misidentifications of *Xylotachina diluta*. *Exorista fauna* sensu auct. (= *Nilea innoxia* Robineau-Desvoidy, 1863) is unknown from the British Isles. These authors gave no localities but referred to G.C. Bignell and Dale as having reared the tachinid.

Biology

Xylotachina diluta is fairly unusual among British Tachinidae in being restricted to a single species of host. As the larvae of *C. cossus* may be concealed deep within the tree, this presents a problem for the ovipositing females of *X. diluta*. It is assumed that incubated eggs are laid on the trunk or in entrances to burrows and the host is contacted by the active first instar larvae, although direct observation on this seems lacking. As *C. cossus* larvae may take several years to mature and assuming that *X. diluta* has an annual life cycle, only final instar caterpillars would appear to be suitable hosts. Multiple occupancy of the host seems to be normal, although how this is routinely achieved, if the eggs are laid remote from the host, is not known. However, with a host that is large but which is present in small numbers, this would seem to be a sensible strategy. The behaviour of the males suggests that they may be holding territories around the "cossus oak," waiting for the females to return, although further observations are needed to confirm this.

Discussion

Oak trees infested with Goat Moth larvae are a well-known feature in the southern part of the New Forest. These "cossus oaks" with their resulting sap runs have long been known as a haunt of rare Diptera and have been frequently visited by entomologists for over a century, although apart from d'Assis-Fonseca (1952), very little has been published on the Diptera found visiting these trees. Considering the attention that "cossus oaks" have received, it is surprising that *X. diluta* has not been recorded more often and we can only assume that other factors may be limiting its distribution. The tree that provided the present records is unusual in a New Forest context in that it is in a fairly open situation, receives a fair amount of sunshine and has abundant ground vegetation in the form of bracken around the base; some or all of these features may be important for *X. diluta*. Oaks may play host to several generations of *C. cossus* as a neighbouring tree to the one in question was first noted to be inhabited by the species by the late D.M. Appleton circa 1970 (this tree apparently succumbed to the effects of the burrowing larvae, falling over in the spring of 2012; a *C. cossus* larva was seen emerging from the exposed root that autumn).

When IP first visited the New Forest in 1980, concentrations of "cossus oaks" were present in Denny Wood (SU334069) and by the Oberwater at Brockenhurst (SU302031) and Bolderford Bridge (SU291041). Some of these trees have since died and many others are now "dry" and seemingly unoccupied. During the last decade there appears to have been a worrying decline of *C. cossus* in the New Forest and with this trend repeated nationally, the future for *X. diluta* and its host is cause for concern. We hope to make further observations on *X. diluta* in the hope of finding out more about its ecology and would urge other entomologists who are aware of *C. cossus* populations to check for the presence of its enigmatic parasitoid.

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***Leptarthrus vitripennis* (Meigen) (Diptera, Asilidae) in Buckinghamshire** – A single male of *Leptarthrus vitripennis* (Meigen), identified using A.E. Stubbs and C.M. Drake (2001. *British Soldierflies and their allies*. British Entomological and Natural History Society, Reading), was found on dogwood *Cornus sanguinea* scrub on 15 July 2008 at Prestwood Picnic Site and Local Nature Reserve (SU867991) near Great Missenden in Buckinghamshire. The reserve consists of a steep west-facing chalk bank with a mixture of short and long grass and predominantly dogwood scrub. The species is easily distinguished from its congener *L. brevirostris* by more extensively red-orange legs and shorter hind metatarsus.

This would appear to be a similar habitat to that at sites where the fly had previously been recorded – **Surrey:** the North Downs at Box Hill, White Downs and Riddlesdown (Hawkins, R.D. 1998 *Leptarthrus vitripennis* (Meigen) (Diptera, Asilidae), a robber fly new to Britain. *British Journal of Entomology and Natural History* **11,** 12-14; Halstead, A.J. 2010. *British Journal of Entomology and Natural History* **23,** 197 (report of Annual Exhibition)); **Kent:** Bredhurst (Clemons, L. 1999. Kent Diptera 1998. *Bulletin of the Kent Field Club* **44,** 78-88), Saltbox Hill (Jones, R.A. 2000. Another specimen of *Leptarthrus vitripennis* (Meigen) (Diptera, Asilidae) from the North Downs. *Dipterists Digest* (*Second Series*) **7,** 83) and three further sites in 2003 (Jones, R.A. 2004. *British Journal of Entomology and Natural History* **17,** 170-171 (report of Annual Exhibition); **Oxfordshire:** the southern tip of the Chilterns at Hartslock (Chandler, P.J. 1999. New records of Asilidae (Diptera) at Hartslock nature reserve in Oxfordshire. *Dipterists Digest* (*Second Series*) **6,** 117); **Berkshire:** close to the latter site by Chris Raper in 2004; **Buckinghamshire:** the mid-Chilterns at Buttler's Hangings in 2003 (Merrifield, R.K. and R.M. 2004. *British Journal of Entomology and Natural History* **17,** 171 (report of Annual Exhibition)) and in 2004 at Grangelands by Martin Albertini (BMERC, Buckinghamshire and Milton Keynes Environmental Records Centre).

My 2008 record was then only the third record from Buckinghamshire. The fly has since been noted in the county in July 2012 by Martin Harvey (*Wycombe Wildlife Group Newsletter,* September 2012. **69,** 92) coming to MV light at Funges Meadow Nature Reserve, High Wycombe, in the heart of the Chilterns but in a river-plain wetland off the chalk, and just two days later was seen at Maple Lodge Nature Reserve in Hertfordshire, another wetland habitat. Both these records occurred during a hot spell similar to my 2008 sighting.

The earliest record at White Downs was only made in 1948, but despite the infrequent sightings since, Hawkins (1998) considered it unlikely to be a casual migrant because of the consistency of its localities and habitat, speculating that it may be an overlooked native. Given the ease in distinguishing this species it would seem surprising that it had been overlooked for so long, so either it is a genuinely rare native or there have been several migrations and attempted colonisations from France in the last 60 years or so. It has certainly been established at the North Downs for some time (where it seems always to occur in small numbers, as Jones (2004) noted, but recent climate warming seems to have enabled it to become established further northwards, in at least the south and central Chilterns from the end of the 20th century. A similar sudden spread northwards is exhibited by the box bug *Gonocerus acuteangulatus* (Goeze, 1778), long confined to Box Hill, but now frequent in the central Chilterns and elsewhere. The expansion of its range was accompanied by adoption of a more catholic taste in food-plants (originally only known from box *Buxus sempervirens*) and more general habitats (including my local churchyard on acid soil). It seems that something similar may be happening in relation to *Leptarthrus vitripennis*, for which the key factor may be less any particular habitat than warm summer temperatures, provided in the past mostly on south-facing chalk slopes but now more general. In this case it may turn up much more regularly in future - **TONY F. MARSHALL**, 49 Lodge Lane, Prestwood, Great Missenden, Bucks HP16 0QG; ecorocker@gmail.com

Vaillantodes miksici (Krek) (Diptera, Psychodidae) new to Wales –

A single male of this rare moth fly was taken in a flight interception trap set within a hollow oak tree *Quercus* within secondary woodland at Felin Isaf, Pendoylan in the Ely Valley, Vale of Glamorgan (V.C. 41; ST0679). The sample was taken on 6.vii.2012 but the trap had been open since 7.vi.2012. The oak tree had a trunk of 3.68 metres girth and was open to the north-west, exposing extensive development of red-rot of the heartwood.

Vaillantodes miksici was added to the British List by P. Withers (1989. A remarkable addition to the British moth-fly fauna. *Dipterists Digest* (*Second Series*) **2,** 38-39) based on material found by PJC on the Leckford Estate in Hampshire. It has subsequently been found in a few other sites including Burnham Beeches NNR in Buckinghamshire and Calke Park NNR in Derbyshire, but this is the first from Wales. Withers (*loc. cit.*) speculated that it may develop in tree rot holes and so the record reported here provides some evidence for this. The Calke Park record is similarly from a flight trap placed inside a hollow tree, *Tilia cordata* and the sample was collected on 11.vii.2012. The Welsh site is not, however, a rich site for rot-hole species, unlike some of the other known localities, so there appears to be no suggestion that it is associated with high quality sites. Its recent recognition in Britain may therefore suggest recent colonisation – **KEITH N.A. ALEXANDER,** 59 Sweetbrier Lane, Heavitree, Exeter EX1 3AQ and **PETER J. CHANDLER,** 606B Berryfield Lane, Melksham, Wilts SN12 6EL

Dipterists Digest 2012 **19**, 129-132

The first British record of *Wiedemannia lamellata* (Loew) (Diptera, Empididae) for more than a century

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Summary
Two males and two females of *Wiedemannia lamellata* (Loew) were collected in a kick-net sample at Whatley Brook in the Mendip Hills, Somerset, on 12 April 2012. These represent the second British record, the first being in 1891. The site is a small calcareous stony stream in ash woodland. The male genitalia are illustrated.

Introduction

The clinocerine genus *Wiedemannia* Zetterstedt has six species in Britain, four of which are nationally uncommon. Falk and Crossley (2005) gave *W. lamellata* (Loew, 1869) the status 'Data Deficient' since there were only two records on which to form a judgement, from Sutton Park, Warwickshire, in September 1891, collected by R.C. Bradley (Collin 1961) and Loch Assynt, Sutherland in 1911. The Scottish record has been found to be an error, and is discussed below. Falk and Crossley suggested that the species might be extinct. I collected two males and two females from a stream in the Somerset Mendips in 2012, making them the first records for well over a century.

Site and results

The collection site was the Whatley Brook as it flows through ash (*Fraxinus excelsior*) woodland of Leighton Hanging, part of Asham Wood SSSI, on Carboniferous Limestones and Shales (ST700443). The stream where sampled was 4 metres wide and the water depth in riffles was about 5-20cm deep. This point was about 50 metres from its discharge from Torr Works Quarry where limestone is quarried, and where most of its flow is derived from the quarry's settling lagoons. Its flow is regulated and remains more constant than it would if not receiving quarry discharge. The current is always moderately fast, and riffles tend to dominate over pools. However, despite these interferences with its flow regime, it has a natural aspect with a stony bottom set in a matrix of clay. Vegetation is limited to filamentous algae in a spring and a low covering of moss on protruding boulders. Its banks are undercut so that tree roots are exposed in places but the banks are only about 30-40cm high. The water is strongly calcareous.

Since 2006 I have monitored the aquatic fauna of this stream at two points within the same woodland in April and October each year as part of the quarry's Section 106 planning agreement. Animals were collected using a standard 3 minute kick-net sample and were preserved in alcohol in the field. In the sample collected on 12 April 2012, I retrieved two males and two females of *W. lamellata*, identified using Collin (1961) and checked against the key and description in Engel (1956). This species is one of the few whose genitalia Collin did not illustrate, but he compared them with those of *W. bistigma* (Curtis). That species has a conspicuous excision on the posterior margin of the terminal style and, although Collin describes a posterior excision in *W. lamellata*, this is not visible in side view. His description reads "... on the inner side, at the angulated corner above an excision on posterior margin, there is a small square projection bearing minute spines, and below it a similar but smaller

projection...". As Engel (1956) also placed some emphasis on these projections, I have illustrated them in posterior view (Fig. 1). The terminal style is brown in contrast to the rest of the black genitalia, as mentioned by Engel, and this feature is unique among *Wiedemannia* species, making it a useful character for field identification. One male and one female are deposited at the National Museum of Wales at Cardiff and the other pair is in my collection.

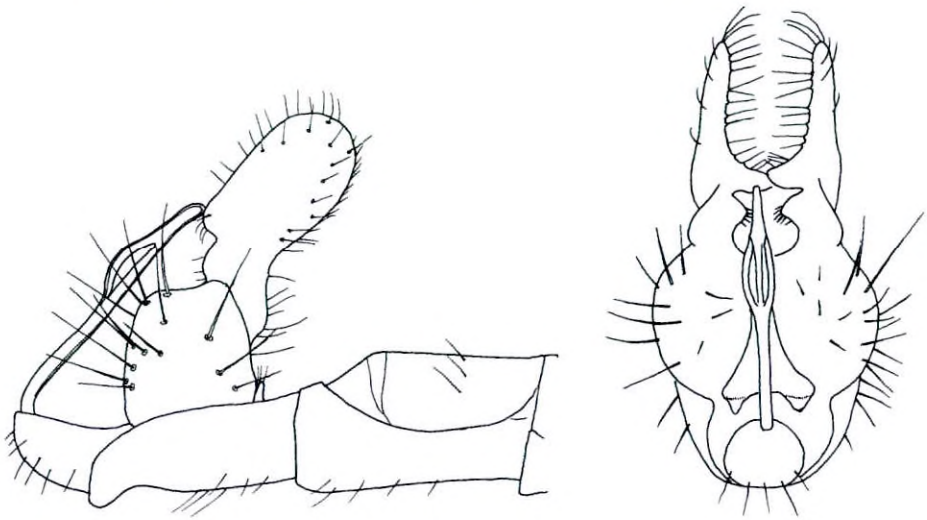

Fig. 1. Male genitalia of *Wiedemannia lamellata* (Loew) in side and hind view, drawn from a specimen in alcohol. Scale bar = 0.5mm.

Discussion

Larvae of *Wiedemannia* have been found in the Whatley Brook and two other nearby rivers, the River Alham and Nunney Brook, sampled as part of the same monitoring programme. One sampling station on the Nunney Brook has yielded adult *W. bistigma* on three occasions, and it was assumed that this was the species found as larvae elsewhere. At all three streams clinocerine and hemerodromiine larvae are sometimes numerous and I have occasionally collected adults or pharate pupae with identifiable males (including *Chelifera stigmatica* (Schiner) at the Whatley Brook). The larva of *W. lamellata* was described by Pomeisl (1953), so it may be possible to identify larvae in future samples.

Whatley Brook therefore appears to have the characteristics that suit these aquatic empidids. The other aquatic fauna here is typical of fast streams and reflects high water quality, although it is less species-rich than most other sampling points monitored locally. It supports a few nationally scarce species including a strong population of the caddis fly *Hydropsyche saxonica* McLachlan, which was once given RDB1 status although is now known to be more widespread (Drake 2009, Wallace 1991). Nevertheless, the stream clearly holds considerable interest.

Wiedemannia lamellata is found in central Europe, including most countries in the block between France, Poland and Bosnia & Herzegovina, with Greece and Turkey as southern outliers (Chvála 2011, Öz 2010). Horvat (1993) found *W. lamellata* to be one of the

more widespread aquatic empidids in a countrywide survey of Bosnia & Herzegovina and, in paraphrasing Chvála and Wagner (1989), he described it as "a widespread and common species throughout Europe". It is probably more common in warmer climates than found in Britain. Ivković *et al.* (2007) found that, in the Balkans, *W. lamellata* is tolerant to fluctuations in temperature, at least in the range 4-24°C, and it is more frequent in water where the mean annual temperature is higher than in constant-temperature cold springs. Marija Ivković (*pers. comm.*) has suggested that *W. lamellata* may be associated with limestone geology but, whereas the Mendips stream is on limestone, Sutton Park is on Permian and Triassic sandstones and has predominantly acidophilic vegetation. However, it is premature to suggest habitat preferences on the basis of two English records.

Enquiries revealed that both the Natural History Museum, London, and Oxford University Museum have specimens from the 1891 occurrence at Sutton Park, and the NHM also has the specimen on which the Loch Assynt record cited by Falk and Crossley (*op. cit.*) was presumably based. At Oxford there are, in the Verrall-Collin collection, a pair labelled "Suttn. 6.9.91", on which Collin evidently based his description. Peter Chandler kindly examined the specimens in the NHM collection, and has provided the following information. The 1891 male and female are in good condition and are definitely *W. lamellata*; they are labelled "S. 6.9.91" and "ex coll. R.C. Bradley. Pres. by Birmingham Mus. 1938". The Loch Assynt specimen under *W. lamellata* lacks both abdomen and hind legs, but it was possible to decide from other characters, such as deeper jowls, two strong humeral bristles and position of the stigma, that it is not *W. lamellata* but *W. insularis* Collin, 1927. It has evidently been misplaced at some time, and this would account for Collin (1961) not mentioning the record. This specimen was collected by Colonel J.W. Yerbury on 10 June 1911, on which day he collected from a stream near Ardvreck Castle on the shore of Loch Assynt. Another female of *W. insularis* labelled Loch Assynt in the NHM was collected by Yerbury on 21 July 1911 from the River Traligill that enters the loch not far from Ardvreck Castle; this is certainly the species (together with *W. bistigma*) that would be expected in north-west Scotland, rather than a mid-European species. These specimens would originally have been identified as *W. rhynchops* (Nowicki, 1868), of which Collin described *insularis* as a subspecies, which has since been raised to specific rank.

Acknowledgements

I thank Aggregate Industries UK Limited for permission to publish this note, Marija Ivković for confirming the determination and Adrian Plant for commenting on a draft of this manuscript. Erica McAlister and Zoë Simmons kindly provided details of museum specimens under the name *W. lamellata*. Peter Chandler added much useful information about the Loch Assynt specimens and from Yerbury's diary for 1911.

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***Metriocnemus beringensis* (Cranston & Oliver) (Diptera, Chironomidae) new to Britain –** In a collection of Diptera made on 22 June 2012 by Peter Chandler in the garden of Clarence House, London, were some Chironomidae, which he sent to me for identification. The occasion was a 'Bioblitz' arranged for National Insect Week, attended by HRH The Prince of Wales. Thirteen chironomid species were collected, all but three of which develop in fresh water and presumably originated from nearby St. James's Park Lake. The three terrestrial species among them, *Limnophyes minimus* (Meigen), *Limnophyes difficilis* Brundin and *Metriocnemus beringensis* (Cranston & Oliver) may be developing within the garden in damp moss or decaying leaves.

Metriocnemus beringensis has not previously been recorded for Britain, though recorded for Ireland (leg. Heneghan; Murray, D.A. 1996. Records of Chironomidae (Diptera) in Ireland: twenty-nine species new to the Irish fauna. *Bulletin of the Irish Biogeographical Society* **19,** 195-201). It was first described from Canada, as *Apometriocnemus beringensis* (Trout Lake, Yukon Territory; Cranston, P.S. and Oliver, D.R. 1988. Additions and corrections to the Nearctic Orthocladiinae (Diptera: Chironomidae). *Canadian Entomologist* **120,** 425-462). Since then its distribution has been extended to the Scandinavian subarctic, Norway, leg. Kaare Aagaard (Sæther, O.A. 1995. *Metriocnemus* van der Wulp: seven new species, revision of species and new records. *Annales de Limnologie* **31,** 35-64 and then southwards to Ireland (*loc. cit.*), also (D. Murray *pers. comm.*) leg. L. Heneghan, Misty Lough South, Co. Donegal, C014228, 3 April 1986 and leg. J.-R. Baars, Black Lough, Co. Tipperary, R738771, 10 August 2005, and France, leg. Phil Withers, Ain Department, 18 March 2008, Sainte Euphémie, jardin. It would appear to be widely distributed in the Holarctic, but local, or perhaps overlooked. Sæther (*op. cit.*) suggested that *M. beringensis* may be no more than a small form of *M. fuscipes* (Meigen). However, all the specimens in my collection have wing lengths that fall well within the range he gives for *M. fuscipes*, whilst retaining the other distinguishing characters of *M. beringensis* - **PETER H. LANGTON,** University Museum of Zoology, Downing Street, Cambridge (address for correspondence: 16, Irish Society Court, Coleraine, Co. Derry, BT52 1GX)

Dipterists Digest 2012 **19,** 133-134

Orthocladius (Orthocladius) carlatus (Roback) (Diptera, Chironomidae) in Europe

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Summary

A Nearctic species of Chironomidae, *Orthocladius (O.) carlatus* (Roback), is shown to occur in northern Spain, southern and north-eastern mainland France and Corsica.

Introduction

In the late 1980s Prof. Fernando Cobo of Santiago de Compostella University sent me some specimens of an *Orthocladius* species from a stream to the west of Santiago. The exuviae resembled those of *Orthocladius* (*Orthocladius*) *rubicundus* (Meigen), but were smaller and had pedes spurii B on segment III as well as II. The material included a pharate adult male. A field trip to Galicia arranged by Fernando Cobo in May 1991 provided many more pupal exuviae, but no further adult male specimens. The close similarity of the pupal exuviae to that of *Orthocladius* (*Orthocladius*) *carlatus* (Roback, 1957) as described by Soponis (1977) indicated conspecificity. In August 1992 on field trips in the state of Pennsylvania organised by Prof. William P. Coffman many pupal exuviae and two pharate adult male *Orthocladius* (*Orthocladius*) *carlatus* were collected. Prof. Henri Laville of Toulouse made extensive collections in Corsica during July 1995 (Laville and Langton 2002) and kindly presented a pharate adult female to the author. In August 1997 a second European pharate adult male was obtained from a river in the Vosges department of France. The pupa was included in the key to West Palaearctic Pupal Exuviae by Langton and Visser (2003) as *Orthocladius* (*O.*) Pe14.

Identification

Pupal exuviae, adult males and the pharate adult female from Europe, as well as pupal exuviae and adult males from Pennsylvania, conform to descriptions and figures and key to *Orthocladius* (*Orthocladius*) *carlatus* (Roback) in Soponis (1977). The pupal exuviae are characterised by granular markings across the posterior margins of sternites I-III (-VII) and less extensively on tergites I-III, anal lobes with apical teeth and pedes spurii B on both segments II and III. The adult male has small dorsocentral setae not set in pale spots, a triangular pubescent projection from the base of the gonocoxite (Fig. 1) and is pale in colour. Comparison of the pharate adult female with the figure in Soponis (1977) is complicated by the genitalia of the specimen being mounted ventral surface uppermost. whereas a lateral view is presented in Soponis (1977).

In the genus *Orthocladius* many species are Holarctic in distribution (Ashe and Cranston 1990); that *O.* (*O.*) *carlatus* is not restricted to the Nearctic is therefore no surprise. It is likely that it is much more widespread in the Palaearctic, but has been overlooked.

Pupal exuviae and adult males of *O.* (*O.*) *carlatus* and *O.* (*O.*) *rubicundus* are very similar and differ in the same ways that Soponis records for *O.* (*O.*) *carlatus* and *O.* (*O.*) *curtiseta* Sæther. A possible synonymy here is deferred until adult male *O.* (*O.*) *curtiseta* have been accessed.

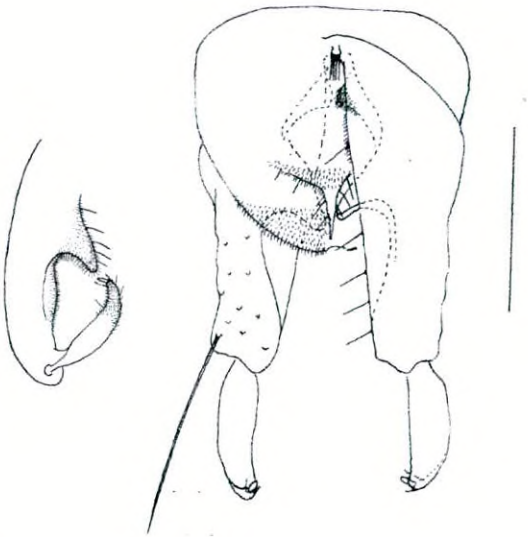

Fig. 1. Hypopygium of *Orthocladius (O.) carlatus*, dorsal left, ventral right (scale line = 0.1mm).

Distribution in Europe

SPAIN, Galicia, R. Sar 3.x.1986 (leg. F. Cobo), R. Ulla 26.v.1991, R. Piornedo 30.v.1991; FRANCE, Pyrénées Orientales, La Têt 26.v.1994, R. Aude 31.v.1994, R. de Llech 10.iv.2001; Vosges, R. Moselotte 27.viii.1997; Corse, Sagone vii.1995 (leg. H. Laville).

Acknowledgements

I am very grateful to Professors Cobo, Coffman and Laville for their generous hospitality, arrangement of field trips and donation of specimens to my reference collection.

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Dipterists Digest 2012 **19,** 135-141

Two new species of Orthocladiinae (Diptera, Chironomidae) from south-eastern France

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Summary

Pseudosmittia withersi sp. n. and *Metriocnemus malliarus* sp. n. are described from specimens collected by Phil Withers in south-eastern France, Ain Department.

Introduction

Amongst the insects collected in Malaise traps set up in nature reserves in south-eastern France, Ain Department, by Phil Withers were some Chironomidae which he sent to the author for identification. Two new species, belonging to the genera *Pseudosmittia* and *Metriocnemus*, were present in the collection.

Terminology is as in Sæther (1980).

Pseudosmittia withersi sp. n.

Etymology: named after the captor Phil Withers.

Holotype male: FRANCE: Ain. UTM 713/714 5080. Marais de Lavours, Béon, 29.vii.2008. Malaise trap (P. Withers). To be deposited in ZSM.

Paratype male: FRANCE: Ain. UTM 713/714 5080. Marais de Lavours, Béon, 17.vi.2008 (P. Withers). In the author's collection.

Description.

Body length 1.7, 1.84mm; wing length 0.9, 0.94mm. Colour: brown, head dark brown, scutal stripes dark brown, the median complete from anterior end of scutum to scutellum, the lateral broad and joined posteriorly to the median (Fig. 1a).

Head: antenna (Fig. 1b) with 13 flagellomeres, AR 1.06, 1.08; palpomeres 2-5 lengths 22/24, 22/28, 50/52, 64/72, 104/112µm; clypeus with 2 setae.

Thorax: possibly 2 acrostichal setae in mid scutum, 12 dorsocentral setae, 3 prealar setae and 4 scutellar setae; preepisternum and antepronotum without setae.

Wing (Fig. 1c): without macrotrichia, very finely dotted. Costa ending at R_{4+5}; R_{2+3} ending closer to tip of R_{4+5} than R_1; VR 1.7, 2.25. Veins without setae. Anal lobe very weak. Lengths (in µm) and proportions of legs (holotype without posterior tarsi, paratype without tarsi):

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5
p_1	320, 328	370,392	184	88	64	40	44
p_2	390, 408	400, 408	212	104	76	48	48
p_3	400, 404	440, 440	-	-	-	-	-

	LR	BV	SV	BR
p_1	0.5	3.7	3.75	3.0
p_2	0.53	3.6	9.6	3.14
p_3	-	-	-	-

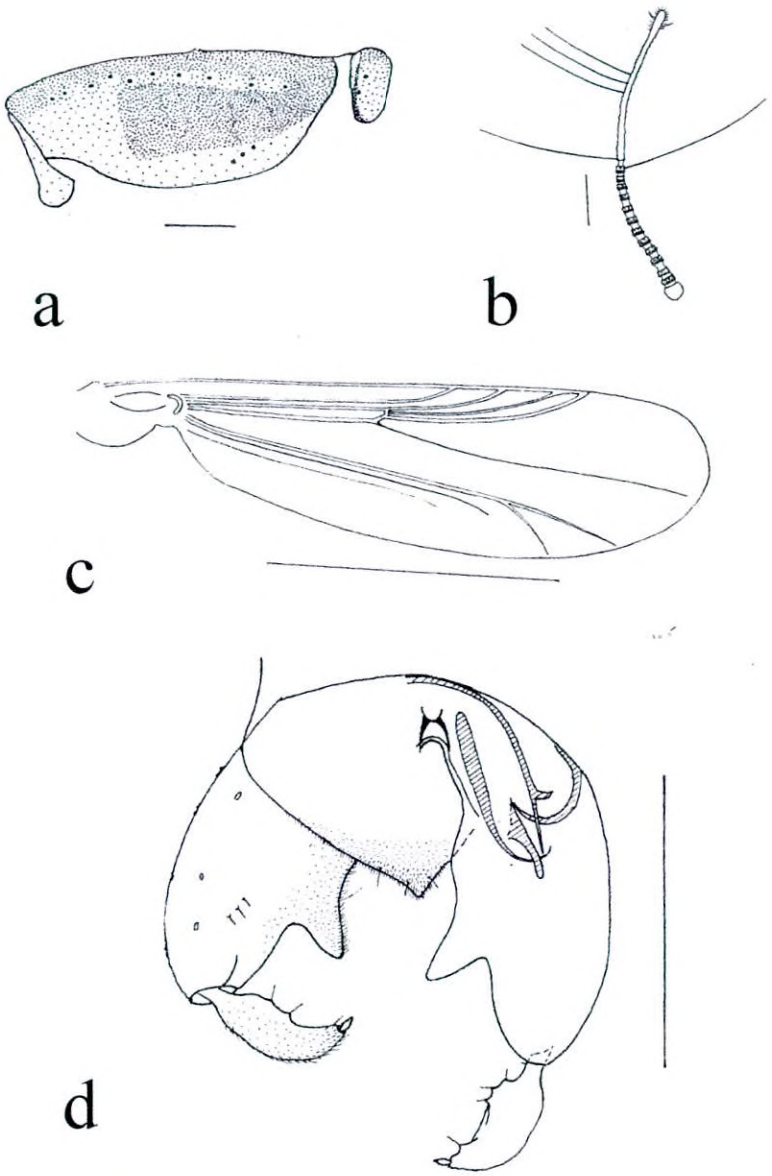

Fig. 1. *Pseudosmittia withersi* **sp.n. a, thorax, lateral view showing colour distribution (scale line 0.1mm); b, antenna (scale line 0.1mm); c, wing (scale line 0.5mm); d, hypopygium, left dorsal, right ventral (scale line 0.1mm).**

Spurs: tibia 1 with 1 (36, 38μm long), tibia 2 with 1 (28μm long, n=1), tibia 3 with 2 (20 and 30μm long, n=1); tibial comb on hind tibia of fine spinules, 20μm long; sensilla chaetica 5 on mid leg tarsomere 1; a pseudospur on each of mid leg tarsomeres 1-3, and 2 on tarsomere 4.
Abdomen: tergites with few setae arranged in an anterior and posterior transverse row.
Hypopygium (Fig. 1d): tergite IX narrowing to a right angled point medially, densely clothed with minute microtrichia and without setae, anal point absent; laterosternite IX with 4 long setae (n=2). Phallapodeme 46, 52μm long; transverse sternapodeme in a continuous arch with the lateral sternapodemes, oral projections absent. Virga of two widely separated spines. Gonocoxite 120, 124μm long; inferior volsella extended inwards as a strong thumb-shaped projection at about half gonocoxite length, narrowing to a point apically. Superior volsella very weak, bounded by a few setulae. Gonostylus 52, 54μm long, weakly curved, narrowed to apex and pubescent to tip. Megaseta 8, 9μm long. HR 2.3 (n=2). HV 3.3, 3.4.

Discussion
The bare eyes, wings and squamae, minute mid scutal tubercle, antenna without a subapical seta, costa not extended and lack of anal point place this new species in the genus *Pseudosmittia* (Cranston *et al.* 1989, Sæther 2006, Ferrington and Sæther 2011). The closest described taxon is Sasa's (1989) *Pseudosmittia* sp. kojimatertia, based on a single specimen swept by Lake Kojima, Japan, on May 2, 1987, lacking antennae and all tarsi. He refrained from naming the specimen because it was so incomplete. His description and figures are practically identical to that of the present species and, when further Japanese material becomes available, they may turn out to be conspecific. The specimens founder at couplet 8 in Ferrington and Sæther's key: the virga is U-shaped, but the spines are only 12μm long, the inferior volsella is well developed and the anal lobe of the wing is reduced.

Distribution and habitat
Known only from the holotype locality in south-eastern France, the Marais de Lavours, a national nature reserve. The area where the Malaise traps were set up was *Cladium mariscus* dominated marsh bounded by alder *Alnus glutinosa* (Phil Withers *pers. comm.*).

Metriocnemus malliarus **sp. n.**
Etymology: the species epithet refers to the long, dense macrotrichia of the wings (from the Greek μαλλιαρος, meaning hairy, shaggy).
Holotype male: FRANCE: Ain. L.G. 800.2108. Fondation Vérots, St. Jean-de-Thurigneux, 24.x-4.xi.2007. Malaise trap (P. Withers). To be deposited in ZSM.
Paratype male: Ain. L.G. 800.2108. Fondation Vérot, St. Jean-de-Thurigneux, 9.viii.2007 (P. Withers). In the author's collection.
Description. (This follows that of revisions of the genus *Metriocnemus* van der Wulp by Sæther 1989, 1995) (n=2 unless otherwise stated; the paratype is the smaller specimen and less complete: where n=1 is indicated, the holotype is the source).
Total length 1.74, 1.96mm. Wing length 1.2mm; width 0.34mm; width at anal lobe 0.16mm (n=1). Total length/wing length 1.6 (n=1). Wing length/length of profemur 3.92 (n=1). Coloration including knob of haltere brown.

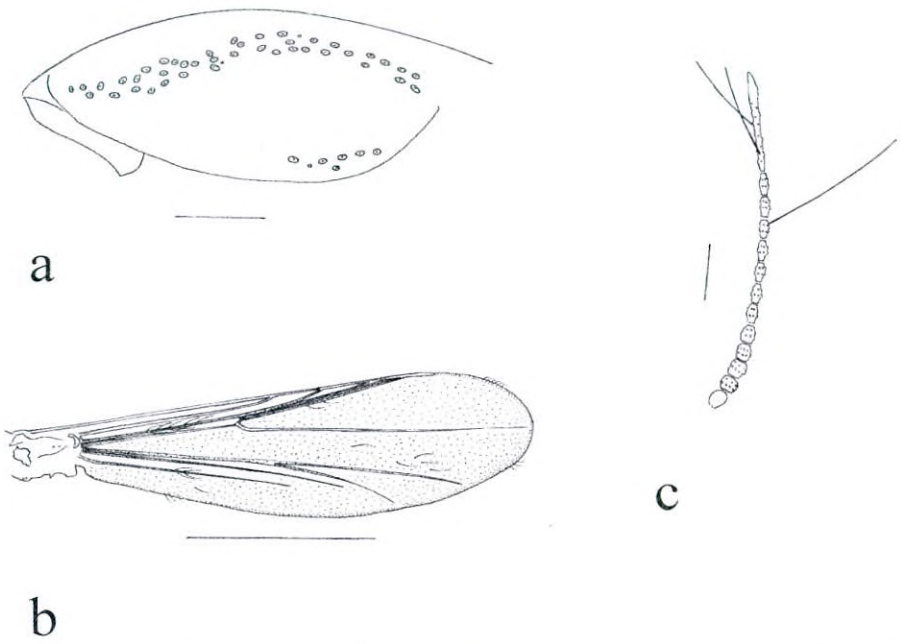

Fig. 2. ***Metriocnemus malliarus*** **sp.n. a, scutum, lateral view (scale line = 0.1mm); b, wing (scale line =0.5mm); c, antenna (scale line = 0.1mm).**

Head: antenna of 13 flagellomeres (Fig. 2c). AR 0.36, 0.43. Ultimate flagellomere 136, 176 µm long. Eyes bare. Temporal setae 10, 13; including 4 inner verticals, 3, 4 outer verticals and 3, 5 postorbitals. Clypeus with 12 setae. Palpomeres: 22, 28; 80, 96; 110, 128; 156 µm long.
Thorax (Fig. 2a): antepronotum with lateral setae indistinguishable. Dorsocentrals 35, 40, including 11, 16 on humeral area; acrostichals apparently absent; prealars 8 (n=1); supraalars 0. Scutellum with setae obscured in both specimens.
Wing (Fig. 2b): narrowed to base, anal lobe practically absent. VR 1.27, 1.31. C extension 72, 82µm. Cu_1 gently curved. Brachiolum with 2 setae, R with 27, 40; R_1 with 20, 29; R_{4+5} with 28, 39; R-M with 1, 2; M with 2, 6; M_{1+2} with 52, 73; M_{3+4} with 42, 51; Cu with 37, 47; Cu_1 with 20, 28; Pcu with 72, 83 and An with 41, 50 setae. Wing membrane covered with long macrotrichia, with about 41, 55 in cell m basally of R-M, macrotrichia length 40-80µm. Squama without setae.
Legs: spur of front tibia 24µm long; spurs of middle tibia 30 and 8µm long; of hind tibia 34, 36 and 8, 10µm. Comb of many fine spinules about 12µm long. Tarsomeres without pseudospurs. Small pulvilli present. Lengths (in µm) and proportions of legs (the paratype has most of the tarsi missing):

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5
p_1	432, 520	348, 424	400	288	200	124	64
p_2	440, 552	380, 492	280, 320	168	124	80	60
p_3	432, 520	440, 552	388	240	200	112	60

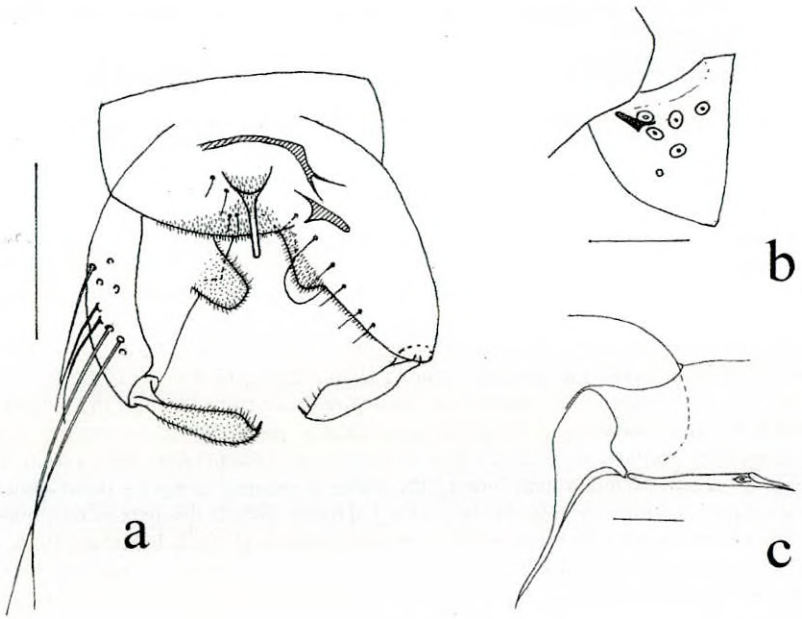

Fig. 3. ***Metriocnemus malliarus*** **sp.n. a, hypopygium (dorsal, left; ventral, right) (scale line = 0.05mm); b, abdominal segment 1 lateral (scale line = 0.1mm); c, apodemes of segment 1, lateral (scale line 0.1mm).**

	LR	BV	SV	BR
p_1	0.81, 0.82	2.0	2.36	2.2
p_2	0.86, 0.89	3.15	3.26	4.2
p_3	1.02, 1.06	2.3	2.76	3.0

Abdomen: tergites densely clothed with long setae, some of which on each segment are longer than the tergite. Tergite 1 with a conspicuous, dorsolateral black, subcuticular, anteriorly directed, spine-like structure (Fig. 3b) (see discussion).

Hypopygium (Fig. 3a): anal point dark, narrow, parallel-sided to slightly widened distad, rounded at tip, 28, 30μm long, with about 8 small setae at its base on the tergum; laterosternite IX with 5 long setae (n=2). Phallapodeme 36, 38μm long; transverse sternapodeme 60μm long, oral projections absent. Virga 10μm long (n=2), a conical bundle of fine spines. Gonocoxite 124, 140μm long; inferior volsella extended inwards as a strong thumb-shaped projection at about half gonocoxite length. Some setae on gonocoxite longer than the gonocoxite. Gonostylus 60, 66μm long, somewhat club-shaped; crista dorsalis narrow. Megaseta 5, 8μm long. HR 2.07, 2.1. HV 2.4, 2.97.

Distribution

Known only from the holotype locality in south-eastern France. For detailed information about the Pierre Vérots Foundation reserve see Withers (2007).

Discussion

M. malliarus sits between *Metriocnemus* and *Thienemannia* Kieffer in Cranston *et al.* (1989). Characters that favour its inclusion in *Thienemannia* are R_{2+3} ending near the end of R_{4+5} and pseudospurs lacking on the tarsi; in *Metriocnemus* the bare eyes and small pulvilli. However, the length of R_{2+3} in *Metriocnemus* is variable, in specimens of *M. albolineatus* ending well beyond halfway between R_1 and R_{4+5} (also see Sæther 1989, fig. 1c), even if not previously described as long as that in *M. malliarus*. The discovery of the pupae of *M. malliarus* will determine definitively to which genus the species belongs, but, at present, *Metriocnemus* seems the more likely.

Metriocnemus malliarus runs to couplet 5 in Sæther's (1995) key to *Metriocnemus*, where the AR of 0.36, 0.43 splits the couplet's limits (0.1-0.3/higher than 0.4). If the first alternative is taken, because of the anal point it runs to *M. shouclarus* Sasa from Japan; if the second, it founders at couplet 8, and pursuing each alternative causes problems in successive couplets and incongruous final destinations. *Metriocnemus shouclarus* (Sasa, 1989) differs from *M. malliarus* by having a broadly rounded anal lobe to the wing, a squamal fringe, a narrow triangular anal point, broad rounded inferior volsella and a rounded tooth towards the apex of the gonostylus.

An African species with a narrow, bare anal point is *M. fordi* Freeman, 1956 and it has a low AR (0.75-1.0) and no anal lobe to the wing. However, the inferior volsella has a distal notch, the gonostylus has two conical projections before the apex and the ninth tergite is conspicuously emarginate apically.

An interesting structure is described and figured (19g, h) by Sasa for *M. shouclarus*: a strong anteriorly directed spine on each side of tergite I. A similar structure is to be seen in *M. malliarus* (Fig. 3b); however, it is internal. Tergite I is depressed antero-medially to accommodate the postnotum, when the abdomen is flexed upwards. This depression is bounded laterally by a ridge that ends in a swollen boss at its anterior end, the boss being appressed to the postnotum. The bosses and ridges are supported by apodemes, in *Metriocnemus* particularly strongly sclerotised and dark in colour; the ridge apodeme is hinged to that of the boss by a narrow unsclerotised section (Fig. 3c). The ridge apodeme is brittle and breaks easily near its anterior end, leaving a structure looking very like a broad-based spine. The apodemes are invisible in very dark species of *Metriocnemus*, but show up in paler species, e.g. *M. albolineatus* Meigen. These structures are also to be seen in other Orthocladiinae, e.g. *Thienamannia*, *Parametriocnemus* Goetghebuer, *Orthocladius* van der Wulp and *Paracladius* Hirvenoja.

Acknowledgements

I am indebted to Phil Withers for sending me these specimens. Phil Withers acknowledges the management of Foundation Pierre Vérots and the administration of Entente Interdépartmentale de Démoustication for permission to work on the sites.

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Metriocnemus (*Inermipupa*) *carmencitabertarum* Langton & Cobo (Diptera, Chironomidae) in England –

M. carmencitabertarum was first described from material collected from granite rock pools in Galicia and a river in mid Portugal (Langton, P.H. and Cobo, F. 1997. *Metriocnemus* (*Inermipupa*) *carmencitabertarum* subgen. n., sp. n. from Spain and Portugal. *Entomologist's Gazette* **48,** 263-271). (*M. carmencitabertarum* remains the only species in the subgenus *Inermipupa*; all other *Metriocnemus* species belong to the nominal subgenus). Since then it has been reported from a municipal trough in the Azores (Murray, D.A., Hughes, S.J., Furse, M.T. and Murray, W.A. 2004. New records of Chironomidae (Diptera: Insecta) from the Azores, Macaronesia. *Annales de Limnologie* **40**(1), 33-42).

In August 2010 RSW discovered floating pupal exuviae in a wheelbarrow in his Mudgley garden (Somerset, ST448942) that periodically collects rainwater. These very unusual exuviae key easily to *M.* (*I.*) *carmencitabertarum* in Langton, P.H. and Visser, H. (2003. Chironomidae exuviae. A key to pupal exuviae of the West Palaearctic Region. Amsterdam: Biodiversity Center of ETI, CD ROM). The wheelbarrow had been used for transporting compost, but was relatively free of debris. In general, the species appears to favour small pools, particularly of a transient nature where competition is limited - **PETER H. LANGTON,** University Museum of Zoology, Downing Street, Cambridge (address for

correspondence: 16, Irish Society Court, Coleraine BT52 1GX) and **RONALD S. WILSON,** Mudgley Elms, Mudgley, Wedmore BS28 4TH

Records of species of fly (Diptera) for Ireland including two new to the Irish list – On comparing my inventory with 'An annotated checklist of the Irish two-winged flies (Diptera) (Chandler, P.J., O'Connor, J.P. and Nash, R. 2008 published by The Irish Biogeographical Society in association with The National Museum of Ireland), I discovered some species that I have not previously reported: Muscidae: *Phaonia magnicornis* (Zetterstedt), 18 August 2007, Co. Londonderry, Glenullin Bog, C795132, swept S. McBean. Chironomidae: *Tanytarsus miriforceps* (Kieffer), 28 March 2004, Co. Fermanagh, Keenaghan Lough G979600 (pupal exuviae); *Tanytarsus verralli* Goetghebuer (first recorded by Tokeshi, M. 1990. Chironomid fauna of Lough Neagh, Northern Ireland (Diptera: Chironomidae). *Entomologist's Gazette* **41**, 145-148; cited by McLarnon, L.A. and Carter, C. 2000. Chironomidae of Lough Neagh, Northern Ireland. *Verhandlungen des Internationalen Verein Limnologie* **27,** 2283-2387 and later by Langton, P.H. 2002. A preliminary survey of the non-biting midges (Diptera: Chironomidae) of Northern Ireland. *Bulletin of the Irish Biogeographical Society* **26,** 14-27), but not included in the checklist), 19 July 2000, Co. Donegal, Lough Altercan, B755158 and Lough Vorisky B762176; 22 August 2001, Co Londonderry, Lough Neagh at Ballyronan H948862 and Co. Antrim, Lough Neagh, Churchtown Point, J056852; 25 May 2003, Co. Galway, Lough Rea M625154, Ross Lake M200363, Owenriff River M112426, Lough Adrehid M055428, and 16 August 2011, Co. Fermanagh, Toppedmountain Lough (all pupal exuviae); 18 July 2003 Co. Armagh, Lough Neagh at Oxford Island J044621 (adult male in cobweb).

Tanytarsus palettaris Verneaux has been recorded for Ireland by D.A. Murray (2010. Records of Chironomidae (Diptera) in Ireland – twenty additions and notes on four morphotypes, *Bulletin of the Irish Biogeographical Society* **34.** 85-96); I took a further specimen as pupal exuviae in an artificial stream by a picnic site in Co. Galway on 25 May 2004, M204326 - **PETER H. LANGTON**, University Museum of Zoology, Downing Street, Cambridge (address for correspondence: 16 Irish Society Court, Coleraine, Co. Derry, BT52 1GX)

***Smittia amoena* Caspers (Diptera, Chironomidae) new to Ireland -** In a surface skim for chironomid pupal exuviae of the lower River Bann in Coleraine, Co. Londonderry, Northern Ireland (C854304), there were a few drowned adult males. One of these was identified as *Smittia amoena* Caspers, 1988 (Langton, P.H. and Pinder, L.C.V. 2007. *Keys to the adult male Chironomidae of Britain and Ireland.* Freshwater Biological Association Scientific Publication No. 64), a species not previously recorded for Ireland (Chandler P.J., O'Connor, J.P. and Nash, R. 2008. *An annotated checklist of the Irish two-winged flies (Diptera).* Irish Biogeographical Society and National Museum of Ireland, Dublin). Declan Murray kindly confirmed that it is new to the Irish list **- PETER H. LANGTON,** University Museum of Zoology, Downing Street, Cambridge (address for correspondence: 16, Irish Society Court, Coleraine, Co. Derry, BT52 1GX)

Dipterists Digest 2012 **19,** 143-150

The Reverend W.J. Wingate (1846–1912) and Durham Diptera

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Summary
An account of the writing of 'Wingate's Durham Diptera' and relevant parts of the biography of its author.

The Reverend William John Wingate died in October 1912, a hundred years ago. He wrote a book, *'A Preliminary list of Durham Diptera, with Analytical Tables'*, published by the Natural History Society of Northumberland, Durham and Newcastle upon Tyne in May, 1906, when he was 60. This book, known as 'Wingate's Durham Diptera', had a large sale and carried the name of Wingate far beyond his local community in the north-east. It contains 416 pages of text, describing 2,210 species in 60 families of Diptera. At the back of the book, are seven plates illustrating the terminology and external structures of flies. Plate 1 is shown here (Fig. 1). Following the preface and the introduction there is a glossary of terms, which includes German terms with the English words for the same structures. The order of presentation is based on Verrall's 1901 checklist of 2,884 British species. Wingate has included an additional 318 European species, '*... some of which have been found, and others may yet be found in Britain.*' It is an honest attempt by a student of the Diptera to help others to make a start with the subject. So, for the Cecidomyiidae he writes: *'I have not attempted these difficult little flies, whose study involves minute microscopical work. They ... await the advent of some young clear-sighted, patient entomologist.* And for Chironomidae he writes in a similar vein: '*I have not paid much attention to this very large and difficult Family. I give the following tables containing a large number of the British species, extracted chiefly from Schiner and Zetterstedt, in the hope that it might prove helpful to some beginner.'*

He gives records of those species that he has found in the Durham district, and brackets the names of those species he has not yet encountered. Sometimes he gives notes such as, 'Larvae have been found under stones', or 'Life history unknown.'

The book was reviewed in the journal of the Yorkshire Naturalists Union, *The Naturalist*, of August 1906, where the reviewer ('R') wrote:

'English dipterists (or dipterologists) have so little literature in their own tongue available .... that they cannot but feel grateful in the highest degree to Mr. Wingate for furnishing them with a work so well calculated in its plan to help the young dipterologist to make out his captures. The dichotomic or tabular method adopted here is a very useful one, as drawing attention to the diagnostic points, and likely to assist the beginner in making out, at any rate, the well-marked and more distinctly characterised species. The actual value of any such tables is not to be gauged by a reviewer, and can only be judged after prolonged use in the actual determination of species.'

Wingate's Durham Diptera was described in the Transactions of the Natural History Society of Northumberland, Durham and Newcastle-upon-Tyne, in a paragraph noting his death in 1912 as ' ... *his modestly named 'Catalogue of Durham Diptera', published as the second volume of the new series of Transactions, has had a large sale, as being only real introduction to the study of Diptera in the English language'*

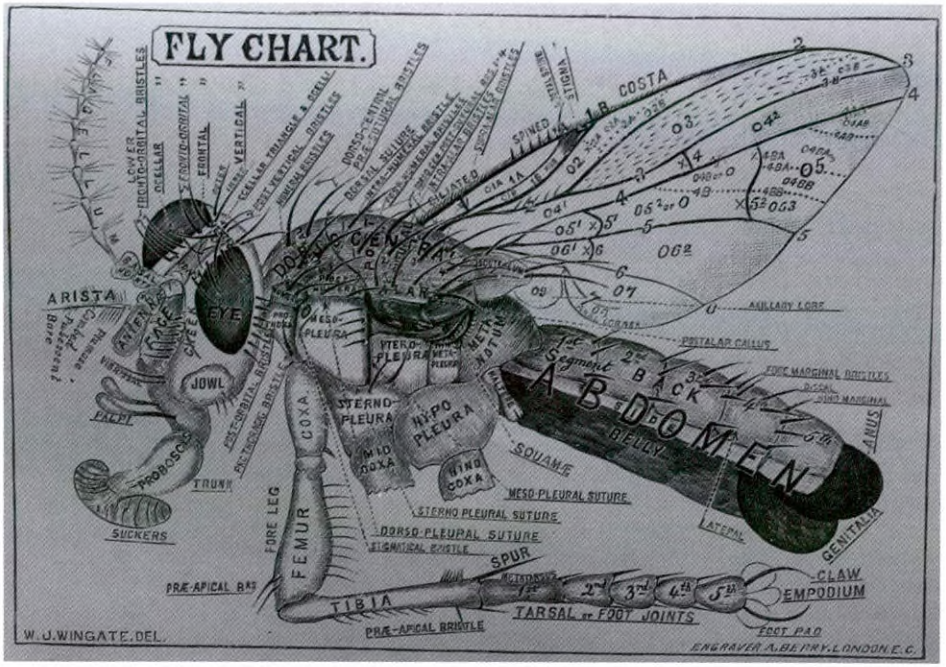

Fig. 1. Plate 1 from Wingate's Durham Diptera.

Many young student dipterists must have owned and used a copy during the inter-war period, and before the advent of the Royal Entomological Society keys. The author's copy was once owned by someone in Shrewsbury, a long way from Durham, and has the date 1913 written inside. It has about 20 correction slips pasted inside, together with some typographical corrections and annotations and it looks well-used. Every contemporary specialist will spot errors, and omissions, some peculiar to that time of writing and others perhaps due to assimilating and adapting the works of a number of European authors, which Wingate, like all other workers, had to do.

Wingate was born in Glasgow on 19 August 1846. His father was William Wingate of Nether Croy, Dumbartonshire, a silk merchant, comfortably off and employing several servants. His mother was the daughter of a London solicitor and they were married at St. Martin's in the Fields, London. One of several siblings, William John was educated at Glasgow High School, Merchiston, and St Aidan's, Birkenhead. He was ordained a Deacon in 1879 when he was 33 years old, and then as a Priest in 1880. Nothing is known of his life before this. He occupied a curacy at St Paul's, Hendon, Sunderland, from 1879-1882, and was married there, aged 36, to Alice Durnford Iliff, on 1 June 1882. He then moved to a curacy at Gateshead from 1882-1883 where his daughter Alice was born on 16 May 1883. From 1884-1892 he was Vicar of St. Jude, South Shields, where, in 1889, a son, William Iliff Wingate, was born, and a daughter, Ethel Wingate, was born in 1892. From 1892-1897, he was Vicar of Marley Hill and it was around 1896, when he was about 50 years old, that Wingate began to take an interest in the Diptera (two-winged flies). In 1887 he left Marley

Hill and was appointed Vicar of St. Peter's, Bishop Auckland, where he remained until just before his death at the Northwood Nursing Home, Northwood, London, on 19 October 1912, at the age of 66. His probate record states that his effects were 1,927 pounds, 19 shillings and 9d. In a paragraph in the Transactions of the Natural History Society of Northumberland, Durham and Newcastle-upon-Tyne, noting his death, it says *'he was a good botanist, and a good geologist as well, and by his energy as an organiser and lecturer he did great service to the local scientific societies of the county of Durham.'*

Rev. W. J. Wingate.

After working for 10 years in the industrial towns of Gateshead and South Shields, in 1892 Wingate, aged 46, moved to the rural parish of Marley Hill. In a piece he wrote under the heading 'Durham Diptera' in 'The Naturalist' (pp 269-288) Wingate (1903) graphically describes his first stirrings of curiosity and interest in the Diptera which was stimulated by the countryside around him. He wrote:

'About six or seven years ago, when old Natural History tastes had been revived by country residence after years of town work, I thought how stupid it was not to know anything about the common flies which crowded the windows in summer. So I turned my attention to the Diptera, and since then I have been collecting in the County of Durham only.'

In the Preface to his book, he writes,

'It does seem strange, that what I may call our 'Domestic Insects' should receive so little attention, that very few, even among entomologists, can point out with any certainty the common House-fly or distinguish between the Blue-bottles. ..... And yet no order of insects has so many interesting and varied life histories, and none so deeply affects the human race, whether as protectors when acting the part of scavengers, or as depredators destroying crops, or as scourges carrying deadly micro-parasite.'

So, in about 1897, when he was 50, he set about collecting and trying to put names to all of the local species of Diptera. His chief guides were Schiner's *Fauna Austriaca*,

published in Vienna in 1862, and Verrall's Checklists of British Diptera. He also borrowed Zetterstedt's 12 volume books in Latin, on Scandinavian Diptera from the library of the Dean & Chapter of Durham Cathedral, but had to return it after four years. Other authors he consulted included Becker, Macquart, Loew, and Verrall's book on the Syrphidae, published in 1901. Wingate was helped by Dr R.H. Meade of Leeds, and by G.H. Verrall. In addition, in his book, he acknowledges help from some of the leading dipterists of the day: Mr Austen, Col. Yerbury, Mr Henderson, Mr Wainwright, Herr P. Stein, Mr Grimshaw and Mr Collin. In 1901 he sent a letter to J.E. Collin, dated 12 March, asking for information about *Heleomyza ustulata* Mg and *Blepharoptera pusilla* Lw [currently *Suillia ustulata* (Meigen) and *Neoleria pusilla* (Loew), the latter not a British species] and Collin wrote back offering to examine Wingate's specimens, something he may later have regretted! Without the considerable help given by Collin and others Wingate may well have been defeated by his task, but with admirable persistence he bothered Collin and Collin to his great credit, responded, until many of Wingate's problems were sorted out. This relationship is documented in a series of letters to Collin and to George Verrall between 1901 and 1906, which are fortunately preserved in the Oxford University Museum of Zoology Archives.

From 1901 Collin was bombarded by questions, but, as if to soften the blows, Wingate rarely uses a question mark! Here are some examples:

- *Can Mr. Verrall give me any character by which to distinguish Dolichopus wahlbergi Ztt from D. plumipes Scop.*
- *... and also D. pennatus Mg. from D. signatus Mg*
- *Is Mr. Verrall's Dolichopus picipes Mg the same as Schiner's D. fastuosus Hal.*
- *I have opened the packet to ask a question. Do you know if it has been ascertained if Schiner Vol. II p 342 was right in his suggestion that Phora nigricornis Egg might be the male of Ph. opaea*
- *With regard to the fly I had named Scatophaga arrogans Hal but which you have altered to S. squalida Mg (Becker) do you think you are right or is Schiner wrong?*

He wrote directly to Verrall on a number of occasions but, perhaps because Collin was more responsive, he often addressed Verrall through Collin. He also exchanged specimens with Collin and often included in the postal box specimens that he found difficult to identify, ' to fill up the space.'

Wingate's initial aim was to publish a list of the Durham Diptera, and this he did in the Naturalist of 1903, but by the time he came to write his book he had formed a broader educational aim. Another source of his motivation came from his contact with the young naturalists around him, perhaps at the Durham County Naturalists' Union which he founded in 1902 and where he was Secretary. In a letter to Verrall dated 10 August 1905 he wrote,

'I have had many enquiries from young fellows wanting to begin the Diptera and have always had to reply "Do you read German, for there is no book in English except Verrall's Syrphidae and articles in entomological magazines?'

and again, in the same letter: *'I am too much of a tyro at diptera to be likely to be of any service to specialists. The only thing I am hoping to do is to make it a little easier for young naturalists in our north counties to make a beginning with Diptera. I am only a beginner myself and I know a beginners difficulties. So in a local list that the Newcastle Natural History Society is now publishing I am giving a pretty full explanation of parts and terms and numerous tables.'*

Perhaps Wingate sometimes taught children at the local Church School. On many occasions he emphasises his role as a teacher rather than a specialist and was aware of the importance of this role in the encouragement of beginners. In a later letter to Verrall dated 19

June 1906, in response to Verrall's worries about over-confident but unreliable identifications by beginners, Wingate writes, *' I do not see how that can be helped .... He is far better to go on and make mistakes than never to go on at all.'*

The Reverend then goes on to coin an appropriate parable.

'All I want to be is like some fellow paddling in the shallows who calls out to another on the shore who is frightened to enter the water, 'it is not cold, and it is not deep, come on.' Once he is in and enjoys and wants to go deeper I leave it to you and other fellows farther out to teach him to swim. I cannot swim myself.'

In his preface, in describing his battles with the literature available to him, Wingate writes:

'Many a time I have pounced upon some descriptive list of local species in transactions and magazines, hoping to be able to identify some specimens I had taken, only to find that the learned phraseology, the want of analysis indicating the points of difference, and the unnecessary repetition of points of agreement, made it an almost hopeless task. Life is too short for this weary groping after the undefined, but a short life may be practically lengthened if one is able quickly to begin where a predecessor has left off.'

It may fairly be said that, in his attempt to introduce the fascination of the Diptera to a wider group of naturalists, Wingate was the fore-runner of Charles Colyer and Cyril Hammond, although unfortunately without the artistic skills of the latter. From his own initial ignorance he understood the problems of other beginners, and indeed of all naturalists, in becoming familiar with a new group. He had the vision, determination, and the opportunity to take a step to remedy this.

Most of Wingate's collecting of Diptera was carried out in the 4 years between 1898 and 1902. In the Journal of the Yorkshire Naturalists Union, *'The Naturalist'*, of July 1903, in a paper entitled 'Durham Diptera' (pp. 269-288) Wingate listed the 17 localities where he collected, and these sites are also listed in his book. One of them is by the sea near Hesleden and others are in Weardale, by the River Wear or its tributaries, and he included some descriptions. I have added some grid references, and some of Wingate's records.

Barnard Castle - NZ0516

Bedburn – NZ1032 (*Nephrotoma crocata* (Linnaeus) recorded here)

Belburn – River near Binchester. NZ2164931797. Strip of wood and stream below Auckland.

Bishop Auckland – NZ2228. 350ft. Wingate wrote: 'Practically the small plot of ground round this vicarage.'

Bollinghope Common – NY9834 - 700-900 ft. A dale running into Weardale.

Brancepeth – NZ2338

Deepdale – NY9615

Evenwood

Escombe, 350 ft. Wooded Wear banks above Auckland

Gibside - North Durham. NZ176589. 100 - 400 ft. Wooded estate (Snipes Dene Wood) on the River Derwent, about 7 miles south-west of Newcastle.

Gibsonees

Harperley – NZ17463 53017 400ft. Wooded Wear banks (*Tricyphona unicolor* (Schummel), *Nephrotoma cornicina* (Linnaeus), *N. lunulicornis* (Schummel), *Tipula subnodicornis* Zetterstedt and *Dactylolabis transversa* (Meigen) recorded here)

Hesleden – South Durham. NZ 4438 (perhaps where Wingate lodged). Sea-shore, flowery sea banks, sandhills, wooded dene and farm land, about 3 miles north of Hartlepool. Collected mostly during the holiday month of August.

Marley Hill – North Durham. NZ203581, 500-700 ft. On the ridge east of Gibside; rather bare colliery district (Wingate was vicar in this parish).

Raby – Near Raby Castle and Park: NZ 12893 21807
Shipley Moor, Shipley Glen – 400-700ft. Wooded glen with bog at the top.
Shull – Near Consett. NZ07653 82487 600-900 ft. Pine woods with stream.
Stanhope – NY9939 - 700-900 ft. Wooded dene.
Waskerley – NZ05092 45442. 700-1,300 ft. Wooded glen and moorland (*Euphylidorea meigenii* (Verrall) recorded here).
Wearhead – NZ17633 53397 1,000-1,500 ft. High dales and moors (*Idioptera pulchella* (Meigen) recorded here).

Most of his specimens were obtained from Bishop Auckland, followed by Hesleden and Harperley. A few were also obtained from Deepdale in Yorkshire.

Wingate's collection of Diptera is housed in a glass-fronted cabinet (opposite), in 36 numbered glass-topped store boxes (Fig. 3), stacked on their sides like books on a shelf. To evaluate the collection as a whole would take a number of specialists many weeks of work to carry out. There are signs that the collection has been examined previously on many occasions, but the only publication that I am aware of is by Andrew Grayson who examined the seven species of Tabanidae (horseflies) (Grayson 2004).

The author examined only part of Wingate's collection - the Craneflies (Tipuloidea), which are located in five glass-topped store-boxes numbered 5 to 9. Nos 5 and 6 contain the 'Limnobidae' (Limoniidae 38 species, and Pediciidae 6 species) while Nos 7-9 contain some 31 species of the Tipulidae, making some 75 cranefly species in the collection as a whole. It is presently stored as part of the Hancock Collection, in the basement of the Discovery Museum, Newcastle-upon-Tyne. The specimens are carded and labelled spaces are left in the boxes in anticipation of future captures.

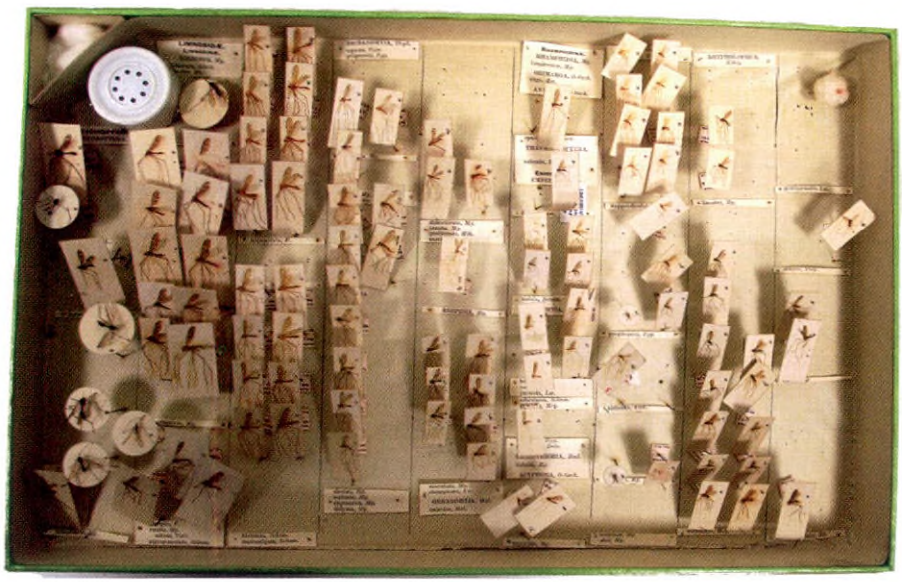

Fig. 3. Box 5, from Wingate's collection.

A detailed report on the collection is available from the author (Kramer 2012). Perhaps the most surprising specimen of the collection is a male *Ctenophora ornata* Meigen in Row 6 of box 9 (below). The label states: Bishop Auckland, - - 07, Wingate. In Europe, the species has been recorded in Denmark and Sweden, and so a more northern British habitat is not problematic. But, to the best of my knowledge, *C. ornata* has never been recorded north of Sherwood Forest in Britain, and its presence in the collection raises some interesting questions. Is it an authentic specimen added to the collection by Wingate after completion of the book? If so, had it arrived as a pupa in imported timber? It would be good to know something of the history of this specimen and there should be a record of this striking insect somewhere, even in the local press at the time of capture.

So what of Wingate's legacy? Since his time the fascination with flies and their lives has increased and more people study flies than ever before. Progress has been made with their ecology, taxonomy and the discovery of new species. Wingate's educational purpose, perhaps the chief aim of his work, has been taken up by other authors and in other books.

Other important things that Wingate has left us are his records and his voucher specimens. If we want to know the rate at which our environment is changing, the disappearance of our native species is as good a sign as any. They act as indicators, which allow us to identify changes in the environmental components for a given region. For example, decline in some species can signal a decline in ground water to dangerous levels. Sometimes the effect of climate change is positive, as on populations of some disease vectors. It is only by comparing today's species lists with well-curated collections of plants and animals recorded in the past, that we will be able to make informed judgements and perhaps to survive in the future. Wingate's carefully made, documented and curated collection is a rare and valuable dataset to help us. The Discovery Museum deserves our gratitude for conserving an important part of our heritage, and it would be interesting to follow in the footsteps of Reverend Wingate to discover if the species that he recorded are still to be found in their old localities.

Acknowledgements

Thanks to June Holmes, Archivist of the Natural History Society of Northumbria, who sent me biographical details and grid references of some of Wingate's sites that I was unable to locate, and who made many documents available from the archives. I am grateful to Dan Gordon, Keeper of Biology at the Hancock Museum, for access to the Wingate Collection. I am also grateful to Adrian Pont who alerted me to the presence of the Wingate letters in the Hope Department Library and to Kate Santry for making these letters available.

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Dipterists Digest 2012 **19,** 151-154

A first record of *Machimus cowini* (Hobby) (Diptera, Asilidae) on the British mainland

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Summary

Details are given of the first authenticated occurrence of *M. cowini* (Hobby, 1946) on the British mainland with a brief summary of the currently known world distribution of the species, based on existing literature.

Current published records

Machimus cowini (Hobby, 1946) was originally described from the Isle of Man (Hobby 1946) and has since been regularly recorded from that island and from the east coast of Ireland. Speight (1987) mentioned records from The Netherlands, France, Germany and Hungary, while Belgium (Tomasovic 1993), Croatia (Tomasovic 2000) and Romania (Weinberg 1995) have since been added to the list. Reemer (1999) added a number of additional Dutch sites while Barkemeyer (1994, 1995) and Wolff (2000, 2005) added additional German records but the species has never before been found on the British mainland. Two *Machimus* specimens taken at Harlech, Wales in 1969 by P.N. Crow, originally recorded (incorrectly) as *M. cowini* and deposited in the Natural History Museum London, are actually referable to *M. cingulatus*. The corresponding records under *M. cowini* on the NBN database, at time of going to press, have been so annotated.

The new record

The contents of a water trap set as part of a survey of Foulshaw Moss (Cumbria) in 2006 was sent for identification to RW who recognised a male *Machimus* specimen in the sample as a probable *M. cowini* using characters given in Stubbs and Drake (2003) and Smart (2005). It was passed to MJS for confirmation. Because the specimen had been captured in water and dried out in a somewhat crumpled condition, some diagnostic characters were obscured. The specimen was rehydrated, treated with degreasing chemicals and redried in a more convenient pose with the body pile returned to its original state.

The specimen (Fig. 1) has all six femora black with the orange apical rings typical *of M. cowini* and there is just a hint of a posterodorsal orange patch at the base of the posterior femora. It does not have the character of a tab on sternite 8, a median extension of the posterior margin that is characteristic of male *M. atricapillus* (Fallén). The hair-like long pile on sternites 2–4 is fine, like that of the anterior sternite, and does not all become progressively more bristle-like posteriorly as in *M. cingulatus* (Fabricius) (Smart 2005). Comparison with specimens of the type series of *M. cowini* in the Oxford Museum and with more recently collected specimens from the Isle of Man reveals no significant differences (the extent of the small orange basal patches on the hind and mid femora is variable in this species). It is therefore concluded that the specimen is without question *M. cowini*.

The new site is Foulshaw Moss Nature Reserve (SD458836), which is an area of lowland raised bog dominated by *Sphagnum* moss, purple moor-grass, cross-leaved heath and bog-myrtle. Birch woodland is present on the northern perimeter. Foulshaw Moss was

afforested with Scots pine and western hemlock in the 1950s and 1960s and is currently undergoing restoration management work by Cumbria Wildlife Trust. The location the species was taken from is a small area of the bog that avoided coniferisation and still retained remnant bog vegetation dominated by *Sphagnum* moss, heather and cotton grass (Fig. 2). It is approximately 3km from the main part of the tidal Milnthorpe sands (scarcely more than 1km from their extreme extent) in the estuary of the river Kent, an area corresponding better to other known habitats for this species than the known Cumbrian site.

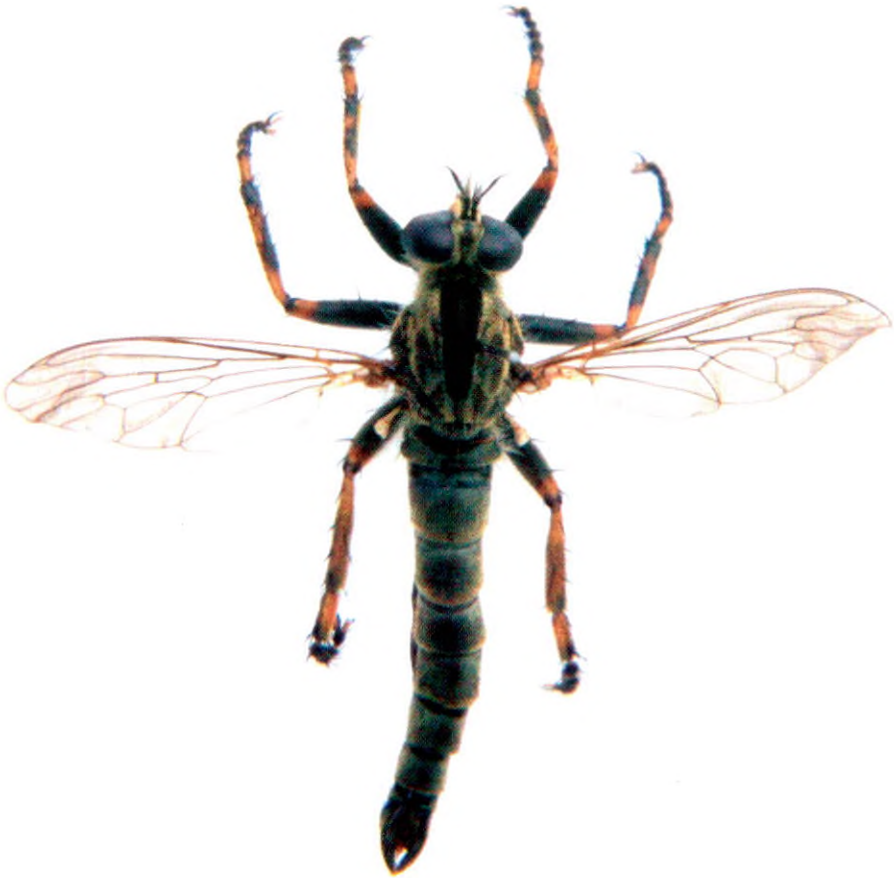

Fig. 1. *Machimus cowini* from Foulshaw Moss showing characteristic femoral markings.

The water trap was emptied on 25.vii.2006 after being in place for three days. It consisted of a yellow plastic tray approximately 20cm x 10cm, with depth of 5cm, filled with water together with a small quantity of washing up liquid to reduce surface tension.

Visits to the site by one of us (MJS) on 12.viii.2009 and 13.viii.2009 failed to find any evidence of the species despite exhaustive searches. The nearest previously recorded site for the species is almost exactly 100km away on the Isle of Man. In the absence of further records from Cumbria it must be suspected that the specimen was wind-blown from the Isle of Man.

The specimen will be deposited in the World Museum, Liverpool.

Fig. 2. General view of *M. cowini* capture site photographed August 2009 with part of boardwalk visible at upper right (specimen captured late July 2006).

Acknowledgements

Our particular thanks go to Lee Miles of Middlemarch Environmental who carried out the original trapping work for the survey of Foulshaw Moss and collected the sample containing the *M. cowini* specimen (we have unfortunately been unable to contact him during preparation of this paper). We also thank John Dunbavin, Reserves Officer of Cumbria Wildlife Trust for his co-operation in the preparation of the paper and for showing MJS around the site where the specimen was captured.

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Crossopalpus curvinervis (Zetterstedt) (Diptera, Hybotidae) new to Britain from north Kent - On 9 September 2012 I swept a male *Crossopalpus curvinervis* (Zetterstedt, 1842) from a dry bank, bordering saltmarsh, at Oare Marshes near Faversham (TR011647), East Kent (V.C. 15). The specimen had palpi with yellow ground colour, the thoracic pleura partly dusted, and lacked strong anterodorsal setae on the hind tibia. It was provisionally named using the key by M. Chvála (1975. The Tachydromiinae (Dipt. Empididae) of Fennoscandia and Denmark. *Fauna Entomologica Scandinavica* **3,** 1-336). This identification was kindly confirmed by Adrian Plant - **LAURENCE CLEMONS,** 14, St. John's Avenue, Sittingbourne, Kent ME10 4NE

Dipterists Digest 2012 **19,** 155-156

Tipula (*Pterelachisus*) *mutila* Wahlgren (Diptera, Tipulidae) new to France and its status in Britain

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Summary
Tipula mutila Wahlgren, 1805 is recorded as new to France. The provenance of British records and its likely present status in Britain are discussed

While identifying tipuloid specimens from the Réserve Naturelle du Marais de Lavours (Dept. Ain, France), collected by Phil Withers, a male and female *Tipula mutila* Wahlgren, 1805 were identified, which had been caught in the nature reserve by an aerial interception (or window) trap, operated for beetles. The identification was confirmed by P. Oosterbroek and J. Salmela. The details of the record are as follows: France, Ain, Béon, UTM 713/714.5080. Marais de Lavours, 21-28.iv.2011, coll. P. Withers.

The Marais de Lavours lies at the junction of the River Rhône and a smaller tributary, the River Seran at N45 49.98 E5 44.80, some 70km east of Lyon, near the village of Culoz and just north of the Lac du Bourget. It has a widely fluctuating water table, and in late winter / early spring is frequently inundated. As a consequence, fallen dead wood (much of it birch *Betula* and alder *Alnus*) is under water in the early part of most years. The species *Erioptera fossarum* Loew was also found there, for the first time in France (Kramer 2007)

The habitat of *T. mutila* is given by Salmela (2009) as moist heath forest, and is said to have been reared from a decaying aspen trunk and, although the evidence is only circumstantial, it is possible that it is also associated with decaying birch logs (J. Salmela *pers. comm.*). Populations of *T. mutila* extend throughout the Palaearctic, from southern England to the Kuril Islands (for details see Oosterbroek 2012). In spite of its large range, *T. mutila* is a rarely recorded species, as indicated by the fact that this record from France is only the third record for this century, the other two being from the Moscow region (Pilipenko 2002) and from Finland, where it is said to be widespread but local (Salmela 2009). This French record is also noteworthy since it is some eight hundred kilometres to the south of the nearest previously known locality in western Europe, near Hamburg in Germany (Riedel 1913).

In Britain *Tipula mutila* is possibly extinct. There are just two British specimens known with their records on the BRC database (www.searchnbn.net) and both are from the south of England. The first one, a male, was collected by F.C. Adams from his garden in Lyndhurst, New Forest, Hampshire, on 28 May 1896, and the voucher specimen is in the collection of the Natural History Museum, London. The second specimen is a female, from the collection of Dr F.H. Haines, and also now in the collection of the Natural History Museum, London (Edwards 1933). Edwards wrote that the specimen had been taken at Chickerell, near Weymouth and provisionally determined as *T. hortensis* Meigen. The specimen is labelled 'Dorset, Chickerell, F.H. Haines, 1932'. However, for me, some mystery still remains as to the origin of this specimen. There is no *T. hortensis* listed in Haines' paper on the Craneflies of Dorset and the New Forest. There is, however, '*T. hortulana* Mg ? Chickerell'. In this paper Haines (1926) states ' .... *Chickerell, Portland and adjacent coast*

records are generally from specimens in a collection made by the late N.M. Richardson, and now in the Dorset County Museum.' Most of the specimens in the Richardson collection date from around 1890, about the same time as the Adams specimen. There is also a handwritten label in the Richardson collection which says: *'T. hortulana* Mg ?' - a provisional identification. Both *T. hortensis* Meigen and *T. hortulana* Meigen are on Verrall's 1901 British checklist. The name *T. hortensis* was used for specimens of *T. submarmorata* Schummel, while *T. hortulana* was used for both *T. pseudovariipennis* Czizek, and *T. submarmorata*. Edwards had certainly used *hortulana* as a name for *T. pseudovariipennis* Czizek.

In any case, no further specimens of *T. mutila* from Britain have been found for at least 80 and perhaps for over 100 years.

Tipula mutila emerges early and it is possible that many British sites with the right moist heath forest habitat, such as Chartley and Whixall Mosses, have not been searched at the time of emergence. It may also occur in Scotland in birch/aspen heath woodland.

Acknowledgements

Thanks to Phil Withers for supplying the specimens, and for habitat details, and also to Pjotr Oosterbroek and Jukka Salmela for confirming my identification, and for advice on the text.

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Dipterists Digest 2012 **19**, 157-160

Records of the pupal morphotype *Macropelopia* spec. Norwegen, *sensu* Fittkau 1962 (Diptera, Chironomidae), from Ireland and Iceland

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Summary

The chironomid pupal morphotype *Macropelopia* spec. Norwegen, sensu Fittkau (1962), is recorded as new for Ireland, the British Isles and Iceland.

Introduction

Fourteen species of *Macropelopia* Thienemann, 1916 (Chironomidae: Tanypodinae) are recognised worldwide, ten of which have a Palaearctic distribution with six of these known from the western Palaearctic Region (Ashe and O'Connor 2009). Two species groups are recognised in *Macropelopia* based on pupal morphology – the *M. notata* group and the *M. nebulosa* group (Fittkau 1962) and evidence for the occurrence of additional undescribed West Palaearctic *Macropelopia* species is provided by some records of pupal morphotypes which are not associated with currently known adults. Three species are on record in the British Isles (Chandler 1998, Chandler *et al.* 2008), of which *M. notata* (Meigen, 1818) and *M. adaucta* Kieffer in Kieffer & Thienemann, 1916, belong to the *notata* group and *M. nebulosa* (Meigen, 1804) to the *nebulosa* group. Langton (1991) recognised an additional species-level taxon, described as *Macropelopia* Pe1 (*M. notata* group), from Loch Venacher, Scotland. This taxon was only known from Scotland until Murray (2010) reported a second record for the British Isles from L. Caum, Co Kerry, south-west Ireland.

Another West Palaearctic pupal morphotype is known from Norway and Alpine Italy. Fittkau (1962) described exuviae of "*Macropelopia* spec. Norwegen" (*M. nebulosa* group), from a specimen collected by Lars Brundin in the subarctic Lake Juvvatn, Norway. That was the sole example until Lencioni and Marziali (2005) reported contemporaneous collection of unassociated pupal exuviae of *M.* spec Norwegen while describing the new species *M. rossaroi* Lencioni & Marziali, from high altitude Alpine glacial ponds in the Stelvio National Park, Trentino, Italy. The authors speculated that exuviae of *M.* spec. Norwegen, although not directly linked with the adult, could most likely be associated with *M. rossaroi* and also noted an earlier unpublished record of *M.* spec. Norwegen, by Professor B. Rossaro, from a glacial pool in Val de Genova, Italy in September 1990.

This paper documents records of *M.* spec. Norwegen in Ireland and Iceland. General morphological terminology follows Sæther (1980) and Langton and Visser (2003).

New records of *Macropelopia* spec. Norwegen (? = *M. rossaroi* Lencioni & Marziali 2005)

In the course of routine examination of collections of pupal exuviae from lakes in Ireland for CPET analyses (Wilson and Ruse 2005) on behalf of the Environmental Protection Agency, three *Macropelopia* morphotypes were observed in a sample from L. Keagh, a small lake (surface area 8 ha) in County Clare, along the Irish western seaboard. Two were readily

identified as *M. adaucta* and *M. nebulosa*. The third type clearly belonged to the *nebulosa* group from its possession of 6 LS taeniae on abdominal segment VII, but the relatively smaller plastron plate of the thoracic horn compared to *M. nebulosa* allowed identification as *Macropelopia* spec. Norwegen from Fittkau (1962) and Langton and Visser (2003), which is here cited as a new record for Ireland and the British Isles.

A second new western Palaearctic record derives from collections in Iceland. During an International Workshop on the *Lake Mývatn Ecosystem Studies Programme*, at Skutústadir, Iceland in July 1999, participants had the opportunity to collect in different locations in the region. A collection of pupal exuviae from a small coastal stream above its inflow to the Arctic Ocean at Skjálfandi Bay, between Husavik and Hallbjarnarstaður in northern Iceland, yielded exuviae of *M.* spec Norwegen and *M. nebulosa*. *Macropelopia nebulosa* is already known from Iceland (Hraffinsdottir 2005) but this is the first record of *M.* spec Norwegen from this Arctic Island. A map depicting known distribution is presented (Fig. 1).

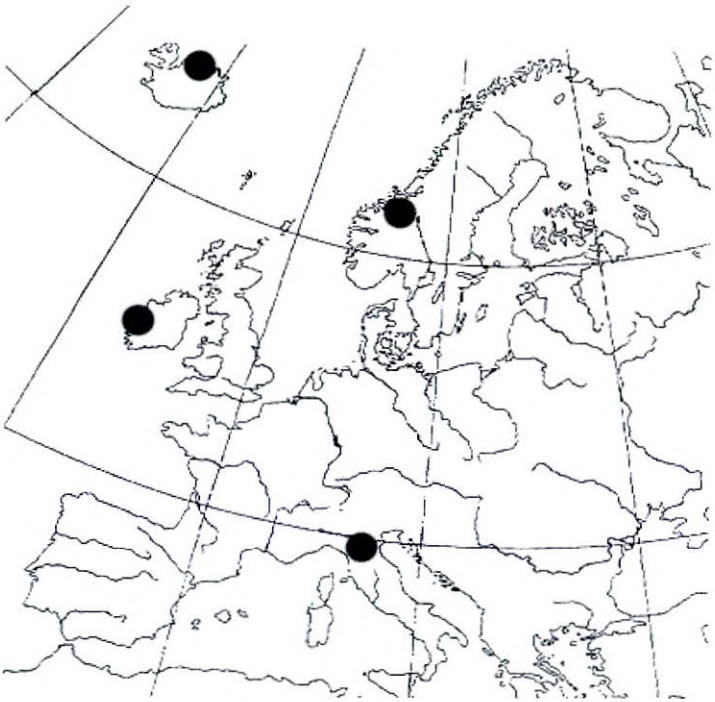

Fig. 1. Known distribution of *Macropelopia* spec. Norwegen.

Collection and site details for new records of *Macropelopia* spec Norwegen (? = *M. rossaroi*)

IRELAND: Co Clare, Lough Keagh along north-west shore, near Slievenalicka, Milltown Malbay, Latitude 52.875°N, Longitude 9.335°W, Irish Grid Reference R100813, UTM 29U47, Pe, 15.ix.2009, leg. R. Little, EPA.
ICELAND: Barmur, north of Húsavík, unnamed stream. 1.0 metre wide, 10-20cm deep, 50 metres distant from Arctic Ocean (opposite Lundey Island), Latitude 66.113° N, Longitude 17.269°W, UTM 29MU77. Pe, 5.vii.1999, leg. D. Murray.

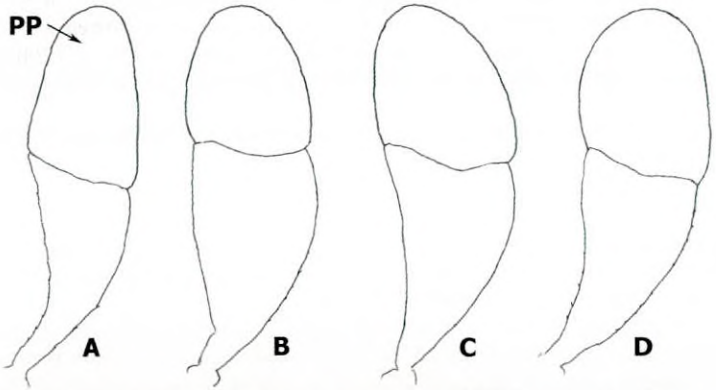

Fig. 2. ***Macropelopia*** **species, outlines of pupal thoracic horns. A.** ***M. nebulosa*****; B – D.** ***M.*** **spec. Norwegen: B - from Italy (redrawn from Lencioni and Marziali, 2005), C - from Ireland, D - from Iceland (pp = plastron plate).**

Addendum to descriptions of *M.* spec Norwegen

Langton and Visser (2003) provided descriptions of *M. nebulosa* and *M.* spec. Norwegen, the latter based largely on Fittkau (1962). While the two taxa share many common features, observations on the new material of *M.* spec. Norwegen, from Ireland and Iceland, shows that a posterior band of larger teeth is also present on tergites II to V in both taxa (a character cited as present in *M. nebulosa* but not for *M.* spec Norwegen in Langton and Visser *op. cit.*). The ratio of the length of the plastron plate to the total length of the thoracic horn is the prime discriminatory feature for separation of pupae of *M. nebulosa* from *M.* spec. Norwegen (Fittkau 1962, Langton and Visser 2003, Lencioni and Marziali 2005). The plastron plate (PP) in *M. nebulosa* is approximately half of the total horn length (Fig. 2A) while in *M.* spec. Norwegen the plastron plate is obviously less than half, occupying approximately one third of the overall horn length (Figs 2B, C, D).

Acknowledgements

I am grateful to Dr Ruth Little, Environmental Protection Agency, who collected pupal exuviae from L. Keagh and to the Agency's Senior Research Officer, Dr Deirdre Tierney, for permission to publish data derived from analyses of CPET samples. I thank Professor Gísli Gislason, Dr Arni Eínarsson and Dr. Jón Ólafsson, Institute of Biology, University of Iceland for facilitating fieldwork and for hospitality extended in Iceland.

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Changes to the Irish Diptera List (18) – Editor

This section appears as necessary to keep up to date the initial update of the Irish list in Vol. **10,** 135-146 and the recent checklist of Irish Diptera (Chandler *et al.* 2008). Species are listed under families, but with references listed separately (unless within the present issue). The additions cited below bring the total Irish list to **3359** species.

Chironomidae

Rheotanytarsus rioensis Langton & Armitage, 1995 (added by Murray and O'Connor in the present issue)

Tanytarsus miriforceps (Kieffer, 1921) (added by Langton in present issue)

Tanytarsus verralli Goetghebuer, 1928 (omitted in error from Chandler *et al.* 2008; Irish records discussed by Langton in the present issue)

Smittia amoena Caspers, 1988 (added by Langton in present issue)

Macropelopia spec. Norwegen, *sensu* Fittkau 1962 ++ (added by Murray in the present issue)

Muscidae

Phaonia magnicornis (Zetterstedt, 1845) (added by Langton in present issue)

Rheotanytarsus rioensis Langton & Armitage (Diptera, Chironomidae) new to Ireland from specimens collected in 1973-5

- While reviewing previously unidentified slide-mounted specimens in the course of compiling an updated checklist and account of the distribution of Chironomidae in Ireland, the senior author came across two specimens amongst his set of miscellaneous slide preparations, that were undetermined adult males of a species of *Rheotanytarsus* Thienemann & Bause, 1913. Both specimens had been collected in Co. Kerry during the 1970s and had been marked "*Rheotanytarsus* sp. indet." since positive identification was not possible from keys available at that time. The genus belongs to tribe Tanytarsini of the subfamily Chironominae.

Following recent examination, these specimens have been identified from P.H. Langton and L.C.V. Pinder (2007. Keys to the adult male Chironomidae of Britain and Ireland. *Freshwater Biological Association Scientific Publication* **No. 64**. Volumes 1 and 2) as *Rheotanytarsus rioensis* Langton & Armitage, 1995. Although the records from south-west Ireland date from more than 37 years ago, it is appropriate to document the occurrence of this species as an addition to the Irish faunal listing.

Both records derive from collections made in Co. Kerry in separate, but adjoining, river catchments in Hydrometric Area 22 of the south-western river basin district. Site and collection details for the two records are as follows:

1) River Flesk, Killarney, IGR V973895, 25.viii.1973, adult ♂, leg. JPOC, slide prepared and recently determined by DAM. The collection site lies about 800 metres upstream of New Bridge, the lowermost bridge across the River Flesk on the Killarney to Kenmare road.

2) River Caragh at Blackstone Bridge, approximately 1.5km upstream of Lough Caragh, IGR V709864, 4.viii.1975, adult ♂, leg. JPOC, slide prepared by C. Dowling and recently determined by DAM. Collections were made at this site during a baseline study of the macroinvertebrate fauna of the River Caragh (Dowling, C., O'Connor, J.P. and O'Grady, M.F. 1981. A baseline study of the Caragh, an unpolluted river in south-west Ireland: observations on the macroinvertebrates. *Journal of Life Sciences, Royal Dublin Society* **2,** 147-159), when Blackstone Bridge was designated as Site number 5 of that survey.

Rheotanytarsus rioensis had not been described when the specimens were collected in Ireland, since it was not recognised as a discrete species until some 23 years later when it was described from specimens collected by P.D. Armitage in an irrigation conduit on Tenerife, Canary Isles (Langton, P.H. and Armitage, P.D. 1995. *Rheotanytarsus rioensis* (Diptera: Chironomidae) a new species of the *pentapoda* group from the Canary Islands. *British Journal of Entomology and Natural History* **8,** 11-17). It was only known from the type locality on the Canary Islands until it was found in Cumbria, England in 2002 and in Gwynedd, Wales in 2003 (Langton, P.H. and Ruse, L.P. 2006. Further species of Chironomidae (Diptera) new to the British Isles and data for species newly recorded in the 1998 Checklist. *Dipterists Digest* (*Second Series*) **12**(2005), 135-140). The records reported from Ireland in this paper pre-date those records from Great Britain and represent earlier, 20th century, findings of the species from the British Isles - **DECLAN A. MURRAY,** Freshwater Biodiversity, Ecology and Fisheries Research Group, School of Biology and Environmental Science, University College Dublin, Belfield, Dublin 4, Ireland, declan.murray@ucd.ie **and JAMES P. O'CONNOR,** Emeritus Entomologist, National Museum of Ireland, Kildare Street, Dublin 2, Ireland

Sargus bipunctatus (Scopoli) (Diptera, Stratiomyidae) on carrion in Nottinghamshire, and some considerations for forensic entomology - On 7 October 2009 numerous females of *Sargus bipunctatus* (Scopoli, 1763) were recovered from pig carrion (*Sus scrofa domesticus*), which had lain in woodland upon the Clifton Campus of the Nottingham Trent University (SK547353) for twenty-four days. By 28 October 2009 larvae were observed feeding upon the mixture of soil, leaf litter and organic decomposition leachates surrounding the carrion.

The presence of *S. bipunctatus* upon carrion is noteworthy for a number of reasons: firstly, while K.G.V. Smith (1986. *A manual of forensic entomology*. Trustees of the British Museum (Natural History), London) noted the presence of the genus *Sargus* on dog carrion in the U.S.A., little consideration is given to individual species, or indeed species from the British Isles. J. Dear (1979. Carrion. pp 79-82. **In** Stubbs, A. and Chandler, P. (Eds) *A Dipterists Handbook* (1st edition). The Amateur Entomologist Vol. 15. Amateur Entomologists' Society, Hanworth, Middlesex) did not report that *Sargus* is present on carrion, even when accounting for autumnal species. A.E. Stubbs and M. Drake (2001. *British Soldierflies and their allies*. 512 pp. British Entomological and Natural History Society, Reading) stated that *S. bipunctatus* is the only British soldierfly to be found in autumn, and is indeed most abundant in September, although the flight period is July to November.

The family Stratiomyidae is considered somewhat unusual among Lower Brachycera in that its larvae are neither parasitoids nor predators (Oosterbroek, P. 2006. *The European families of the Diptera: Identification, diagnosis, biology*. 208 pp. KNNV Publishing Utrecht.). Although M.R. Shaw and L. Sivell (2011. An unusual rearing of *Chloromyia formosa* (Scopoli) (Diptera, Stratiomyidae). *Dipterists Digest (Second Series)* **18,** 3-4) found that the soldierfly *Chloromyia formosa* appeared to have developed on the pupa of the butterfly *Hamearis lucina* (Linnaeus), they suggested that *C. formosa* is an opportunistic predator due to the lethargic movements of terrestrial soldierfly larvae.

The larvae of *Sargus* are reported to be terrestrial and have been recorded as mainly developing in cow dung, but would also appear to be opportunists, which will feed as larvae in a wide variety of decomposing organic matter, including rotting bracket fungi and compost heaps (Stubbs and Drake *op. cit.*). P. Skidmore (1991. *Insects of the British cow-dung community*. 166 pp. Field Studies Council occasional publications 21) noted that *S. bipunctatus* is a common pasture species.

Given the abundance of *S. bipunctatus* on the carrion, its late appearance in the year and the lack of information regarding it in the forensic literature, it would seem that *S. bipunctatus* is an overlooked species that occupies a specific niche in the carrion community. As noted by J. Manlove (2010. Forensic Entomology. pp 179-183. **In** Chandler, P.J. (Ed) *A Dipterists Handbook* (2nd Edition). The Amateur Entomologist Volume 15. Amateur Entomologists' Society, Orpington, Kent), knowledge of the ecology of carrion feeding insects can be used in legal cases to determine the time since death, among other things, in a suspicious death case. The presence of *S. bipunctatus* larvae on a corpse is highly indicative of it being dead in the autumn months; it is not likely that *S. bipunctatus* would be present on a corpse found in March for example - **ANDREW I.R. CHICK,** School of Science and Technology, Nottingham Trent University, Clifton Lane, Nottingham NG11 8NS

Dipterists Digest 2012 **19**, 163-167

A new species of the genus *Sciapus* Zeller from the Primorje (Diptera, Dolichopodidae)

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Summary
A new species *Sciapus dytei* sp. n., close to *S. bellus* (Loew, 1873), is described from the Russian Far East.

Introduction

Bickel (1964) provided an overview of the world fauna of the subfamily Sciapodinae. To date, taking into account undescribed new species in collections, there are 63 known species of the genus *Sciapus* Zeller, 1842, of which a number of species were described only from females. The vast majority of species are known from the Palaearctic region (55 species and subspecies). Other regions are inhabited by a relatively small number of species, in the Nearctic 8 species and only 1 species in each of the Afrotropical, Neotropical, Australian and Indo-Malayan regions.

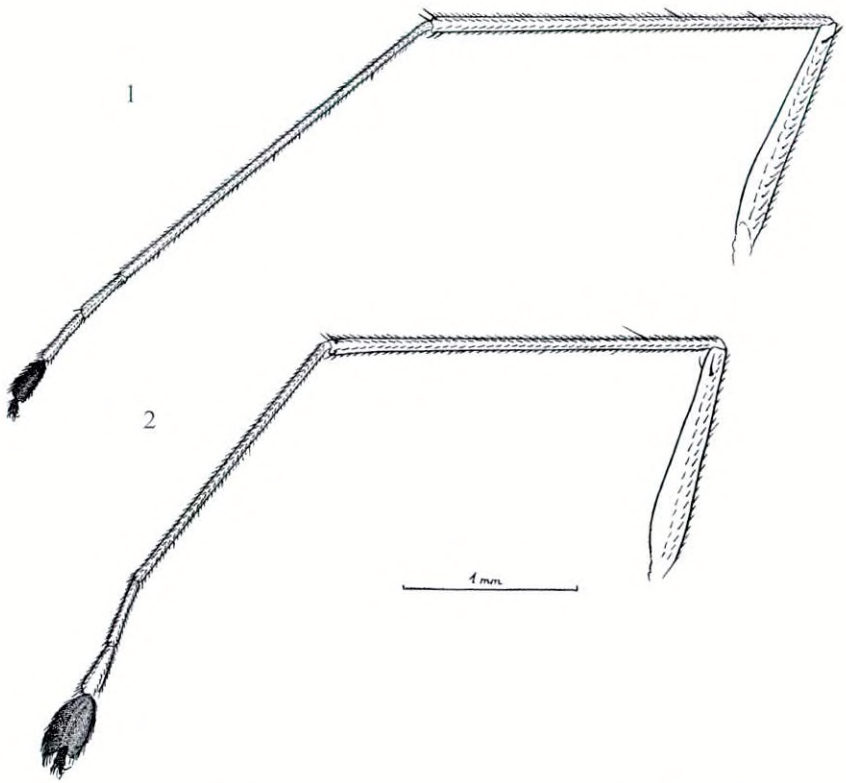
The most complete data on the Palearctic fauna of *Sciapus* is found in the monograph by Becker (1918), whose key contains 31 species of this genus. Later Parent (1938) reviewed the genus in France and also compiled a key to the Palaearctic species of this genus, comprising 36 species.

In recent years the following new species of *Sciapus* have been described: *S. auresi* Vaillant, 1952; *S. palmipes* Collin, 1966; *S. venetus* Meuffels, 1977; *S. matilei* Negrobov, 1977; *S. polozhentsevi* Negrobov, 1977; *S. paradosus paradosus* Negrobov et Shamshev, 1986; *S. paradosus sachalinensis* Negrobov & Shamshev, 1986; *S. incogitus* Negrobov & Shamshev, 1986; *S. sibiricus* Negrobov & Shamshev, 1986; *S. mediterraneus* Bulli & Negrobov, 1987; *S. basilicus* Meuffels & Grootaert, 1990; *S. medvedevi* Negrobov & Selivanova, 2009; *S. richterae* Negrobov & Grichanov, 2010 (Vaillant 1952; Collin 1966; Negrobov 1973, 1977; Meuffels 1977; Meuffels and Grootaert 1990; Negrobov and Shamshev 1986; Negrobov and Bulli 1987; Meuffels and Grootaert 1990; Negrobov and Selivanova 2009; Negrobov and Grichanov 2010).

Several type specimens from the collections of Loew and Becker in the Humboldt University in Berlin have been redescribed: *S. calceolatus* (Loew, 1859); *S. euchromus* (Loew, 1857); *S. glaucescens* (Loew, 1856); *S. gracilipes* (Loew, 1871); *S. nigricornis* (Loew, 1871); *S. opacus* (Loew, 1866); *S. adumbratus* Becker, 1902; *S. albimanus* Becker, 1918; *S. longimanus* Becker, 1907; *S. montium* Becker, 1908 (Negrobov and Maslova, 2006; Negrobov and Selivanova, 2006). A lectotype for *Sciapus bellus* (Loew, 1873) was designated in an article by Negrobov and Pont (2005).

Material and methods

The holotype and most paratypes of the new species described in this study are deposited in the collection of the Zoological Institute of the Russian Academy of Sciences, St Petersburg (ZIN). One of the paratypes is deposited in the collection of the Voronezh State University. Morphological terminology follows Robinson and Vockeroth (1981), Stuckenberg (1999), and Sinclair (2000).



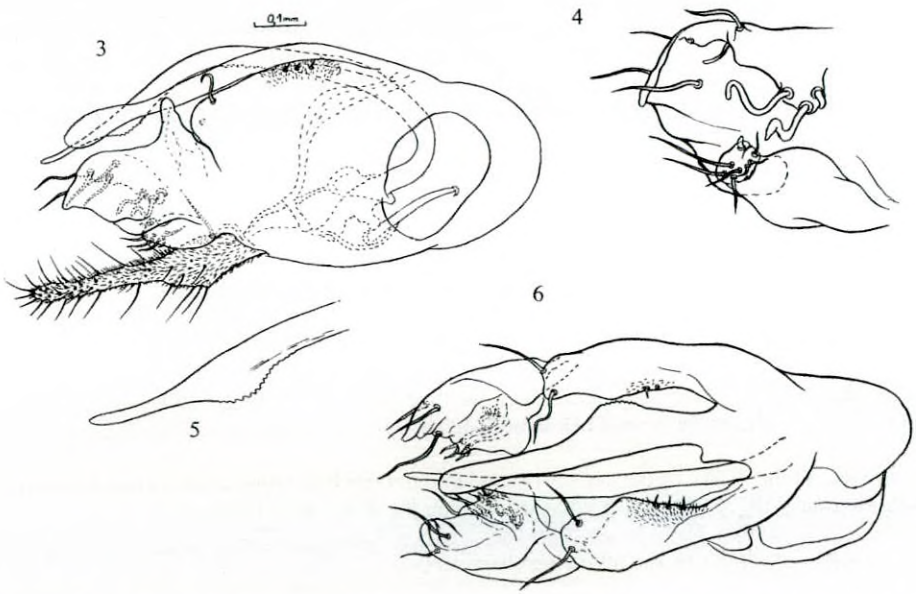
Figs 1-2. ***Sciapus*** **species, fore legs. 1,** ***S. dytei*** **Negrobov, Maslova & Selivanova sp. n. 2,** ***S, bellus*** **Kowarz, fore leg.**

Sciapus dytei **Negrobov, Maslova & Selivanova sp. n.** (Figs 1, 3-6)

Diagnosis. Face matt, white pollinose, median height below antennae approximately equal to height of postpedicel [= third antennal segment]. Fore tarsus with 4th tarsomere with a row of long black setae on each side, expanded and laterally compressed, its width approximately twice that of the third tarsomere of the same leg; 5th tarsomere of fore tarsus expanded from near base and laterally compressed. The phallus with a ventral oval-shaped process with small teeth. "Organ X", a ventral projection of the cercus, is absent.

Description. Male: body length: 5.5-5.8 mm, wing length: 4.4-4.6 mm.

Head. Frons shining metallic green, white pollinose. A long strong anterior vertical bristle, 2 long black postverticals. Face matt, white pollinose, median height below antennae approximately equal to height of postpedicel. Face and convex epistoma separated by a distinct transverse suture. Proboscis dark yellow; palpus light yellow, with white hairs. Antenna with scape and pedicel yellow, postpedicel brown, higher than long; pedicel with short setae; stylus dorsal, long, short haired. Postocular setae entirely white.



Figs 3–6. ***Sciapus dytei*** **Negrobov, Maslova & Selivanova, sp. n.** 3, **hypopygium, left lateral aspect; 4, surstylus, inner lateral aspect; 5, end of phallus, lateral aspect; 6, hypopygium, ventral aspect.**

Thorax metallic green, grey pollinose; mesonotum with black setae; six long dorsocentrals; no acrostichals; scutellum with 2 strong median setae, without fine bristles and hairs.

Legs yellow, 4th and 5th tarsal segments black. Coxae with long yellow hairs. Fore femur with antero- and posteroventral rows of long white hairs, longer than height of femur; fore tibia and fore basitarsus with very fine bristles; 4th tarsomere of fore tarsus with a row of long black setae on each side, expanded and laterally compressed, its width approximately twice that of the third tarsomere of the same leg; 5th tarsomere of fore tarsus expanded from near base and laterally compressed. Mid femur with 1 anterior and 1 posterior small preapical seta. Mid tibia with 3 anterodorsal, 3 posterodorsal and 1 ventral small setae and short apicals; tarsomeres simple, with short ventral and apical setae. Hind femur with 1 anterior preapical seta; hind tibia and basitarsus with short black setae. Fore leg length ratio (from tibia to tarsomere 5): 5.0: 6.1: 1.3: 1.6: 1.3: 0.6, mid leg: 9.8: 9.8: 1.4: 1.2: 1.2: 0.6, hind leg: 13.2: 8.1: 2.7: 2.2: 1.7: 0.6.

Wing with yellow veins, the front edge of the wing dark; costa almost straight; M_2 forms a right angle with M_1. R_{4+5} and M_1 convergent. Ratio of part of costa between R_{2+3} and R_{4+5} to that between R_{4+5} and M_1: 2.4:0.4. Crossvein m-cu straight. M_2 and CuA distinct. Anal lobe small; anal angle acute. Lower calypter with yellow cilia. Haltere yellow.

Abdomen very long, metallic green, with violet bands at tergal basal margins, metepisterna yellow, with mainly black hairs of moderate length. First tergum with long yellowish-white hairs, sterna with yellowish-white hairs. Hypopygium black. Epandrium

oblong-oval (Fig. 3), its length about 1.5 times the width; surstylus is a broad plate, with a sharp apex and odontoid process at the base of the ventral side, in the middle of the ventral side with a deep notch on the inner side with long and fine bristles (Fig. 4). The phallus dorsally with a ventral oval-shaped process with small teeth (Fig. 5). Hypandrium long asymmetrical (Fig. 6). Cerci free, oblong-oval, longer than surstylus. Cercus without ventral projection ('Organ X').

Female. Unknown.

Type material. Holotype ♂, Primorje, Ussuri Reserve, 6.vii.1984 (leg. Duchanina). Paratypes: 3 ♂♂, at the same location, 28.vi.1984, 6.vii.1984 (leg. Duchanina).

Distribution. Russia, Primorje.

Etymology. The species is named after the late Peter Dyte, to acknowledge his many contributions to the study of world Dolichopodidae.

Remarks. In the works of Becker (1918) and Parent (1938) the species runs close to *Sciapus bellus* Kowarz, 1873, with which it has in common the absence of 'Organ X'.

It differs from *S. bellus* by the following characters:

- Fore tibia shorter than the basitarsus of the same leg (Fig. 1). Front edge of wing dark. 4th tarsomere of fore leg is about twice as wide as 2nd tarsomere of the same leg. 3rd tarsomere of the fore tarsus not expanded apically ..... *Sciapus dytei* sp. n.
- Fore tibia longer than basitarsus of the same leg (Fig. 2). Wing transparent. 4th tarsomere of fore leg about 5 times as wide as 2nd tarsomere of the same leg. 3rd tarsomere of the fore leg expanded apically ..... *Sciapus bellus* Kowarz

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***Platypalpus nigricoxa* Mik (Diptera, Hybotidae) new to Britain** – Amongst Hybotidae collected in the Wye Valley in 2012 was a single female of *Platypalpus nigricoxa* Mik, 1884, which is the first record of this species from Great Britain. The specimen was swept from woodland at the top of the east slope of the Wye Valley at Devil's Pulpit (ST543995, West Gloucester, V.C. 34) on 13.vi.2012. Extensive searching at the same site and a nearby long-disused limestone quarry (Ash Grove Quarry, ST562994) on 20.vi.2012 failed to capture any more specimens. The locality is ancient *Fagus* / *Fraxinus* / *Tilia* woodland on Carboniferous limestone epikarst. A rich fauna of Empidoidea was present including ancient woodland species such as *P. macula* (Zetterstedt, 1842) and *P. mikii* (Becker, 1890), calcareous specialists including *P. incertus* (Collin, 1926) and *Empis laetabilis* Collin, 1926, and damp shaded soil conditions are attested for example by the presence of *Oropezella sphenoptera* (Loew, 1873), *Trichopeza longicornis* (Meigen, 1822) and *Chelipoda vocatoria* (Fallén, 1816).

Platypalpus nigricoxa has a disjunct distribution in central Europe and the extreme north of Scandinavia and European Russia (Chvála, M. 1989. Monograph of the northern and central European species of *Platypalpus* (Diptera, Hybotidae), with data on the occurrence in Czechoslovakia. *Acta Universitatis Carolinae Biologica* **32,** 209–376) and may be a boreoalpine element (Chvála, M. 1975. The Tachydromiinae (Dipt. Empididae) of Fennoscandia and Denmark. *Fauna Entomologica Scandinavica* **3,** 1–336, Scandinavian Press, Klampenborg). Its occurrence in southern Britain is perhaps remarkable.

It may be readily identified from the keys, descriptions and figures in Chvála (1975, *op. cit*). It is also keyed by P. Grootaert and M. Chvála (1992. Monograph of the genus *Platypalpus* (Diptera: Empidoidea, Hybotidae) of the Mediterranean region and the Canary Islands. *Acta Universitatis Carolinae Biologica* **36,** 3–226). Further descriptive and distribution information is in Chvála (1989, *op. cit.*)

Platypalpus nigricoxa belongs in the *P. longicornis*-group (*sensu* Chvála 1993, *op. cit.*), having two pairs of vertical setae, a well developed postpronotal lobe (humerus) bearing a distinct seta and mid femur lacking posteroventral bristles behind the double row of ventral spine-like bristles. In Britain *P. nigricoxa* is most likely to be confused with *P. incertus* (Collin, 1926) or *P. pulicarius* (Meigen, 1830), but both these species have the basal antennal segments yellowish and 4-serial acrostichal setae whereas in *P. nigricoxa* the basal antennal segments are as dark as the postpedicel (third segment) and the acrostichals are distinctly and irregularly 6-serial. In *P. nigricoxa* the legs are dark yellow with darker tarsi and black coxae and trochanters, and the anterior four femora have characteristic narrow blackish stripes on the basal half ventrally (note that couplet 81 in Chvála 1975, *op. cit.*, which states '*posterior* femora with a narrow black stripe beneath' appears to be an error which was corrected in Chvála (1989, *op. cit.*) p. 281 and in Grootaert and Chvála (1992, *op. cit.*) couplet 208).

Although there are several similar species in continental Europe, only *P. vegrandis* Frey, 1943, which occurs widely from France and Belgium across much of Europe, seems likely as a potential future addition to the British list. The Mediterranean *P. maltensis* Chvála and central European *P. alpigenus* (Strobl) are similar but have 3-4 or 4-serial acrostichals and *P. lesinensis* (Strobl) from the Balkans has 8-serial acrostichals; these species are unlikely to be confused with *P. nigricoxa*. The following key includes both *P. nigricoxa* and *P. vegrandis*. The key applies only to species of *Platypalpus* with a black thorax, two pairs of verticals and a dusted scutum and is a modification of Key I provided by A. Plant (2012. A key to the British species of *Platypalpus* Macq. (Hybotidae). Empidid & Dolichopodid Recording Scheme Newsletter No 17, Spring 2012. *Bulletin of the Dipterists Forum* **73,** 12

pp). The reference in the latter key to *P. brachystylus* (Bezzi, 1892) having been found in Britain was apparently in error (Jon Cole and Milan Chvála *pers. comm.*).

Key to British species of *Platypalpus* with black thorax, two pairs of vertical setae, scutum entirely dusted (if only thinly)

1 T2 without apical spur (or spur very small); antenna with basal segments often yellowish **2**
- T2 with long sharply pointed apical spur; antenna with basal segments blackish **9**

2 Acrostichals 2-serial; F2 equal to or less than width of F1 ..... **3**
- Acrostichals 3-4-serial or more; F2 wider than F1..... **6**

3 Antenna with postpedicel very short, hardly longer than deep; small species 1.2-1.8 mm ..... ***nanus*** **(Oldenberg, 1924) [not British]**
- Antenna with postpedicel longer, 3x or more as long as wide **4**

4 Antenna very long, postpedicel 5x or more as long as deep, stylus c. 0.25x as long; legs dark yellow, tibiae brownish, tarsi almost black ..... ***brachystylus*** **(Bezzi, 1892) [not British]**
- Antenna shorter; postpedicel at most 4x long as deep; legs yellow, tarsi darker apically **5**

5 Antenna with postpedicel c. 4x long as deep, stylus c. half as long ..... ***luteicornis*** **(Meigen, 1838)**
- Antenna with postpedicel c. 3x long as deep, stylus about as long ..... ***tuomikoskii*** **(Chvála, 1972)**

6 Basal segments of antenna black; F1 and F2 with narrow black line on basal half ventrally; acrostichals 6-serial ..... ***nigricoxa*** **Mik, 1884**
- Basal segments of antenna yellowish; F1 and F2 without narrow black line on basal half ventrally; acrostichals 4-serial or irregularly 2-4 serial **7**

7 Legs yellow but tarsal segments 4 and 5 faintly brownish; T2 with small apical spur ..... ***pulicarius*** **(Meigen, 1830)**
- At least C2 and C3 darkened at base; tibial spur hardly present on T2 ..... **8**

8 C2 and C3 strongly darkened; antenna with stylus 2x as long as postpedicel ..... ***incertus*** **(Collin, 1926)**
- C2 and C3 less strongly darkened; antenna with stylus 1.5x as long as postpedicel ..... ***vegrandis*** **Frey, 1943 [not British]**

9 Acrostichals 4-6-serial (at least anteriorly), on broad median stripe **10**
- Acrostichals 2-serial throughout **13**

10 Larger thoracic setae yellow; legs extensively yellow including mid and hind coxae ..... ***maculipes*** **(Meigen, 1822)**

- Larger thoracic setae black; at least C2, C3, F2 and F3 extensively darkened **11**

11 T2 with apical spur rather short (at most as long as limb is deep); legs darker with paler parts brownish rather than yellow, F1 black on at least basal half; small species (1.5-1.8 mm) ..... ***celer*** **(Meigen, 1822) sensu Wéber, 1975 [not British]**
- T2 with apical spur sharply pointed, long (obviously longer than limb is deep); legs with contrasting yellow and black markings; larger (1.7-2.6 mm) **12**

12 Acrostichals 4-serial; C1 yellow; C2, C3, most of F2 and F3 on distal half black ..... ***rapidus*** **(Meigen, 1822)**
- Acrostichals irregularly 6-serial; legs more extensively black, F1 with only tip yellow and F3 almost entirely black ..... ***rapidoides*** **Chvála, 1975**

13 Large thoracic setae brownish ..... ***bilobatus*** **Wéber, 1972** (♀)
- Large thoracic bristles black **14**

14 Thoracic pleura subshining, katepisternum and anepimeron polished black; small (2 mm) ..... ***pygmaeus*** **(Meigen, 1838)**
- Thoracic pleura dusted except polished katepisternum **15**

15 Postpronotal lobe [humerus] more or less shining on outer face. Legs yellow (♂) or extensively darkened (♀); antenna with postpedicel 1.5x long as deep, stylus 1.5x as long; larger (2.4-3.6 mm) ..... ***agilis*** **(Meigen, 1822)**
- Postpronotal lobe [humerus] dusted; relative proportions of postpedicel and stylus otherwise; smaller (2-3 mm) **16**

16 Antenna with postpedicel 2.5x long as deep, stylus about same length; acrostichals pale; larger thoracic setae blackish (♂) or brownish (♀); femora extensively darkened with paler tip (♂) but F2 and F3 blackish only apically in ♀ ..... ***bilobatus*** **Wéber, 1972**
- Antenna with postpedicel 1.5x long as deep, stylus c. 2x as long or more; acrostichals black; larger thoracic setae always black; legs yellow in both sexes with dark dorsal strip on F2 and distal half of F3 black ..... ***pseudorapidus*** **Kovalev, 1971 [not British]**

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Records of Conopidae (Diptera) from the North Aegean islands of Chios and Lesvos, Greece

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Summary

Records of 24 species of Conopidae from the Greek islands of Chios (12 species) and Lesvos (20 species) are presented. Flower visits are also reported for 17 of the recorded species. *Thecophora longirostris* Lyneborg, 1962 and *T. bimaculata* (Preyssler, 1791) are reported from Greece for the first time.

Introduction

Knowledge concerning the conopid fauna of Greece is poor. The most up-to-date faunistic survey is that by Stuke and Standfuss (2007) who reported 30 species from Thessalia, in the eastern-central mainland of Greece. Other records in the literature are often historical and fragmentary in nature. In total there are about 50 species of Conopidae recorded from Greece to date.

The islands of Chios and Lesvos have been found to be very rich in insect species, such as bees (Potts *et al.* 2006, Nielsen *et al.* 2011), hoverflies (Ståhls *et al.* 2009, Petanidou *et al.* 2011) and other pollinator species (Petanidou, unpublished data). The observed species diversity is probably related to high habitat diversity, especially on Lesvos, which is particularly impressive considering it is an island. The observed diversity is even more interesting because it encompasses anatolian elements due to the geographical location of the islands. Situated in the north-east of the Aegean Sea, and being close to Turkey, Lesvos and Chios can be expected to support additional species of Conopidae occurring in the Turkish mainland but which have so far not been reported from Europe (e.g. Stuke *et al.* 2008). For this reason we believe that the study of the conopids of Lesvos and Chios is of considerable relevance to the investigation of the European conopid fauna. Whilst being based on only a relatively small collection of conopids, given that several additional species can be expected to occur on Lesvos and Chios, we believe that this paper represents an important step towards a better understanding of the distribution of conopids on the European continent. The present study also presents observations on the flowers visited by different species of Conopidae, which appear to be the first such records from the eastern Mediterranean area.

Material and methods

The study material comprised a total of 262 specimens. All of these were collected by hand-netting on the islands of Chios and Lesvos during the years 1996 to 2010. Most of the material from Lesvos was collected within the framework of the ALARM project (Settele *et al.* 2005). Where no other information is given to the contrary, the determination of species is

in accordance with Chvála (1961, 1965), Kröber (1915), Stuke (2002, 2006), Mei and Stuke (2008) and Stuke and Clements (2008). Identified specimens have been deposited in the Melissotheque of the Aegean at the University of the Aegean, Mytilene, Greece (Melissotheque), in the private collections of D.K. Clements and J-H. Stuke, while most specimens collected by M.J. Taylor are now in the World Museum Liverpool collection. Plant names and identification follow Tutin *et al.* (1964-1980) and in a few cases Bazos (2005). The following abbreviations are used for collectors: AG A. Grace, AKa A. Kamtsa, Aky A. Kyriakopoulos, CP C. Petsikos, CZ C. Zografou, De Dessomme, EL E. Lamborn, HD H. Dahm, MA M. Apostolopoulos, MG M. Greenwell, MH M. Hull, MJS M.J. Smart, MJT M.J. Taylor, MK M. Kapsali, OM O. Messinger, TP T. Petanidou.

Results

Twenty-four different taxa are recorded, 12 species from Chios and 20 species from Lesvos.

Brachyceraea brevicornis (Loew, 1847)

Chios: 1♂ Aghia Markella [38°28.87'N 25°53.18'E], 1.vii.1999, MJT; 1♂ same data, 6.vii.1999, MJT; 1♂ 3♀ Nr Dotia [38°09.91'N 25°59.66'E], 7.vi.2000, MJT; 1♀ Elinta [38°23.51'N 25°59.55'E], 5.vii.1999, MJT; 1♀ Nr Fyta [38°31.75'N 26°00.46'E], 5.vii.1997, MJT; 1♂ 1♀ Fyta [38°31.67'N 26°00.33'E], 7.vii.1999, MJT; 1♂ 2♀ Kampia Beach [38°35.77'N 25°58.69'E], 28.vi.1999, MJT; 1♂ Kampia Beach [38°35.81'N 25°58.70'E], 8.vii.1999, MJT; 1♀ Kato Fana [38°12.54'N 25°55.72'E], 12.vii.1999, MJT; 1♂ Kipouris [38°30.14'N 25°59.63'E], 14.vi.1996, MJT; 2♂ Leptopoda [38°34.97'N 25°57.07'E], 8.vii.1999, MJT; 1♀ Marmaro Marsh [38°32.35'N 26°07.04'E], 27.vi.1999, MJT. **Lesvos**: 1♀ Agiassos, 55m [39°04.53'N 26°22.48'E], 4.vi.2003, MH; 1♂ 1.6km NW Parakoila [39°11.00'N 26°07.68'E], 2.v.2004, OM.

Brachyceraea brevicornis has been found previously in Greece, albeit only rarely (Kröber 1915, 1927, 1936; von Röder 1892; Stuke *et al.* 2008). Altogether these are the only European records for this species that are so far known.

Conops flavicauda (Bigot, 1880)

Chios: 1♀ Elinta [38°23.60'N 25°59.40'E], 18.ix.1998, MJT; 1♀ Giosonas [38°34.20'N 26°04.60'E], 29.viii.1997, MJT; 2♂ 1♀ Kampia Beach [38°35.83'N 25°58.75'E], 20.viii.1997, MJT; 1♀ same data, 22.viii.1997, MJT; 2♂ Kampia Beach [38°35.81'N 25°58.70'E], 8.vii.1999, MJT; 1♀ Kato Fana [38°23.33'N 26°00.46'E], 17.ix.2003, MJT; 1♂ Nr Limenas [38°27.89'N 25°57.20'E], 16.viii.1998, MJT; 1♂ Nr Limenas [38°18.50'N 25°58.30'E], 28.viii.1997, MJT; 1♂ Siderounta [38°25.90'N 25°57.50'E], 25.viii.1997, MJT.

This is another species which reaches its western distributional boundaries in Greece, and which has been recorded in Europe only from Greece and Cyprus (Janssens 1955, Stuke and Kehlmaier 2008, Stuke *et al.* 2008). On Chios it is common on *Crithmum maritimum*. Chvála and Smith (1988) cited this species as *Conops flavicaudus* to agree in gender with the generic name *Conops* but *flavicauda* was a noun in apposition when described by Bigot under the neuter generic name *Sphixosoma* Rondani, 1857, now treated as a synonym of *Conops*, and should remain unchanged in combination with another generic name.

Conops flavifrons Meigen, 1824

Chios: 1♀ Kato Fana [38°12.54'N 25°55.72'E], 12.vii.1999, MJT; 1♀ Managros [38°27.89'N 25°56.28'E], 23.vii.1997, MJT; 1♀ Skariotis [38°28.56'N 25°56.43'E], 26.vi-5.vii.2001, MJT. **Lesvos**: 1♂ 2.6km N Assomatos [39°07.30'N 26°24.02'E], 6.vii.2004, HD; 1♀ river east of Kalloni, 19.vii.2006, on *Mentha spicata*; 1♀ Komi [39°11.80'N 26°24.03'E], on *Origanum onites*, 28.vi.2005, HD; 2♀ 1.25km S Pigi [39°10.23'N 26°25.18'E], on *Coridothymus capitatus*, 1.vii.2004, EL; 2♀ same data, HD; 2♀ Mystegna [39°12.35'N 26°29.05'E], on *Eryngium creticum*, 10.vii.2009, AKa.

Conops silaceus Wiedemann, 1824

Lesvos: 1♂ Gavathas [39°16.65'N 25°58.64'E], 10.vii.2007, MH.

***Melanosoma bicolor* Meigen, 1824**
Chios: 1♂ Gridia [38°13.07′N 26°06.10′E], 16.vi.2001, MJT.

***Dalmannia aculeata* (Linnaeus, 1761)**
Lesvos: 1♀ Pigi [39°10.10′N 26°25.17′E], on *Leontodon tuberosus*, 21.iv.2005, HD; 1♀ Scopelos [39°01.80′N 26°26.50′E], on *Cistus creticus*, 26.iv.2005, MA; 1♀ same data, 23.v.2005, HD.

***Dalmannia punctata* (Fabricius, 1794)**
Lesvos: 1♂ Pigi [39°10.10′N 26°25.17′E], on *Leontodon tuberosus*, 21.iv.2005, HD.

***Myopa buccata* (Linnaeus, 1758)**
Chios: 2♂ 1♀ Aghioi Pateres [38°22.33′N 26°03.04′E], 24.iv.2002, MJT; 2♂ Amahdes [38°34.60′N 26°01.75′E], 1-10.iv.2000, MJT; 1♂ Anavatos [38°23.33′N 26°01.77′E], 21.iii.1996, MJT; 1♂ Anavatos [38°23.93′N 26°01.58′E], 5.v.2000, MJT; 1♀ Nr Armolia [38°16.85′N 26°02.97′E], 25.iv.1997, MJT; 1♀ Nr Armolia [38°16.95′N 26°02.95′E], 4.v.1998, MJT; 1♀ same data, 4.v.1999, MJT; 1♂ Chios, 18.iv.1997, MJT; 1♂ Fyta [38°31.67′N 26°00.33′E], 25.iii.2000, MJT; 1♂ Nr Gridia [38°13.07′N 26°06.05′E], 19.iv.2000, MJT; 1♂ same data, 3.v.2000, MJT; 1♀ Katarraktis [38°16.42′N 26°05.58′E], 2.iv.1999, MJT; 1♂ Katarraktis [38°16.71′N 26°05.46′E], 29.iv.2000, MJT; 1♂ same data, 13.v.2000, MJT; 2♂ Katarraktis [38°16.23′N 26°05.65′E], 21.iii.2001, MJT; 1♂ Kato Fana [38°12.46′N 25°55.62′E], 27.iii.2003, MJT; 1♀ Kipouries [38°30.51′N 25°59.61′E], 22.iii.2002, MJT; 1♂ Thimiana [38°19.50′N 26°08.45′E], 16.v.1998, MJT. **Lesvos**: 2♀ Agiassos, 647m [39°04.02′N 26°22.13′E], 25.iv.2010, MH; 1♂ 3.8km SSE Agiassos [39°03.28′N 26°23.83′E], 24.v.2004, AKy; 1♂ 1.3km WSW Loutra, [39°03.48′N 26°32.12′E], 26.iii.2004, HD; 1♂ same data, 5.iv.2005, on *Anthemis* sp., TP; 1♂ 2.85km SW Moria [39°07.30′N 26°29.52′E], 11.iv.2004, OM; 1♂ same data, on *Anthemis arvensis*, 15.iii.2005, EL; 3♂ 2.2km SE Mystegna [39°12.25′N 26°29.12′E], 23.iii.2004, HD; 1♂ 10km S Mytilene [39°00.85′N 26°35.43′E], on *Sarcopoterium spinosum*, 28.iii.2004, OM, 1♂ 3.0km W Mytilene [39°06.32′N 26°31.43′E], 22.iii.2004, HD, 1♂ same data, on *Asphodelus aestivus*, 20.iv.2004, MG; 1♂ 8.9km SSE Mytilene [39°02.27′N 26°36.22′E], 20.iii.2004, HD; 1♀ 2.2km N Pigi [39°11.95′N 26°24.95′E], on *Echium plantagineum*, 22.iii.2005, AG; 1♂ 4.6km N Plomari [39°01.28′N 26°22.47′E], on *Anthemis arvensis*, EL.

***Myopa dorsalis* Fabricius, 1794**
Lesvos: 1♀ 1.25km S Pigi [39°10.23′N 26°25.18′E], 19.v.2004, HD; 1♀ River Potamia 5km NW Skala Kalonis, 278m [39°13.83′N 26°09.82′E], 3.vi.2003, MH; 1♀ Thermi [39°10.02′N 26°30.20′E], on *Cistus creticus*, 12.v.2005, HD; 1♀ 1km N Vatera [39°01.87′N 26°11.67′E], on *Brassica nigra*, 10.v.2004, OM.

***Myopa pellucida* Robineau-Desvoidy, 1830**
Chios: 1♀ Nr Armolia [38°16.85′N 26°02.99′E], 12.iv.2000, MJT; 1♂ Nr Gridia [38°23.33′N 26°06.17′E], 8.v.1997, MJT; 1♀ Kampia [38°35.83′N 25°58.68′E], 28.iv.2000, MJT; 1♂ Katarraktis [38°16.38′N 26°05.58′E], 19.iv.1998, MJT; 1♀ Kato Fana [38°12.49′N 25°55.73′E], 18.iv.1999, MJT; 1♀ Merikunda [38°16.55′N 25°53.41′E], 2.v.2000, MJT; 1♀ Viki [38°23.33′N 26°01.17′E], 16.iv.1998, MJT. **Lesvos**: 1♀ Agiassos [39°04.66′N 26°22.20′E], 24.iv.2001, MJT; 1♂ 3.5km S Agiassos [39°03.15′N 26°22.95′E], 23.v.2004, AKy; 1♀ 2.0km SSE Agiassos [39°04.15′N 26°23.28′E], on *Smyrnium rotundifolium*, 22.v.2004, AKy; 1♀ 1.5km WSW Lisvori [39°06.15′N 26°11.98′E], 2.iv.2007, TP; 1♀ 1.0km N Mytilene [39°07.28′N 26°32.90′E], 25.iii.2004, HD; 1♀ 1km N Vatera [39°01.87′N 26°11.67′E], 12.iv.2004, on *Onobrychis caput-galli*, MG.
This is the *Myopa extricata* Collin, 1960 of previous authors – see Stuke and Clements (2008).

***Myopa picta* Panzer, 1798**
Lesvos: 1♀ Lesvos Xenia (University) Hill [39°05.02′N 26°34.27′E], 6.iv.2006, AG; 1♀ 2.2km SE Mystegna [39°12.25′N 26°29.12′E], on *Anthemis arvensis*, 25.iii.2004, OM; 1♂ 8.9km SSE Mytilene [39°02.27′N 26°36.22′E], 5.iv.2004, HD.

***Myopa stigma* Meigen, 1824**
Lesvos: 1♀ 1.3km WSW Loutra [39°03.48′N 26°32.12′E], on *Crepis commutata*, 1.v.2004, De; 1♀ 5.7km NW Madamados [39°21.32′N 26°17.87′E], 30.iv.2004, HD; 1♀ 3.0km W Mytilene [39°06.32′N 26°31.43′E], on

Crepis commutata, 3.v.2004, EL; 1♀ same data, 15.v.2004, EL; 2♂ Pigi [39°10.10'N 26°25.17'E], 21.iv.2005, HD; 1♀ 1.25km S Pigi [39°10.23'N 26°25.18'E], 11.iv.2004, HD; 2♀ Tarti [38°58.37'N 26°27.49'E], on *Taraxacum* sp., 25.iv.2005, HD; 1♀ 2.45km W Vatousa [39°13.85'N 26°01.38'E], on *Moenchia mantica*, 29.iv.2004, EL.

Stuke and Clements (2008) distinguished *Myopa arabica* Macquart, 1850 as a separate taxon from *M. stigma*. Using the characters they suggested, some of the specimens reported here could be identified as *M. arabica*. However, having seen more material from both taxa, the distinction between them, which was based on colour characters, now seems somewhat doubtful; therefore all specimens from Lesvos are here reported as *M. stigma*.

Myopa testacea (Gmelin, 1790)

Lesvos: 1♀ 4km SSE Agiassos, Alt 745m [39°03.35'N 26°23.85'E], 29.iv.2010, MH.

Physocephala lacera (Meigen, 1824)

Chios: 1♂ Aghios Ioannis [38°13.08'N 26°04.16'E], 4.vii.1999, MJT; 2♀ Agiasmata [38°35.25'N 25°56.24'E], 8.vii.1999, MJT; 1♂ Elinta [38°23.60'N 25°59.44'E], 7.ix.1998, MJT; 1♂ Karintas [38°11.74'N 25°57.20'E], 12.vii.1999, MJT; 1♂ Katarraktis [38°16.51'N 26°05.48'E], 18.ix.1998, MJT; 1♀ Katarraktis [38°16.43'N 26°05.55'E], 15.vii.1999, MJT; 1 specimen, Kato Fana [38°23.33'N 25°55.70'E], 1.viii.1997, MJT; 1♂ 1♀ Kato Fana [38°12.54'N 25°55.72'E], 12.vii.1999, MJT; 1♂ Yiosonas [38°34.20'N 26°04.60'E], 29.viii.1997, MJT.
Lesvos: 1♀ 4.25km NW Lambou Myloi [39°10.17'N 26°22.13'E], 2.vi.2004, on *Anthyllis hermanniae*, OM; 1♂ Lesvos Xenia (University) Hill [39°05.02'N 26°34.27'E], 8.x.2005, AG; 1♂ same data, 13.vii.2005, AG; 1♀ 8.9km SSE Mytilene [39°02.27'N 26°36.22'E], on *Coridothymus capitatus*, 16.vi.2006, CP; 1♀ 3.0km SE Mytilene [39°04.93'N 26°34.28'E], on *Coridothymus capitatus*, 12.vii.2006, CP; 1♀ 4.77km W Plomari [38°59.15'N 26°18.88'E], on *Vitex agnus-castus*, 18.viii.2006, CZ; 1♀ River Potamia 5km NW Skala Kallonis [39°12.67'N 26°10.00'E], 24.vi.1999, MH.

Some of the specimens here reported as *Physocephala lacera* would be identified as *P. antiqua* (Wiedemann, 1830) according to Kröber (1936). The colour characters used by Kröber can easily lead to misinterpretations, however, and are of dubious taxonomic validity. A revision of the European species of *Physocephala* is currently underway (Stuke in prep.).

Physocephala laticincta (Brullé, 1832)

Chios: 1 specimen, Nr Gridia [38°13.12'N 26°06.09'E], 16.v.1998, MJT; 1♀ Nr Gridia [38°13.08'N 26°06.09'E], 14.iv.1999, MJT; 1♀ Katarraktis [38°16.65'N 26°05.53'E], 23.vi.1999, MJT; 1♀ Leptopoda [38°33.73'N 25°56.77'E], 3.iv.2001, MJT.

Physocephala pusilla (Meigen, 1804)

Chios: 1♀ Nr Issidoros [38°27.95'N 25°59.62'E], 30.vii.1997, MJT; 1♂ Nr Issidoros [38°28.00'N 25°59.66'E], 2.vi.1998, MJT; 1♀ Managros [38°27.89'N 25°56.28'E], 1.vii.1997, MJT.

Physocephala vaginalis (Rondani, 1865)

Lesvos: 1♀ 0.9km SW Loutra [39°03.00'N 26°32.33'E], on *Coridothymus capitatus*, 2.vii.2006, CP; 1♀ 3.0km W Mytilene [39°06.32'N 26°31.43'E], 9.vii.2004, MA; 1♀ Skala Kalonis [39°12.37'N 26°13.05'E], 21.ix.2002, MH.

Physocephala vittata (Fabricius, 1794) Agg.

Chios: 1♂ Aghia Irene [38°18.64'N 25°58.45'E], 1.x.1998, MJT; 1♂ Aghia Markella [38°28.87'N 25°53.18'E], 6.vii.1999, MJT; 1♂ Nr Armolia [38°16.87'N 26°03.01'E], 17.ix.1995, MJT; 1♂ Nr Armolia [38°16.84'N 26°03.02'E], 17.ix.1995, MJT; 1♂ Nr Armolia [38°17.20'N 26°03.05'E], 30.iv.1996, MJT; 1♂ Nr Armolia [38°17.11'N 26°03.06'E], 29.iv.1999, MJT; 1 specimen, Armolia Valley [38°16.85'N 26°06.28'E], 6.v.2004, MJT; 2 specimens, Nr Dotia [38°23.33'N 25°59.60'E], 10.ix.1997, MJT; 1♂ Elata [38°17.59'N 25°58.66'E], 4.v.1996, MJT; 1♂ Elinta [38°23.76'N 26°59.54'E], 13.ix.1997, MJT; 1♂ Elinta [38°23.60'N 25°59.44'E], 7.ix.1998, MJT; 1♂ Elinta [38°23.60'N 25°59.40'E], 18.ix.1998, MJT; 1♂ Elinta [38°23.67'N 25°59.54'E], 8.v.1999, MJT; 1♂ Emporios [38°11.53'N 26°01.35'E], 22.iv.1996, MJT; 1♂ Gridia [38°13.04'N 26°06.15'E],

14.ix.1998, MJT; 1♂ Gridia [38°13.11′N 26°06.13′E], 24.ix.1998, MJT; 1♀ Gridia [38°13.07′N 26°06.05′E], 13.iv.2000, MJT; 1♂ Gridia [38°13.11′N 26°06.00′E], 28.iii.2001, MJT; 2♂ same data, 3.iv.2001, MJT; 3♂ Nr Gridia [38°16.26′N 26°05.40′E], 15.v.1996, MJT; 2♂ Nr Gridia [38°13.12′N 26°06.09′E], 16.v.1998, MJT; 2♂ Nr Gridia [38°13.03′N 26°06.12′E], 30.ix.1999, MJT; 1♂ Kalamoti [38°14.80′N 26°03.77′E], 12.v.1996, MJT; 1♂ Kampia Beach [38°35.81′N 25°58.70′E], 8.vii.1999, MJT; 2♂ Kampia Gorge [38°34.71′N 25°58.78′E], 21.v.2003, MJT; 1♀ Karintas [38°11.74′N 25°57.20′E], 12.vii.1999, MJT; 1♂ Katarraktis [38°16.42′N 26°05.59′E], 24.iv.1996, MJT; 1♂, 2♀ Katarraktis [38°16.38′N 26°05.62′E], 11.viii.1997, MJT; 1♂ Katarraktis [38°16.41′N 26°05.55′E], 6.v.1998, MJT; 1♂ Kataraktis [38°16.51′N 25°57.47′E.], 18.ix.1998, MJT; 1♂ Katarraktis [38°16.42′N 26°05.58′E], 20.iv.1999, MJT; 1♂ Katarraktis [38°16.43′N 26°05.55′E], 9.vii.1999, MJT; 1♂ same data, 15.vii.1999, MJT; 1♂, 1♀ Katarraktis [38°16.71′N 26°05.46′E], 29.iv.2000, MJT; 1♂ same data, 16.x.2001, MJT; 1♀ Katarraktis [38°16.23′N 26°05.65′E], 21.iii.2001, MJT; 1♂ Kato Fana [38°12.52′N 25°55.70′E], 3.ix.1997, MJT; 1♂ same data, 7.x.1997, MJT; 1♂ Kato Fana [38°12.50′N 25°55.72′E], 20.iv.1998, MJT; 1♀ Kato Fana [38°12.49′N 25°55.73′E], 18-25.iv.1999, MJT; 1♂ 1♀ same data, 5-14.ix.1999, MJT; 1♀ same data, 29.ix-2.x.1999, MJT; 5♂ 1♀, 1 specimen, same data, 14-20.ix.1999, MJT; 1♂, 1♀ Kato Fana [38°12.46′N 25°55.73′E], 20.ix.1999, MJT; 1♀ Kato Fana [38°12.54′N 25°55.72′E], 2.iv.2000, MJT; 1♂ Leptopoda [38°33.73′N 25°56.77′E], 3.v.2001, MJT; 1♂ Managros [38°27.89′N 25°56.37′E], 29.v.1998, MJT; 1♂ Managros [38°27.91′N 25°56.29′E], 4.v.2001, MJT. **Lesvos**: 1♂ Gavathas Kambos [39°16.52′N 25°58.93′E], 27.ix.2002, MH; 2♂ 2.5km S Gavathas [39°14.90′N 25°59.00′E], 5.v.2010, MH; 1♂ Komi [39°11.80′N 26°24.03′E], on *Echium plantagineum*, 16.v.2005, HD; 1♂ 1.3km N Koudouroudia [39°03.52′N 26°30.97′E], on *Coridothymus capitatus*, 1.vii.2006, CP; 1♂ same data, 9.vii.2006, CP; 1♀ 1.5km WSW Lisvori [39°06.15′N 26°11.98′E], on *Trifolium boissieri*, 12.iv.2004, OM; 2♂ 1.3km WSW Loutra [39°03.48′N 26°32.12′E], 24.v.2004, EL; 1♂ 1.8km S Molyvos [39°21.25′N 26°10.65′E], on *Trifolium nigrescens*, 30.iv.2004, EL; 1♂ Moni Perivoli [39°14.77′N 26°00.15′E], 31.iv.2010, MH; 1♂ 10km S Mytilene [39°00.85′N 26°35.43′E], on *Lavandula stoechas*, 8.iv.2004, HD; 1♂ 3.0km W Mytilene [39°06.32′N 26°31.43′E], 3.v.2004, EL; 1♂ 8.9km SSE Mytilene [39°02.27′N 26°36.22′E], 21.v.2004, OM; 1♂ 9.1km S Mytilene [39°02.32′N 26°35.97′E], on *Cardopatum corymbosum*, 22.vi.2004, MA; 1♂ 2.2km SE Mystegna [39°12.25′N 26°29.12′E], on *Teucrium divaricatum*, 15.vi.2004, MA; 1♂ same data, 15.vi.2004, EL; 1♂ 1.5km NE Parakoila [39°11.68′N 26°09.92′E], on *Echium plantagineum*, 27.iv.2005, EL; 1♀ River Almiropotamus 1.7km NW Vatera [39°01.82′N 26°10.50′E], 25.v.2010, MH; 1♂ River Christou 2km W of Dafia [39°14.03′N 26°10.70′E], 22.iv.2002, MH; 1♂ River Christou 2km W of Dafia [39°14.00′N 26°10.57′E], 27.iv.2002, MH; 1♂ River Christou 2km W of Dafia [39°14.12′N 26°10.57′E], 22.ix.2002, MH; 1♂ River Potamia 5km NW Skala Kalloni [39°12.40′N 26°10.27′E], 26.iv.2002, MH; 1♂ River Potamia 8km NW Skala Kallonis [39°13.32′N 26°08.17′E], 30.v.1998, MH; 1♂ 1♀ Vassilika [39°06.52′N 26°14.27′E], on *Onobrychis caput-galli*, 28.v.2005, HD; 1♀ Vatera, 59m [39°01.38′N 26°10.53′E], 2.vi.2003, MH; 1♂ 1km N Vatera [39°01.87′N 26°11.67′E], 7.vi.2004, EL.

There are a number of taxa described in the genus *Physocephala* which appear to be forms of *P. vittata*, being distinguished primarily by coloration or pleural dusting characters which are known to be very variable and of dubious taxonomic validity. Stuke and Standfuss (2008) reported a series of specimens from Thessalia belonging to a relatively dark-coloured morph, which was identified as *P. fraterna* (Loew, 1847). The specimens from Lesvos are often, although not always, lighter in coloration and do not accord with typical *P. fraterna*, fitting better with central European specimens of *P. vittata* or the lighter coloured form described as *P. abdominalis* Kröber, 1915.

Sicus ferrugineus (Linnaeus, 1761)

Lesvos: 1♀ 1.8km S Molyvos [39°21.25′N 26°10.65′E], on *Cistus creticus*, 30.iv.2004, EL; 1♀ 4.6km N Plomari [39°01.28′N 26°22.47′E], on *Cistus creticus*, 12.vi.2004, MG; 1♀ 1km N Vatera [39°01.87′N 26°11.67′E], on *Cistus creticus*, 10.v.2004, OM.

Thecophora atra (Fabricius, 1775)

Chios: 1♀ Marmaro Marsh [38°32.26′N 26°06.99′E], 22.x.2001, MJT. **Lesvos:** 1♀ Prophitis Ilias, 4.52km SE Vatousa [39°12.62′N 26°06.03′E], on *Hypochoeris radicata*, 23.vi.2004, EL; 1♀ same data, on *Cistus creticus*, 23.vi.2004, OM.

Thecophora bimaculata (Preyssler, 1791)

Lesvos: 1♀ Parakoila [39°09.82′N 26°08.67′E], 29.v.2003, MH.

Thecophora bimaculata has been overlooked for a long time in Europe where this commonly occurring species has, together with *T. cinerascens* Meigen, 1804, previously been reported as *T. pusilla* auct., until Stuke (2006) revised and segregated the species. *Thecophora bimaculata* is therefore reported herewith for the first time from Greece.

***Thecophora longirostris* Lyneborg, 1962**

Lesvos: 1♀ 3.5km S Agiassos [39°03.15'N 26°22.95'E], on *Taraxacum* sp., 22.vi.2004, MK; 1♂ 3.8km SSE Agiassos [39°03.28'N 26°23.83'E], on *Crepis* sp., 23.vi.2004, MK; 1♀ 3.8km SSE Agiassos [39°03.15'N 26°22.95'E], on *Matricaria chamomilla* var. *recutita*, 23.vi.2004, MK.

Thecophora longirostris is a rare but widely distributed European species that has not been recorded from Greece before.

***Thecophora* species (*atra*-group)**

Chios: 1♂ Kato Fana [38°12.49'N 25°55.73'E], 30.iv-7.v.1999, MJT; 1 specimen, Kato Fana [38°12.52'N 25°55.67'E], 2.vii.1999, MJS; 1 specimen, Pelinaeon [38°34.47'N 26°00.29'E], 14.v.2003, MJT. **Lesvos**: 1♂ 3.8km SSE Agiassos [39°03.28'N 26°23.83'E], on the flower heads of *Taraxacum* sp., 10.vi.2004, AKy; 1♂ 1.25km S Pigi [39°10.23'N 26°25.18'E], 19.v.2004, HD; 1♂ same data, OM; 1♂ same data, on *Origanum onites*, 5.vi.2004, HD.

These males belong to the *Thecophora atra* group, of which only females can currently be identified to species.

***Zodion cinereum* (Fabricius, 1794)**

Lesvos: 1♀ 1.5km WSW Lisvori [39°06.15'N 26°11.98'E], on *Centaurea solstitialis*, 13.vii.2004, MA; 2♀ 10km S Mytilene [39°00.85'N 26°35.43'E], 23.iv.2004, HD; 1♂ 3.0km W Mytilene [39°06.32'N 26°31.43'E], on *Crepis commutata*, 25.v.2004, HD.

Acknowledgements

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Lispocephala brachialis (Rondani) (Diptera, Muscidae), a second East Anglian record - On 28 June 2012 a female coenosiine muscid formed part of the catch in a white water trap used to sample Diptera in a woodland on the western outskirts of Norwich, Norfolk (V.C. 27). The trap was sited amid bramble in an open area of mainly oak and birch woodland atop a south-facing slope (TG206099).

This female readily keyed out to *Lispocephala brachialis* (Rondani, 1877) using the key by E.C.M. d'Assis-Fonseca (1968. Muscidae. Diptera: Cyclorrhapha. *Handbooks for the Identification of British Insects*, Vol **10** Part 4(b), 119 pp. Royal Entomological Society of London), who provided records from Lancashire, Glamorgan and Gloucestershire. In 1999 the species was added to the Scottish list on the basis of specimens collected from a water trap in an Edinburgh garden by Bob Saville in 1995 (Horsfield, D. 1999. *Lispocephala brachialis* Rondani (Dipt., Muscidae) new to Scotland. *Entomologist's monthly Magazine* **135,** 42). Earlier Edinburgh area material from 1953 was subsequently discovered following an examination of the collections of the National Museums of Scotland. Horsfield (*op. cit.*) also gave information received from Adrian Pont of the occurrence of *L. brachialis* at a site in the Cotswolds.

More recent records were provided by John Bratton (Diptera.info website), who found this species in his garden at Menai Bridge, North Wales in February and March 2010, and by Ivan Perry who swept males from a stack of pine trunks in King's Forest, Suffolk in April and May 2011, a first record for East Anglia (Perry, I. 2012. *British Journal of Entomology and Natural History* **25,** 168 (Annual Exhibition Report)). The discovery of this Nationally Scarce species in East Anglia suggests that it is far more widespread than the distribution outlined above indicates. Like several other *Lispocephala* species, it is usually, but by no means exclusively, found in broad-leaved woodland alongside shaded streams and the larvae are thought to be aquatic (Adrian Pont *pers. comm.*).

The capture site, whilst essentially dry, is close to frequently water-logged grassland and lies on the edge of the River Wensum floodplain, where woodland sites with ditches are available. Other noteworthy species recorded in this woodland were the limoniid cranefly *Achyrolimonia decemmaculata* (Loew, 1873) and the tachinid *Cinochira atra* Zetterstedt, 1845, the latter from an aerial trap.

I thank Tony Irwin for confirming my identification of *L. brachialis* and Adrian Pont for comments on the habitat - **STUART PASTON,** 25 Connaught Road, Norwich, Norfolk NR2 3BP

Further British records of _Chymomyza amoena_ (Loew) (Diptera, Drosophilidae) from East Kent - *Chymomyza amoena* (Loew) was added to the British list from a female taken at Dering Wood, Pluckley (TQ894444) on 27 September 2008 (Clemons, L. 2009. *Chymomyza amoena* (Loew, 1862) (Diptera, Drosophilidae) new to Britain. *Dipterists Digest* (*Second Series*) **16,** 21-25).

On 8 July 2012 I swept a male from along a damp, shaded, ride at Farthings Wood near Herne Common (TR172632) and on 5 September 2012 another male was swept from a similar ride at Church Wood, Blean (TR122595). Both woods are part of the extensive Blean complex with mature oak *Quercus robur*, hazel *Corylus avellana* and sweet chestnut *Castanea sativa* among the dominant trees - **LAURENCE CLEMONS,** 14 St. John's Avenue, Sittingbourne, Kent ME10 4NE

Dipterists Digest 2012 **19,** 179-183

It is not just time that flies in December - a winter fly project in Shropshire

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Summary

Thirty-one species of flies were recorded from Shropshire (V.C. 40) during December 2011 at The Field Studies Council Preston Montford Field Centre (SJ433144) and my home near Bridgnorth (SO705853), whilst a single fly was recorded in the Costa Coffee shop in Telford Town Centre (SJ6908). These were the first known modern adult fly records from Shropshire during any December since 1945. The uncommon muscid fly *Hebecnema fumosa* (Meigen, 1826) was found and the material included specimens that might be referable to a second *Polietes* species that is presently under investigation. The winter gnat *Trichocera major* Edwards, 1921 was taken a number of times right up until the end of December, pushing back its known flight period.

Introduction

At the end of November 2011 I had reason to interrogate the Shropshire Ecological Data Network (SEDN) invertebrate database for a project I was working on. The SEDN is the virtual local records centre run by a partnership of organisations and biological recorders in Shropshire. Whilst examining fly data I noticed that there were no records of adult flies recorded during any December of any year on the Shropshire database. The only December record of any type of fly was a larval record of the uncommon hoverfly *Cheilosia semifasciata* Becker, 1894 made from a leaf of navelwort *Umbilicus rupestris*. This record was submitted by botanist Alex Lockton following an appeal to plant recorders by dipterist Nigel Jones to look out for the tell-tale leaf mines (Jones 2007). More digging produced a December 1945 record of a fungus gnat from the Cyril Pugh collection in Manchester Museum (Dmitri Logunov *pers. comm.* to Peter Chandler). Clearly this would not do, so I decided to carry out a project to record adult flies during as many December days as were suitable to record on.

Methodology

Most work days I take my Jack Russell dog (Bella) to Preston Montford and so it seemed sensible to use the twenty minute lunchtime dog walk as an opportunity to collect flies for this project. On days off flies were searched for around my garden at home near Bridgnorth. Two methods were employed to sample Diptera. Firstly, at both study sites flies were hand potted into glass specimen tubes from fence posts, tree trunks or other handy surfaces on which they were resting or basking. Secondly Preston Montford has housed a Rothamsted light trap (SJ432143) for moth sampling since 1967 (Balai *et al.* 2012), and over the extended Christmas period, when staffing is at its lightest, I am often asked to service the trap each day I am in. So the opportunity was taken to sort out the by-catch from the Rothamsted trap as part of the survey on those days I emptied it.

Whilst dog-walking and collecting I mostly kept to the same route, taking in parts of the Preston Montford estate where fence lines were south-facing or sheltered in some way by trees or hedgerows. It is known that the micro-climate associated with this type of habitat can increase the temperature considerably which is known to be important for afternoon-flying

Diptera (Peng *et al.* 1992), and exogenous factors such as wind speed are important within a number of dipterous activities (Alderman 2010).

I opted against using a sweep net as the meadows around the site were all of a very short sward, as is customary over winter, and the fence lines were all armed to some extent with net-shredding barbed wire. Also any slightly taller vegetation was invariably wet or damp and not suited to successful sweeping.

Samples were mostly restricted to two groups of flies, the winter gnats (Trichoceridae), and anything relatively hairy that looked like a calypterate fly, such as muscids (Muscidae), blow-flies (Calliphoridae) and dung-flies (Scathophagidae). Occasionally acalypterate flies presented themselves and the opportunity to pot or separate them out of the Rothamsted by-catch was taken. These groups were also targeted at home on days in December when I was not in work.

A set of meteorological recording equipment, sited alongside the Rothamsted trap at Preston Montford, gave the opportunity to record maximum and minimum temperatures for each recording day. These are listed in Table 1 along with the sample sites by date.

Results

The weather conditions during December 2011 were exceptionally mild when compared to the harsh winter the previous year and flies were found without too much difficulty, right through the month. Only twice did the temperature dip below freezing point at night with remarkably warm temperatures overnight on 23 and 26 December. The mean maximum temperature for the month was 9.7 °C, whilst the mean minimum temperature was 3.6 °C.

Date	Maximum temperature (°C)	Minimum temperature (°C)	Flies sampled (see caption)
01/12/11	8.0	3.5	PM
02/12/11	11.5	0.0	PM
03/12/11	10.5	0.5	CF
04/12/11	8.6	5.3	T
05/12/11	6.5	2.1	PM
06/12/11	7.5	2.5	PM
07/12/11	11.4	3.9	-
08/12/11	12.5	3.2	CF
09/12/11	12.6	3.5	PM
10/12/11	9.0	-1.4	CF
11/12/11	9.0	2.2	CF
12/12/11	9.6	1.0	PM
13/12/11	6.0	2.0	PM
14/12/11	5.9	2.2	PM
15/12/11	8.0	2.2	PM
16/12/11	4.2	0.9	PM
17/12/11	6.5	-0.5	CF
18/12/11	6.0	0.0	CF
19/12/11	8.0	0.5	PM(Ro)
20/12/11	12.5	4.0	PM(Ro)
21/12/11	13.5	5.5	PM, CF
22/12/11	12.5	9.5	PM(Ro)

23/12/11	12.5	10.2	PM(Ro)
24/12/11	11.5	3.5	-
25/12/11	13.5	6.5	PM(Ro)
26/12/11	13.7	11.0	PM
27/12/11	10.5	7.8	PM
28/12/11	10.1	6.5	PM(Ro)
29/12/11	10.2	5.5	PM
30/12/11	10.0	4.0	PM(Ro)
31/12/11	10.1	5.1	CF

Table 1. Temperature data for Preston Montford during December 2011. Locality codes: PM = Preston Montford, PM(Ro) = Preston Montford Rothamsted Trap by-catch, CF = Church Farm, T = Telford.

At the start of the month the sun was still quite warming but there was enough chill in the air to make fly potting relatively easy with a steady hand. Towards the Christmas break there were a couple of extremely warm nights and days for the time of year and potting became more difficult as flies were more "flighty" in these mild conditions.

Flies were collected on most days during the month, with the exception of 7 and 24 December. On 7 December there were very strong winds for much of the day, whilst family Christmas activities began on 24 December. On 5 December it was deemed politically adroit to go Christmas shopping with my wife. Having said this, a lesser house-fly *Fannia canicularis* (Linnaeus, 1761) was noted flying around the light fittings in Costa Coffee at Telford Town Centre with some enthusiasm, so all wasn't lost that day to the cause of crass commercialism!

A total of 99 "hairy" flies and 130 winter gnats were collected during the survey, 229 in total of which 31 taxa were represented. A full list of the taxa identified is listed below. The winter gnats were identified by the author whilst the calypterate and acalypterate flies were kindly identified by Steven Falk. Flies seen and not collected, or not identified belonged to the Anisopodidae, Sciaridae, Simuliidae, and Sphaeroceridae.

• Trichoceridae;

Trichocera annulata Meigen, 1818 - Preston Montford 1, 6, 9, 11, 17, 19, 20, 23, 25, 27, 28, 29, 30.
T. hiemalis (De Geer, 1776) - Preston Montford 2, 19, 20, 21, 22, 23, 25, 27, 28, 29, 30
T. major Edwards, 1921 – Preston Montford 9, 17, 19, 20, 22, 30.
T. parva Meigen, 1804 – Preston Montford 20, 22, 25, 27, 29.
T. regelationis (Linnaeus, 1758) – Preston Montford 1, 2, 8, 9,19, 20, 21, 22, 23, 25, 27 30.
T. saltator (Harris, 1776) – Preston Montford 1, 11, 20, 23, 29.

• Lonchopteridae;

Lonchoptera lutea Panzer, 1809 - Preston Montford 23.

• Heleomyzidae;

Gymnomus caesius (Meigen, 1830) - Preston Montford 22, 28.
Heteromyza oculata Fallén, 1820 - Preston Montford 28.
H. rotundicornis (Zetterstedt, 1846) - Preston Montford 22, 23, 30.

Tephrochlamys flavipes (Zetterstedt, 1838) - Preston Montford 22.
Suillia pallida (Fallén, 1820) - Preston Montford 22, 23.

• Scathophagidae
Scathophaga stercoraria (Linnaeus, 1758) - Preston Montford 1, 20, 22, 23.

• Anthomyiidae
Hylemya nigrimana (Meigen, 1826) - Preston Montford 22.
H. vagans (Panzer, 1798) - Preston Montford 5, 13.
H. variata (Fallén, 1823) - Preston Montford 9.
Delia platura (Meigen, 1826) - Church Farm 3, 21.
Mycophaga testacea (Gimmerthal, 1834) - Preston Montford 30.
Paradelia intersecta (Meigen, 1826) - Preston Montford 1, 16, 22.

• Fanniidae
Fannia canicularis (Linnaeus, 1761) Costa Coffee, Telford 4.
F. monilis (Haliday, 1838) - Preston Montford 9.

• Muscidae
Azelia cilipes (Haliday, 1838) - Preston Montford 5, 15, 21, 28.
Hydrotaea cyrtoneurina (Zetterstedt, 1845) - Preston Montford, 5; Church Farm 10.
Eudasyphora cyanella (Meigen, 1826) - Preston Montford 14, 29.
Polietes lardarius (Fabricius, 1781) - Preston Montford 16, 20.
P. species (see discussion below) - Preston Montford 9, 14, 19, 20; Church Farm 18
Stomoxys calcitrans (Linnaeus, 1758) - Preston Montford 30.
Hebecnema fumosa (Meigen, 1826) - Preston Montford 1, 16, 22, 29.
H. nigricolor (Fallén, 1825) - Preston Montford 30.
Phaonia tuguriorum (Scopoli, 1763) - Church Farm 31.

• Calliphoridae
Calliphora vicina Robineau-Desvoidy, 1830 - Preston Montford 1, 12, 15, 20, 25.

Whilst most species collected are deemed common and widespread the muscid fly *Hebecnema fumosa* (Meigen, 1826) is noted as uncommon. It is associated with dung (Steven Falk *pers. comm.*). Material was collected of what may be a second *Polietes* species though the validity of this species is currently under investigation, with the results pending further work both here and in continental Europe (Adrian Pont *pers. comm.* to Peter Chandler).

Records for the winter gnat *Trichocera major* Edwards, 1921 are known to be quite sparse through the West Midlands with a flight period noted as October to November (Stubbs in prep.), and so it is perhaps of significance that this species was encountered regularly right through December at the Rothamsted trap. Stubbs suggests that deciduous woodland and hedgerows are the ecological lead and this survey would back that up as the trap is situated at woodland edge, with hedgerows a plenty nearby. It is noted at its second Shropshire location (Boardman 2007).

Nearly all species recorded (with exception of the commoner winter gnats) were new site records to Preston Montford (Balai *et al.* 2012). Records from Church Farm were all new tetrad records.

Most species encountered, as one might expect, are associated with the typically farmland situations at Preston Montford, including a number associated with dung, carrion, fungi, soil or similar substrates, and mammal burrows. Others are phytophagous in their larval requirements. It was pleasing that such a generally ignored time of year produced useful records and showed that with even the quietest months can offer opportunities to the determined dipterist.

All data was added to the Shropshire Ecological Data Network invertebrate database. The author would be most interested to receive on behalf of the SEDN any fly data for Shropshire not held by the database.

Acknowledgements

I would like to thank Steven Falk for his identifications and species notes, the Preston Montford tutors for supplying the meteorological data used in this article and help with the Rothamsted trap, and the Heritage Lottery Fund (HLF) through Invertebrate Challenge / The Field Studies Council for enabling this project. Many thanks are due to Dmitri Logunov of Manchester Museum for checking the Pugh collection and for most helpful comments and advice by Peter Chandler.

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A "winter" insect – the third record of *Pachycerina pulchra* (Loew) (Diptera, Lauxaniidae) from Norway – The lauxaniid fly *Pachycerina pulchra* (Loew, 1850) was in 1998 recorded as new to Fennoscandia. One female was collected near Lake Svevatn in Kvam municipality in a Barber trap between late November and late April (Greve, L., Pommeresche, R. and Skartveit, J. 1998. *Pachycerina pulchra* (Loew, 1850) (Diptera, Lauxaniidae), a species new to Fennoscandia. *Dipterists Digest (Second Series)* **5,** 95). Since then much collecting of Lauxaniidae has been done in Norway, and a review of the family in Norway based on nearly twelve thousand specimens was published (Greve, L. 2009. Atlas of the Lauxaniidae (Diptera, Brachycera) in Norway. *Norwegian Journal of Entomology* **56**(2), 75-116). Only one other specimen of *P. pulchra* was included there, another female collected fairly close to the first locality: HOI Kvam: Berge, Stekka Nature Reserve, Malaise trap.

However, perhaps *P. pulchra* is a species more common than the few records above suggest, and the clue could be the information on *P. pulchra* given by W. Schacht, O. Kurina, B. Merz and S. Gaimari (2004. Zweiflügler aus Bayern XXIII (Diptera: Lauxaniidae, Chamaemyiidae). *Entomofauna, Zeitschrift für Entomologie* **25**(3), 41-80): "This species (viz. *P. pulchra*) over-winters as an adult specimen". Also the other species of the genus *Pachycerina* in northern Europe, *P. seticornis* (Fallén, 1820) is winter active (Hågvar, S. and Greve, L., 2004. Winter active flies (Diptera, Brachycera) recorded on snow – a long-term study in south Norway. *Studia dipterologica* **10**(2003), 401-421): " both sexes were active on snow throughout the winter in several habitats mainly in cloudy, calm weather around 0°C."

The dates of the two females from HOI Kvam are: Barber trap 22.xi.1997–23.iv.1998 and Malaise trap 6.viii–13.ix.2000; this second specimen was thus not caught very late in the year. A third record, a male, was collected in 2011; this locality is in Bergen: HOY Bergen: Løvstakken ('Løvstakken' is one of the seven mountains seen from Bergen centre), N 60.354938° E 35.3319029°, 300 metres a s l, 12.ix–8.x.2011; the habitat is pine *Pinus* forest with dominance of dwarf shrubs of the plant family Ericaceae (Vaccinio-Picetea) and there is a nearby mire with *Sphagnum*.

Two of the Norwegian specimens were thus collected fairly late in the year, or perhaps early in the following year, and the records suggest that *P. pulchra* could be overlooked as the active period of the fly is late autumn, winter and early spring.

Weather in these periods of the year in the outer parts of Western Norway, and including parts of inner Western Norway, viz. the lower areas along the fjords, is not very different from that in the British Isles, where the genus *Pachycerina* is presently unrecorded, but winter collecting would perhaps discover material of *P. pulchra* and *P. seticornis* – **LITA GREVE, GUNNAR M. KVIFTE and STEFFEN ROTH,** The Natural History Collections, University of Bergen, Allègt. 41, 5007 Bergen, Norway

Observations on *Bombylius discolor* Mikan (Diptera, Bombyliidae)

- Whilst recording in Oakers Wood (SY805915, DORSET V.C. 9) on 28 March 2011, I was surprised to see a specimen of *Bombylius discolor* Mikan, 1796; this is a species that I am very familiar with, but the surprise stems from the fact that this woodland and the surrounding area are strictly acidic/heathland, and all my many observations and records of *B. discolor* are from chalk grassland or neutral grassland. Never in my 30+ years of recording in Oakers Wood have I seen it here, nor have I ever seen it on any other acidic/heathland site. It was one of two that I saw within Oakers Wood on that day.

Following this Oakers Wood observation, a trip to the Ower farm area (SY995851 DORSET V.C. 9) on the Isle of Purbeck on 12 April 2011, revealed another acidic/heathland *B. discolor* occurrence. On this occasion several were seen within a small area of acidic pasture entirely surrounded by heathland, and with strongly acidic streams bordering this pasture.

A little more than a year since my first sighting of *B. discolor* at Oakers Wood, I once again encountered this species on 30 March 2012; on this occasion I saw several individuals, two of which were males and were clearly holding territories, so any suspicion that *B. discolor* was not established at this site evaporated on that day.

Both these aforementioned sites are at least several miles from what can usually be described as typical *B. discolor* habitat; *B. discolor* is recognised as a species of predominantly chalkland and neutral soils, and its main hosts *Andrena cineraria* (Linnaeus) and *A. flavipes* Panzer are largely restricted to the same niche. As Oakers Wood is strictly acidic in nature, it is presumed that *B. discolor* could be using a different host with a more acidic toleration? Or has a predominantly chalkland or neutral soil tolerant host species now found acidic habitats acceptable? Both known *Andrena* hosts have certainly expanded their ranges in southern England in recent years (Edwards, R. and Telfer. M. (Eds) Provisional atlas of the aculeate Hymenoptera of Britain and Ireland. Part 4. 139 pp. Centre for Ecology and Hydrology, Natural Environment Research Council).

Whatever, the reason, it appears that *B. discolor* is spreading from its traditional haunts and utilising acidic sites and a possible increase in distribution can be expected – **MICK PARKER,** 9 East Wyld Road, Weymouth, Dorset DT4 0RP

***Rachispoda segem* (Roháček) (Diptera, Sphaeroceridae) new to the British list from Worcester -** On 2 July 2011 the Worcestershire Recorders visited Cherry Orchard, a drought-dry, rather sandy area of predominantly hawthorn scrub bordering the River Severn in the City of Worcester.

From the bank of the River Severn opposite the north end of the site I collected a small male sphaerocerid. Its scutellum with three pairs of marginal setae, the basal pair small, was clearly that of a *Rachispoda* though the distinctive anterior dorsocentrals were very small and inconspicuous. In the handbook by B.R. Pitkin (1988. Lesser Dung Flies: Diptera: Sphaeroceridae. *Handbooks for the Identification of British Insects* **10**(5e). Royal Entomological Society of London) it keyed to *R. cryptochaeta* (Duda, 1918) which was most unconvincing, and *R. breviceps* (Stenhammar, 1855), the companion species in the couplet, has since been deleted from the British list.

Dr Jindřich Roháček very kindly examined the specimen for me and identified it as *Rachispoda segem* (Roháček, 1991), a species fully described and illustrated in his 1991 revision of the genus. This is one of a small group of species (the *R. cilifera* group) in which the facial bulge below and between the antennae is absent, with a corresponding reduction in the size of the frontal lunule. The reduction in size of the anterior dorsocentrals is also significant in the identification. *Rachispoda cilifera* (Rondani, 1880) itself is an Eastern European species, but *R. segem* has been recorded as far west as Italy and Switzerland (J. Roháček *pers. comm.*) and as far north as Poland and the Ingria, Karelia and St. Petersburg regions of Russia (Roháček, J. 1991. A monograph of *Leptocera* (*Rachispoda* Lioy) of the West Palaearctic area (Diptera, Sphaeroceridae). *Časopis Slezského Zemského Muzea Opava (A)* **40,** 97-288).

The type specimens of the species were associated with the natural shaded banks of undisturbed rivers, with mud, sand, gravel or marginal vegetation (Roháček 1991 and *pers comm.*). The banks of the River Severn at Worcester are firm-edged, strictly maintained and far from natural. The zone from which the specimen was taken is a riverside track next to the water, unshaded and well trodden by fishermen, with few and very limited areas of natural muddy shoaling. On the other hand the water margin is overhung by tall, dense, grassy tussocks and the sloping valley sides above are densely shaded by bushes. There is a huge concrete weir in the vicinity, and the regular flooding and wide fluctuations of water level in the Severn make it difficult to generalise on the exact nature of the water margin.

The river bank location also produced specimens of *Platypalpus flavicornis* (Meigen) and *P. pallidiventris* (Meigen) (Hybotidae); *Hemerodromia unilineata* Zetterstedt and *Hilara ternovensis* Strobl (Empididae); *Dolichopus ungulatus* (Linnaeus), *Poecilobothrus nobilitatus* (Linnaeus) and *Medetera flavipes* Meigen (Dolichopodidae); *Lonchoptera lutea* Panzer (Lonchopteridae); *Sepsis cynipsea* (Linnaeus) (Sepsidae); *Opacifrons coxata* (Stenhammar), *Pullimosina vulgesta* Roháček and *Rachispoda lutosa* (Stenhammar) (Sphaeroceridae); *Discocerina obscurella* (Fallén) and *Hydrellia maura* Meigen (Ephydridae); *Delia coarctata* (Fallén) (Anthomyiidae); *Fannia manicata* (Meigen) and *F. similis* (Stein) (Fanniidae); *Hebecnema umbratica* (Meigen) and *Hydrotaea armipes* (Fallén) (Muscidae).

I would like to thank Dr Jindřich Roháček for identifying the specimen and for his advice and assistance - **MALCOLM BLYTHE,** 33 Kings Arms Lane, Stourport-on-Severn, Worcestershire DY13 0NS

Corrections and changes to the Diptera Checklist (28) – Editor

It is intended to publish here any corrections to the text of the latest Diptera checklist (publication date was 13 November 1998; the final 'cut-off' date for included information was 17 June 1998) and to draw attention to any subsequent changes. All readers are asked to inform me of errors or changes and I thank all those who have already brought these to my attention. Changes are listed under families; names new to the British Isles list are in bold type. The notes below refer to addition of 6 species, resulting in a new total of **7061** species (of which 37 are recorded only from Ireland).

An updated version of the checklist, incorporating all corrections and changes that have been reported in *Dipterists Digest*, is now available for download from the Dipterists Forum website. It is intended to update this regularly. .

Cecidomyiidae. The following change results from M. JASCHHOF and C. JASCHHOF (2009. The Wood Midges (Diptera: Cecidomyiidae: Lestremiinae) of Fennoscandia and Denmark. *Studia dipterologica, Supplement* **18,** viii + 333 pp):
Bryomyia ***apsectra*** Edwards, 1938 **spec. rev.** is revived from synonymy with *Bryomyia producta* (Felt, 1908), so replaces that name on the list.

Chironomidae. The following unnamed species is added from Ireland only in the present issue:
Macropelopia spec. Norwegen, *sensu* Fittkau 1962 ++

The following species, previously recorded in the British Isles only from Ireland, is recorded as new to Britain in the present issue (also with spelling correction from *beringiensis*):
Metriocnemus beringensis (Cranston & Oliver, 1988 – *Apometriocnemus*) +

The following species, added in the present issue, represents a subgenus new to the British Isles (all other *Metriocnemus* species remain in METRIOCNEMUS sensu stricto):
S. **INERMIPUPA** Langton & Cobo, 1997
Metriocnemus (*Inermipupa*) ***carmencitabertarum*** Langton & Cobo, 1997

Asilidae. The following species, previously recorded in the British Isles only from Ireland and the Isle of Man, is recorded as new to Britain in the present issue
Machimus cowini Hobby, 1946 +

Hybotidae. The following species are added in the present issue:
Crossopalpus ***curvinervis*** (Zetterstedt, 1842 - *Tachydromia*)
Platypalpus ***nigricoxa*** Mik, 1884

Phoridae. The following species was added by R.H.L. DISNEY (2012. A further new species in the *Megaselia pusilla* (Meigen) species complex (Diptera: Phoridae). *Entomologist's monthly Magazine* **148,** 137-145):
Megaselia ***sororpusilla*** Disney, 2012

Psilidae. The genus *Loxocera* was revised by N. BUCK and S.A. MARSHALL (2006. Revision of New World *Loxocera* (Diptera: Psilidae), with phylogenetic redefinition of Holarctic subgenera and species groups. *European Journal of Entomology* **103,** 193-219. They recognised *Imantimyia* Frey, 1925 as a subgenus including all British species except *L.*

aristata, and synonymised the European genus *Platystyla* Macquart, 1835 (not yet found in Britain) with *Loxocera* sensu stricto.

A.I. SHATALKIN and B. MERZ (2010. The Psilidae (Diptera, Acalyptrata) of Switzerland, with description of two new species from central Europe. *Revue suisse de Zoologie* **117**(4), 771-800) considered that *Platystyla* should have subgeneric status in *Loxocera* and to reflect phylogenetic relationships, consequently raised *Imantimyia* to generic status, only *L. aristata* of British species remaining in LOXOCERA:

IMANTIMYIA Frey, 1925 (including *albiseta*, *fulviventris*, *nigrifrons* and *sylvatica*)

These works also treat Loxocerini and Psilini as tribes of subfamily Psilinae; Shatalkin and Merz (*op. cit.*) recognised subfamily Chylizinae for *Chyliza*. The latter paper also concluded that *Chamaepsila nigrosetosa* and *C. unilineata* are good species, not synonyms of *C. pallida* as had been accepted in the British checklist. These were recognised as distinct species by Collin so their status in the British Isles needs now to be re-assessed.

Dryomyzidae. A catalogue and key to world genera by W.N. MATHIS and M. SUEYOSHI (2011. World Catalog and Conspectus of the Family Dryomyzidae (Diptera: Schizophora). *Myia* **12,** 207-233) has determined that the type-species designation by Westwood (1840) for *Dryomyza* is invalid and the subsequent designation by Zetterstedt (1846) of *D. anilis* as type-species should prevail. Consequently *Neuroctena* becomes a synonym of *Dryomyza* and, if the species hitherto assigned there (*D. decrepita*, *D. flaveola*) are considered generically distinct from *D. anilis*, the generic name *Dryope* Robineau-Desvoidy, 1830 should be used, resulting in the following changes

Dryomyza anilis Fallén, 1820

DRYOPE Robineau-Desvoidy, 1830

Dryope decrepita (Zetterstedt, 1838 – *Dryomyza)*

Dryope flaveola (Fabricius, 1794 - *Musca*)

Sphaeroceridae. The following species is added in the present issue:

Rachispoda ***segem*** (Roháček, 1991 - *Leptocera*)

Chloropidae. An application to ICZN to conserve the name *Oscinella* has been made by M. von TSCHIRNHAUS and E.M. NARTSHUK (2012. Case 3576. *Oscinella* Becker, 1909 (Insecta, Diptera, Chloropidae): proposed conservation by reversal of precedence with *Melanochaeta* Bezzi, 1906 and *Pachychaetina* Hendel, 1907. *Bulletin of Zoological Nomenclature* **69,** 37-43).

This results from the proposed synonymy of the two senior names involved with *Oscinella*, involving the transfer of the type species of *Melanochaeta* to *Oscinella*, and consequent raising from synonymy of *Lasiochaeta* for other species previously included in *Melanochaeta* (NARTSHUK, E.M. and von TSCHIRNHAUS, M. 2012. New generic synonyms in the Chloropidae (Diptera, Acalyptratae), with additional taxonomic notes. *Zootaxa* **3267,** 44-54). The following changes result from this:

OSCINELLA Becker, 1909 = PACHYCHOETA Bezzi, 1895, preocc. = MELANOCHAETA Bezzi, 1906 = PACHYCHAETINA Hendel, 1907

Oscinella capreolus (Haliday, 1838 - *Oscinis*)

LASIOCHAETA Corti, 1909

Lasiochaeta pubescens (Thalhammer, 1898 - *Elachiptera*)

Dipterists Digest 2012 **19,** 189-203

Pallopteridae (Diptera) in Scotland

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Summary
An assessment of Scottish Pallopteridae is made, based on 654 records in museum collections, publications and databases. One species, *Palloptera ambusta*, is deleted from the Scottish fauna and one, *P. muliebris*, is added bringing the total known in Scotland to 9 out of a British Isles total of 13. The most widespread species are *P. quinquemaculata* and *P. umbellatarum* and the most restricted are *P. anderssoni* and *P. muliebris*. Saproxylic species are more restricted in range but are possibly more abundant than non-saproxylics and for all species, relatively few records exist for southern Scotland, parts of the east and west coasts and many island groups. Adults are found from April to October and there appears to be one annual peak per species, suggesting they are univoltine in Scotland. However, some species occur most frequently in May and June while others occur mainly in July and August. Scottish pallopterids are compared to those of Norway, Ireland and Cumbria.

Introduction

The family Pallopteridae (Diptera, Acalyptratae) is small with only about 60 species worldwide and 22 in Europe (Merz 1998). In the British Isles 13 species are known (Chandler 1998, Rotheray and MacGowan 1999). Colloquially, Pallopteridae are referred to as flutter flies due to the characteristic and frequent manner in which adults wave their wings when walking (McAlpine 1987, Merz 1998). Many have species-specific wing markings (Hennig 1967, McAlpine 1987) that may darken with age (Parmenter 1942), but it is unclear if wing waving and patterning are involved in sex recognition and courtship (Merz 1998).

Biologically, pallopterids are not well known. Adults of some species have been found on flowers of umbels (Apiaceae), thistles and knapweeds (Asteraceae) (Parmenter 1951, Morge 1967, Martinek 1977) while saproxylic species are also found on dead or cut wood (Chandler 1991). They are often encountered on windows inside buildings (Collin 1951, Greve 1993) and are frequently taken in Malaise traps (Greve 1993). They could be more abundant than appreciated due to poorly studied habits of being secretive, appearing in ones and twos and being crepuscular (Collin 1951, Morge 1967, Martinek 1977).

Stubbs (1969) and Chandler (1991) summarised the biology of British species. Some have yet to be reared while for others, rearing records are old and require confirmation (Czerny 1934, Collin 1951, McAlpine 1987, Merz 1998). Nonetheless, for such a small family, larval feeding modes appear to be diverse with saprophagous, phytophagous and zoophagous habits known or suggested (Morge 1956, Ferrar 1987). They have been reared from thistle flowerheads, stems of Apiaceae, under bark of dead wood, grass tillers and conifer seed cones (Niblett 1946 and 1951, Nye 1958, Stubbs 1969, Chandler 1991, Koziol 2007). Some species may have mixed feeding modes combining phytophagy or saprophagy with zoophagy (Morge 1967, Ferrar 1987), but taxonomic confusion and misidentification may explain apparent instances of mixed feeding modes (Chandler 1991). Nonetheless, certain saproxylic species are considered of value as zoophages for controlling economically harmful infestations of bark beetles (Curculionidae, Scolytinae) (Morge 1967, Ferrar 1987).

In Scotland, the Malloch Society reared three saproxylic *Palloptera* species as part of a long-term investigation of saproxylic Diptera, one of which was new, *Palloptera anderssoni*

Rotheray & MacGowan (Rotheray and MacGowan 1999), whose existence had been suspected by Andersson (1990). In this paper we review Scottish Pallopteridae and compare the fauna to that of other parts of the British Isles and Scandinavia.

Methods

The Scottish Pallopteridae specimens assessed here were from the National Museums of Scotland (NMS), the Hunterian Museum, University of Glasgow (HM), the Natural History Museum, London (NHM) and the Oxford University Museum of Natural History (OUMNH). Peter Chandler and Ivan Perry supplied records from their collecting in Scotland and Roger Morris provided records from the database of Dipterists Forum field meetings. In addition, data were extracted from the Malloch Society Saproxylic Database (MS) (D. Horsfield *pers. comm.*) and from the literature accessed through the Scottish Insects Records Index (SIRI) maintained by the National Museums of Scotland. The latter is an almost complete listing of published records of Scottish insects (Shaw 1987). For Cumbria, S. Hewitt kindly provided data from the collection and records at Tullie House Museum, Carlisle. Data extracted from these sources included species identity, locality, date, development site and collector.

To prevent duplication, published and databased records were not added to the dataset if voucher specimens were located in collections. Where possible, identity was checked using the key in Andersson (1990), and data in Rotheray and MacGowan (1999) and Gibbs (2005) to distinguish *P. anderssoni* from the closely related *Palloptera ustulata* (Fallén). Most counties and regions referred to by collectors were those according to pre-1975 boundaries, which are used here. Copies of the full dataset have been deposited in the National Museums of Scotland.

Extracted data were compared with those from Ireland (Speight 1979), Scandinavia (Andersson 1990, Greve 1993, Greve and Jordan 2004) and Cumbria (S. Hewitt and P.J. Chandler *pers. comm.*). Rearing records, which were mainly of saproxylic species, were excluded or treated separately. This is because early stages are frequently at higher densities than adults and their inclusion would distort comparison of relative abundance based on captured adults.

Results

Scottish *Palloptera* Records

Six hundred and fifty-four Scottish *Palloptera* records were extracted from museum collections, the literature and databases (Tables 1 and 2). Most came from specimens in museum collections, about which little appears to have been published. Records covered the 125 years from 1887 to 2011, 158 localities and 27 of 31 Scottish counties and regions (Table 1); 89 were rearing records and *P. anderssoni* is only known from rearing records. Twenty-one records came from a Rothamsted style suction trap set up in the 1950s to monitor Ceratopogonidae (Diptera) at Miltonbridge, Midlothian (Campbell and Pelham-Clinton 1960). Otherwise, adult records presumably came from sweep netting or hand collecting, although this is rarely stated. No county or region had records of all recorded species and no species occurred in all counties (Table 1). The counties with most records and species were, in order: Inverness-shire, Perthshire, Morayshire and Midlothian (Table 1). The most recorded localities were: Nethy Bridge (Inverness-shire) with 36 records and 7 species; Bonhill (Dunbartonshire) 30 records, 6 species, and Aviemore (Inverness-shire) 24 records, 6 species.

Fifty-two collectors were responsible for these records and based on adult captures, the most prolific, accounting for 40% of records, were J.J.F.X. King, J.W. Yerbury and J.R. Malloch (Table 3). The majority of rearing records, 74%, come from I. MacGowan.

Table 1. Records of Pallopteridae in Scotland according to species and county or region. Columns left to right, in rank order of number of records per species in Table 2. Codes: qui = *P. quinquemaculata*; sal = *P. saltuum*; umb = *P. umbellatarum*; mod = *P. modesta*; ustu = *P. ustulata*; tri = *P. trimacula*; ust = *P. usta*; and =*P. anderssoni*; mul = *P. muliebris*. Numbers in cells are: number of records/number of localities.

County/region	qui	sal	umb	mod	ustu	tri	ust	and	mul	Localities/ county	Species/ county
Aberdeenshire				5/3		1/1	6/4	1/1		13	4
Angus	3/3		1/1	1/1			3/2	3/1		11	5
Argyllshire	1/1	2/2	2/2	5/3	1/1					11	5
Ayrshire			1/1	1/1						2	2
Banffshire	1/1				1/1	1/1				3	3
Berwickshire	1/1		1/1			1/1				3	3
Caithness			1/1		3/1	1/1				6	3
Dumfriesshire	4/2	2/1		3/3						9	3
Dunbarton-shire	4/1	12/ 2	5/1	3/1	14/ 1	6/1				44	6
E. Lothian	1/1		3/3	1/1	3/2					8	4
Fife	3/2		2/2				4/2	2/1		11	4
Hebrides	8/7	4/3	4/3	5/2	4/3	5/2				29	6
Inverness-shire	36/ 8	24/ 9	13/ 5	28/ 5	7/2	11/ 3	46/ 11			165	7
Kincardine-shire				1/1						1	1

County/region	qui	sal	umb	mod	ustu	tri	ust	and	mul	Localities/county	Species/county
Lanarkshire	9/3	2/1	3/2							14	3
Midlothian	6/1	6/3	18/6	3/3	15/8	1/1	4/1	2/2		55	8
Morayshire	11/3	13/4	12/2	2/1	1/1	19/2	1/1			59	7
Orkney	5/1									5	1
Peeblesshire			1/1		2/2					3	2
Perthshire	13/11	16/9	12/7	3/3	2/2		36/13	30/8		114	8
Renfrewshire	11/6	3/2	1/1	7/3						22	4
Ross & Cromarty	2/2	1/1	2/2	2/1			1/1			8	5
Roxburghshire	1/1	4/4	1/1		2/2	1/1				9	5
Selkirkshire		2/2		1/1			1/1			4	3
Stirlingshire	3/3		2/2	1/1			1/1		1/1	8	5
Sutherland	7/3	3/2		4/3	4/1	8/2	2/2			29	6
West Lothian	1/1									1	1
Localities /species	66	46	44	37	29	21	51	13	1		
Counties /species	21	14	19	18	13	12	11	5	1		

Table 2. Rank order of records per species based on adult captures of the most frequent Scottish Pallopteridae and number and percentage of records per species before and after 1950 (no records exist for 1950). N / % = number of records / percentage of total number of records.

species	total number of records	N / % <1950	N / % >1950
P. quinquemaculata	135	77 / 57	58 / 43
P. saltuum	93	59 / 64	34 / 36
P. umbellatarum	85	36 / 43	49 / 57
P. modesta	78	56 / 72	22 / 28
P. ustulata	59	37 / 62	23 / 38
P. trimacula	58	42 / 73	16 / 27
P. usta	57	34 / 60	23 / 40
Total	565	341 / 60	224 / 40

Scottish *Palloptera* Species

Based on the dataset, 10 of the 13 British Isles species have been recorded in Scotland (Tables 1 and 2). However, the single record of *Palloptera ambusta* (Meigen) is based on a misidentification. Hence 9 species are known from Scotland.

The most widespread species were *Palloptera quinquemaculata* (Macquart) and *P. umbellatarum* (Fabricius), recorded from 21 and 19 Scottish counties and regions respectively. The most restricted were *P. trimacula* (Meigen), *P. anderssoni* and *P. muliebris* (Harris), recorded from 12, 5 and 1 county respectively (Table 1). The number of localities per species follows a similar pattern, except for *Palloptera usta* (Meigen), which is known from 51 localities, the second highest number for any species (Table 1). This is due to rearing records from Perthshire by I. MacGowan. Except for *P. trimacula*, adult captures of the saproxylic species *P. anderssoni*, *P. usta, P. ustulata* (Fallén) and possibly *P. muliebris,* were low compared to the rest (Table 1). Summarised details of each species are:

Palloptera ambusta (Meigen)

The single Scottish record, from the Hebrides, Isle of Eigg (Kevan 1941), is represented by a specimen badly affected by mould in the NMS collections, apparently identified by Kevan as *P. ambusta*, but is a misidentification for *Opomyza germinationis* (Linnaeus) (Opomyzidae).

Palloptera anderssoni Rotheray & MacGowan

38 records (5 counties, 13 localities), 1994-2000, from eastern Scotland, Aberdeenshire to Midlothian, with most records (30) from 8 localities in Perthshire; all rearing records, adults emerging iv-vi. A saproxylic species reared from under bark of fallen wood of 6 broad-leaved tree genera: *Acer* (1 specimen); *Betula* (23); *Fagus* (3); *Populus* (3); *Quercus* (5); *Tilia* (3).

Table 3. Number of records per species from the 3 most prolific collectors, period of collecting under each name and the number of records for the remaining collectors for the periods before and after 1950. Codes: qui = *P. quinquemaculata*; ust = *P. usta*; mod = *P. modesta*; sal = *P. saltuum*; umb = *P. umbellatarum*; ustu = *P. ustulata*; tri = *P. trimacula*. * number is less than column totals due to individual collectors recording more than one species.

	qui	sal	umb	mod	ustu	tri	ust	Totals
JJFX King 1900-23	28	11	17	27	1	21	2	107
JW Yerbury 1889-1913	20	14	2	2	8	11	19	76
JR Malloch 1904-11	4	11	5	4	14	6	0	44
Total	52	36	24	33	23	38	21	227
Number of other records								
< 1950	27	27	12	17	14	4	5	106
>1950	56	30	49	28	23	16	31	143
Number of other collectors								
< 1950	9	11	9	12	1	1	3	17*
> 1950	13	14	14	18	9	5	4	22*
Total other records	83	57	61	45	38	20	36	199
Total all records	135	93	85	78	59	58	57	565

Palloptera modesta (Meigen)
78 records (18 counties, 37 localities), 1895-2011. All but one are adult captures from 28.v to 27.x; the one rearing record is from *Centaurea* flowerheads (Asteraceae) with adults emerging in March (K. Bland). This species is widespread across Scotland, from Sutherland to Dumfriesshire and Aberdeenshire to the Hebrides (Table 1). The county with the highest proportion of records, 35% from 5 localities, is Inverness-shire.

Palloptera muliebris (Harris) New to Scotland
1 known specimen, Stirlingshire, Bridge of Allan, 4.ix.2006, in a garden, R.M. Lyszkowski.

Palloptera quinquemaculata (Macquart)
135 records (21 counties, 66 localities), 1899-2010. Widespread across Scotland from the Orkneys to Dumfriesshire and Fife to the Outer Hebrides. All but one are adult captures, 26.v-14.viii. A single rearing record from a puparium found under bark of a spruce stump, *Picea*, at Twiglees, Dumfriesshire. The most recorded county is Inverness-shire, with just under a quarter of all records from 8 localities (Table 1).

Palloptera saltuum (Linnaeus)
93 records (14 counties, 46 localities), 1889-2010. Widespread across Scotland from Sutherland to Dumfriesshire and the Hebrides. All records are adult captures, 8.vi-10.viii. Inverness-shire is again best recorded, with a quarter of all records from 9 localities (Table 1).

Palloptera trimacula (Meigen)
58 records (12 counties, 21 localities), 1887-1991. Scarce, known from the north-east, the central belt, Roxburghshire in the south and the Hebrides. All records are adult captures, 17.vii-5.ix, with the highest proportion from Morayshire.

Palloptera umbellatarum (Fabricius)
85 records (19 counties, 44 localities), 1889-2002. Widespread across the central belt as far north as Morayshire and to the Hebrides in the west. Few records from southern Scotland. All records are adult captures, 23.v-25.x, with the highest proportion from Midlothian.

Palloptera usta (Meigen)
99 records (11 counties, 51 localities), 1892-2011. Widespread in eastern Scotland from Sutherland to Selkirkshire; 46 rearing records from under the bark of fallen wood of 6 tree genera including both conifers and broad-leaved trees: *Betula* (3 records); *Fraxinus* (1); *Picea* (18); *Pinus* (21); *Populus* (2); *Quercus* (1). Adult captures and emergence dates from puparia are 13.v-24.x. For adult captures, Inverness-shire (37 records, 10 localities) and Perthshire (35 records, 14 localities) have the most records.

Palloptera ustulata (Fallén)
59 records (13 counties, 29 localities), 1898-2001. Scarce but fairly widespread from Caithness to Peeblesshire, also known from the Hebrides. One rearing record, from under the bark of fallen *Tilia* wood, Perthshire, Battleby (I. MacGowan). Adult captures 8.vi-24.x, with most from Midlothian (15) and Dunbartonshire (14).

The Scottish *Palloptera* fauna compared to Cumbria, Ireland and Norway
For Norway, 579 records of 13 pallopterid species were given by Greve (1993) and Greve and Jordan (2004) (Table 4). The more diverse Norwegian fauna is due to a group of six species unknown in Scotland that are all considered rare in Europe (Andersson 1990), but they account for only 2% of Norwegian records (Table 4). Two of this group, *Eurygnathomyia bicolor* (Zetterstedt) and *Palloptera laetabilis* Loew are known from other parts of the British Isles, but are unknown in Cumbria (S. Hewitt *pers. comm.*) and Ireland (Speight 1979).

There are two species occurring in Scotland apparently unknown in Norway, *P. anderssoni* and *P. muliebris* (Table 4); *P. muliebris* is known from both Ireland and Cumbria, but only one Scottish record exists of this distinctive species; *P. anderssoni* is known from Cumbria (S. Hewitt *pers. comm.*), but it is unclear if it occurs in Ireland.

A group of 7 species comprise the most frequent pallopterids in Norway, Scotland,

Ireland and Cumbria: *P. modesta*, *P. quinquemaculata*, *P. saltuum*, *P. trimacula*, *P. umbellatarum*, *P. usta* and *P. ustulata* (Table 4). The rank order of records for these species is similar in Scotland and Norway, except for *P. quinquemaculata*, which is common in Scotland but scarce in Norway and *P. usta*, which is common in Norway but scarce in Scotland (Table 4). Although records in Speight (1979) for Ireland and in Cumbria provided by S. Hewitt (*pers. comm.*) are fewer, relative abundances appear more similar to those of Scotland than Norway with *P. quinquemaculata* being the most recorded species in both cases (Table 4). In contrast, in Ireland, *P. trimacula* and *P. scutellata* are relatively frequent, but *trimacula* is scarce in Scotland and the latter is unknown in both Scotland and Norway.

Based on monthly records per species summed across years, flight periods are similar in both Norway and Scotland with almost contemporaneous single peaks per species, but flight periods are usually longer in Scotland (Table 5). The shorter flight periods of pallopterids in Norway are possibly explained by the shorter period of maximum summer temperatures in Norway. The flight period for *P. usta* in Scotland is longer and earlier if dates are included of adult emergence from puparia. If these are excluded, then the flight period is similar to that in Norway (Table 5).

Scottish Pallopteridae through time

Records were not obtained evenly over the 125 year period they were collected. Dividing the period into before and after 1950, 60% of adult captures were made before 1950 and all species except *P. umbellatarum*, were recorded much more frequently before 1950, especially *P. modesta* and *P. trimacula* (Table 2). King, Yerbury and Malloch, the most prolific pallopterid recorders (Table 3), were only active before 1950, suggesting that it is levels of recording, rather than species, that have declined post 1950. However, for each species, the number of collectors were greater post 1950 (Table 3), which favours the alternative view, that, except for *P. umbellatarum*, pallopterids have declined post 1950. The more even distribution of records of *P. umbellatarum* is possibly because it has increased in abundance since 1950. In support of this, more specimens of this species, than any other, came from the suction trap operated post 1950 at Miltonbridge, Midlothian: 12 *P. umbellatarum*; 6 *P. ustulata*; 4 *P. usta* and 1 *P. modesta*.

Assuming that each specimen was captured in proportion to the species abundance based on all captures, then records acquired by individual collectors should be in the same proportion. This can be assessed for the 3 prolific collectors by comparing their captures against relative species abundance. None of the 3 collectors acquired records in the order expected from the total number of records, but King followed by Yerbury comes closest to it (Table 3). This suggests they were both collecting more or less randomly. However, King caught more *P. trimacula* than expected and Yerbury caught fewer *P. modesta* but more *P. trimacula* and *P. usta* than expected and Malloch also caught more *P. trimacula* than expected, as well as more *P. ustulata* (Table 3).

If the 3 most prolific collectors obtained more *P. trimacula* than expected, then perhaps this was because it was more abundant when they were collecting, i.e. it has declined since 1923. Alternatively, it may have always been scarce and recognising it as such, these collectors targeted it. The records obtained by Malloch are not matched in any way to the order from all records. Apart from more records than expected of the species noted above, Malloch has fewer records then expected of *P. quinquemaculata* and *P. modesta* (Table 3). This might reflect a different emphasis in collecting with Malloch more concerned to obtain the broadest possible selection of species than either King or Yerbury. Hence Malloch may have been more selective about what specimens he retained in his collection.

Table 4. Number of Pallopteridae records from Scotland, Norway, Ireland and Cumbria. Norwegian data (Greve 1993, Greve and Jordan 2004); Ireland (Speight 1979); Cumbria (S. Hewitt *pers. comm.*); * = excludes 48 reared specimens

Species	Norway	Scotland	Ireland	Cumbria
E. bicolor	1	-	-	-
P. ambusta	1	-	1	-
P. ephippum Zetterstedt	7	-	-	-
P. formosa Frey	1	-	-	-
P. laetabilis	2	-	-	-
P. venusta (Loew)	1	-	-	-
P. scutellata	-	-	6	1
P. anderssoni	-	38	-	6
P. modesta	130	78	1	3
P. muliebris	-	1	1	3
P. quinquemaculata	23	135	16	9
P. saltuum	112	93	6	3
P. trimacula	69	58	7	7
P. umbellatarum	73	85	13	5
P. usta	146	57*	1	1
P. ustulata	11	59	7	7
Total species	13	9	10	10
Total records	577	604	59	45

In terms of seasonal occurrence or flight periods across months, the summed range from all years and species was 7 months, from April to October, but no species was taken in all of these months and there was no month in which all species were recorded (Table 5). Nonetheless, most records, >75%, were obtained in June, July and August with the most frequent month for records being June (Table 5); *P. usta*, *P. ustulata* and *P. umbellatarum* had the longest flight period, 6 months in each case, while *P. anderssoni* and *P. trimacula* had the shortest, 2 and 3 months respectively, but the former is only based on dates of adult emergence; *P. quinquemaculata* and *P. saltuum* peaked early in the season, in May and June, while peaks of *P. modesta* and *P. trimacula* came later, in July and August (Table 5).

Table 5. Summed across years, monthly records per species of Pallopteridae occurring in Scotland (S) and Norway (N), Norwegian data from Greve (1993). * = number reared.

Species	Country	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
P. modesta	Scotland		2	5	26	40	1	2	
	Norway		2	1	58	39	16		
P. quinquemaculata	Scotland		13	63	45	5	1		
	Norway				8	1			
P. saltuum	Scotland		4	49	27	14			
	Norway		1	37	48	1			
P. trimacula	Scotland		2	0	14	51	2		
	Norway				5	38	7		
P. umbellatarum	Scotland		5	19	36	19	4	1	
	Norway			7	24	10	1		
P. usta	Scotland		1	3	11	23	11	3	
	Scotland*	2	26	16	1				
	Norway		2	1	5	13	24	1	1
P. ustulata	Scotland			3	24	20	8	1	
	Norway				5	2	1		
Total species	Scotland		7	7	7	7	4	4	
Total species	Norway		3	5	7	7	4	1	

Discussion

The pattern of pallopterid recording revealed here is probably a close approximation to that of many Diptera groups in Scotland, with recording concentrated in Strathspey, Inverness-shire and to a lesser extent, Perthshire and in two active periods: 1885-1925 and onwards from 1960. An unsurprising feature is that individual collectors only provide records from a small proportion of the sum total of localities visited by all collectors. Most collectors recorded where they lived or from a limited numbers of favoured localities. For example, all of the records from Malloch came from where he lived, Bonhill in Dunbartonshite, although it is suspected that he visited a wider area than his specimen labels suggest. King collected in and

around Glasgow where he lived, but also in areas that he visited regularly, such as Strathspey and Morayshire. A.E.J. Carter recorded pallopterids in the Edinburgh area, but moved to Perthshire where his later records mainly come from. Yerbury visited Scotland several times and although he collected in Midlothian, Perthshire, Sutherland and Wester Ross among other counties, most of his records came from where he stayed for the longest period, Nethy Bridge, Inverness-shire (Rotheray 1997). Nonetheless, with over 50 collectors involved in recording Pallopteridae, the results reveal that Scottish regions and counties are fairly well covered, although southern Scotland, parts of the east and west coasts and many islands are poorly recorded (Table 1).

For this study, records from only the most obvious sources have been assessed. Additional records undoubtedly exist in collections of other museums and with private collectors. Hence the analysis presented here is a preliminary one, but in bringing together records from obvious sources, the distribution and relative abundance of the various species has been clarified and a foundation laid for future assessments. For example, the lack of recent records and possible declines of all species except *P. umbellatarum* requires further assessment. The most severe declines appear to be of *P. modesta*, *P. saltuum* and *P. trimacula* and this points to these species being priority targets for re-assessment of status, and possibly not just in Scotland but across the British Isles to determine whether the declines, if genuine, are widespread. Based on monthly records, the best time to look for *P. saltuum* in Scotland is June and for *P. trimacula* and *P. modesta* it is August (Table 5). Whether these times are also the optima further south or whether pallopterid life cycles are fine-tuned to match climatic conditions in different parts of the British Isles, remains to be assessed. Other targets in Scotland include *P. muliebris* which is unlikely to be confined to just one locality in Stirlingshire as indicated at present. In terms of places, south-west Scotland is a target area. Few records come from this region yet, as noted below, it is an area known for outlying populations of species more widely distributed in southern England.

On the basis of the records obtained, *P. ambusta* is deleted from the Scottish fauna and *P. muliebris* is added. The former species is only known as Scottish from a single record, but it is a misidentification for the opomyzid *Opomyza germinationis*. With these changes and based on 654 records, the Scottish *Palloptera* fauna consists of 9 of the 13 British Isles species. Two of the three British Isles species not recorded from Scotland, *P. ambusta* and *P. laetabilis*, are considered rare both in the British Isles and Europe (Collin 1951, Andersson 1990). *Palloptera laetabilis* is apparently only known in the British Isles on the basis of 4 records from southern England, obtained during the period 1904-1907 and it is considered extinct in the Draft Acalyptrate Review (Falk, S., Ismay, J. and Chandler, P.J. in preparation). In Poland, *P. laetabilis* has been reared from spruce cones, *Picea abies*, although the feeding mode of the larva, as with most pallopterids, remains unclear (Koziol 2007). If this is the main development site of this species, then it is unlikely to be naturally resident in the British Isles as spruce is not a native species; possibly records from the 1900s were due to accidental introductions or the natural, but incidental, spread of vagrant individuals.

In the British Isles, records of *P. ambusta* are scattered across Southern England from Cornwall to Cambridgeshire (Falk, S., Ismay, J. and Chandler, P.J. in preparation). This suggests that it is unlikely to occur in Scotland. However, Greve (1993) recorded it from Norway and Collin (1951) stated that, in Europe, it is associated with mountainous districts. In England, Chandler (1991) recorded it from dense herbaceous or shrubby vegetation in deciduous woodland. In either case, mountains and deciduous woodland are frequent in Scotland. The third British Isles *Palloptera* species apparently absent from Scotland is *P. scutellata*. According to the NBN Gateway map (data.nbn.org.uk), this species is fairly

widespread in the southern half of England and also in Wales. It is also fairly widespread in the southern half of Ireland (Speight 1979) and it is known from Cumbria (Rusland Moss, SD335885, 17.vi.1999, a male, P.J. Chandler; Chandler *pers. comm.*). The development site is thought to be *Juncus* stems (Stubbs 1969, Chandler 1991). *Juncus* is common and widespread in Scotland, so unless climate or other factors limit it to south of the border, it is the most likely of the three British Isles species not yet recorded in Scotland to be found there. Likely places to look for it are the Solway coast and the west coast. The former is an area known to be a refuge for isolated populations of warmth-loving species whose distribution is more continuous further south (Crowson 1966) and the latter is a known migration and colonisation route for insects (Rotheray and Gilbert 2011).

As for pallopterids more frequent in Scotland, Collin (1951) noted that his *P. usta* specimens were mainly from Scotland, although referring to two captures from Norfolk. Chandler (1991) made the same point and referred to a capture he made from Essex. *Palloptera usta* is only recorded once each in Ireland (Speight 1979) and Cumbria (S. Hewitt *pers. comm.*). Based on captured adults it is, in the dataset assembled here, a fairly scarce species in Scotland, but when rearing records are added, it is more frequent. In Norway, there are more records of *P. usta* than of any other species (Table 4). These results suggest that it is indeed more frequent in the north, readily obtained in the early stages and in its northern populations possibly boreal, i.e. cold adapted.

Moreover, based on adult captures, in Scotland the three saproxylic species, *P. anderssoni*, *P. usta* and *P. ustulata*, are generally scarce as adults compared to other pallopterids (Table 2). The habits and behaviour of saproxylic adults may make them less likely to be captured. This is because they spend time on or near fallen wood (Chandler 1991), which is probably not surveyed as frequently and certainly not as easily, as sweeping herbaceous vegetation and flowers where non-saproxylics can be found. The lack of *P. modesta* records and the frequency of *P. usta* obtained by Yerbury is possibly explained by his frequent collecting from dead wood, as his diaries testify (Rotheray 1997).

Another factor could be restricted geographical range. Except for *P. ustulata*, saproxylics are most frequent on the eastern side of Scotland, non-saproxylics are more widespread. The milder west coast may not favour saproxylic pallopterids if they, or some of their populations, are boreal and cold adapted.

Despite the lack of supporting data from adult captures, saproxylic pallopterids might actually be more abundant than non-saproxylic species. This is due to the higher development potential of fallen wood compared to flowerheads or herbaceous plant stems and this factor will be exaggerated in forested areas. This may explain why, in Norway, *P. usta* is the most frequent species (Greve 1993). This will even be the case if the rearing records of *P. usta* and *P. ustulata* from flowerheads (Collin 1951) are genuine and not misidentifications, as seems probable (Chandler 1991). It is easy to be misled not just by errors in identification, but also by where puparia are found. For instance, we reared a specimen of *P. quinquemaculata* from a puparium found under bark of a spruce stump in Dumfriesshire. This species develops in the basal tillers of grasses (Poaceae) (Nye 1958) and grass was growing close to the stump surface. *Palloptera* larvae often leave the food plant and overwinter or pupate in the soil (Niblett 1951, Smith 1957) and this probably explains what occurred on this occasion.

Few of the records assembled here include details of the ecological circumstances under which adults were captured, such as the type of vegetation or plant species where they were caught. The records from Peter Chandler and records of reared specimens are notable exceptions. For example, although the dataset reveals when *P. saltuum* and *P. trimacula* can be found and where they occurred, no data exist for which habitats or plants to search.

Fortunately both species have been reared but not in Scotland: *P. saltuum* from *Heracleum* stems (Apiaceae) (de Meijere 1944) and *P. trimacula* also from stems of this plant (Chandler 1991) and, in addition, stems of *Angelica sylvestris* (Apiaceae) (Niblett 1951, Parmenter 1951). Hence areas where these plants grow are an obvious place to search. For other species, there are sometimes only old, unconfirmed rearing records to guide searching, such as those for *P. muliebris*: under bark in association with bark beetle galleries (Curculionidae, Scolytinae) (Séguy 1934). For others, there is uncertainty because of misidentifications and confused taxonomy. For instance, thistle flowerheads (Asteraceae) are recorded as the development site of *P. parallela* Loew by Niblett (1946), *P. umbellatarum* (sensu Meigen) by Parmenter (1942), *P. umbellatarum* (Fabricius) and *P. usta* by Czerny (1934) and Collin (1951), who were both citing older, nineteenth century records. *Palloptera parallela* Loew and *P. umbellatarum* (sensu Meigen) are now synonymised under *P. modesta* (Chandler 1998). However, the three species, *P. modesta*, *P. umbellatarum* and *P. usta* are very similar to each other, particularly in their wing markings, making confusion between them likely and their adult habits and development preferences require clarification.

In Scotland *P. usta* has been reared many times from under the bark of fallen wood and it seems unlikely that flowerheads would be used for development. We have seen individual *Palloptera* specimens reared from *Centaurea* flowerheads (Asteraceae) by K.P. Bland (NMS) and by Professor G. Varley (OUMNH), the latter identified as *P. umbellatarum* Fabricius. Both specimens were *P. modesta* using the key of Andersson (1990). Hence if Niblett (1946) did not misidentify his material and the old records in Czerny (1934) are correct for *P. umbellatarum* (Fabricius) then *P. modesta* and *P. umbellatarum* (Fabricius) may develop exclusively in flowerheads of knapweed (*Centaurea*) and thistles (*Cirsium* and *Carlina*) respectively. Against this are the observations of adults of *P. modesta* on thistle flowerheads, for example, those of Chandler (1991), emphasising once again, that the development sites of both these species require clarification. The probability of being able to observe adults in the field so as to discover where they might develop, as opposed to sweep netting or trapping which is usually of less value in this respect, may be affected by their reported habits of occurring in low numbers, being secretive and crepuscular. These interesting features also require study, not just for themselves but also to help discover the best ways to find and observe pallopterids.

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***Meiosimyza mihalyii* Papp (Diptera, Lauxaniidae) a northern record for a poorly known species -** During the course of identifying a mixed series of the closely related *Meiosimyza illota* (Loew) and *M. subfasciata* (Zetterstedt) (Diptera, Lauxaniidae) in the collections of the National Museums of Scotland, I encountered a male and female mounted on the same stage. *Meiosimyza illota* and *M. subfasciata* are separated on characters of the male genitalia (Collin, J.E. 1948. A short synopsis of British Sapromyzidae (Diptera). *Transactions of the Royal Entomological Society of London* **99,** 225-242; genitalia figured by Remm, E. and Elberg, K. 1979. Terminalia of the Lauxaniidae (Diptera) found in Estonia, Latvia and Lithuania. *Dipteroloogilisi Uurimusi* **6,** 66-117). The genitalia of the male were not visible due to the way the abdomen and overlying legs had dried, but on relaxing and clearing the specimen, the genitalia did not match either species.

Another similar species is *M. mihalyii* (Papp, 1978), recently added to the British fauna by J. Cole and A. Godfrey (2004. *Meiosimyza mihalyii* (Papp, 1978) (Diptera, Lauxaniidae) new to Britain, with a note on the status of *M. obtusa* (Collin). *Dipterists Digest (Second Series)* **11,** 107-110). The genitalia of the relaxed male fitted *M. mihalyii* (genitalia described and figured in Papp, L. 1978. Contribution to the revision of Palaearctic Lauxaniidae (Diptera). *Annales historico-naturales Musei nationalis Hungarici* **70,** 213-231). The paired gonites on either side of the aedeagus are about equally long in *M. mihalyii* (gonites apparently absent in *M. subfasciata* and unequal in length in *M. illota*) and the right one, viewing the insect from above with the head facing away, has one apical corner drawn out to a point (Greve, L. 2002. Further records of Norwegian Lauxaniidae (Diptera). *Norwegian Journal of Entomology* **49,** 63-65). The degree to which this point is drawn out is apparently variable and the NMS specimen is most similar to the variant in Fig. 2 of Cole and Godfrey (2004).

The two specimens were collected by the late O.W. Richards during an entomological survey of Beinn Eighe NNR, Ross and Cromarty, north-west Scotland. A small label is on the main pin, authored by Richards and written in blue ink, bearing the number '64009'. Nigel Wyatt (*pers. comm.* to Peter Chandler) states that Richards wrote collection data on index cards which are at the Natural History Museum, London. The card for 64009 states that the specimens were collected *in copula* on 13 July 1947 from 'pasture, top of valley, Beinn Eighe'. However Richards appears to have copied the date incorrectly as following cards for 13 July are all for 1953. Also, with the specimens is a printed label giving 1953 as the date.

Cole and Godfrey (2004) gave six records of *M. mihalyii* from Ayrshire, Durham, Derbyshire, the Isle of Skye and South Yorkshire. The record from Richards extends the northern limit of this species in Britain and is the oldest, compared to those in Cole and Godfrey (2004) whose dates span 1983-2003. These records indicate a northern distribution in England and a north-western distribution in Scotland. Apparently, *M. mihalyii* is common in Norway (Greve, L. 2009. Atlas of the Lauxaniidae (Dipt. Brachycera) in Norway. *Norwegian Journal of Entomology* **56,** 75-116) and has a montane distribution in central Europe (e.g. Merz, B. 2002. Einführung in die Familie Lauxaniidae (Diptera, Acalyptrata) mit Angaben zur Fauna der Schweiz. *Mitteilungen der Entomologischen Gesellschaft Basel* **52,** 29-128). I am grateful to Andy Godfrey, Peter Chandler and Nigel Wyatt for help in preparing this note – **GRAHAM E. ROTHERAY,** National Museums Collection Centre, 242 West Granton Road, Edinburgh EH5 1JA, g.rotheray@nms.ac.uk

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