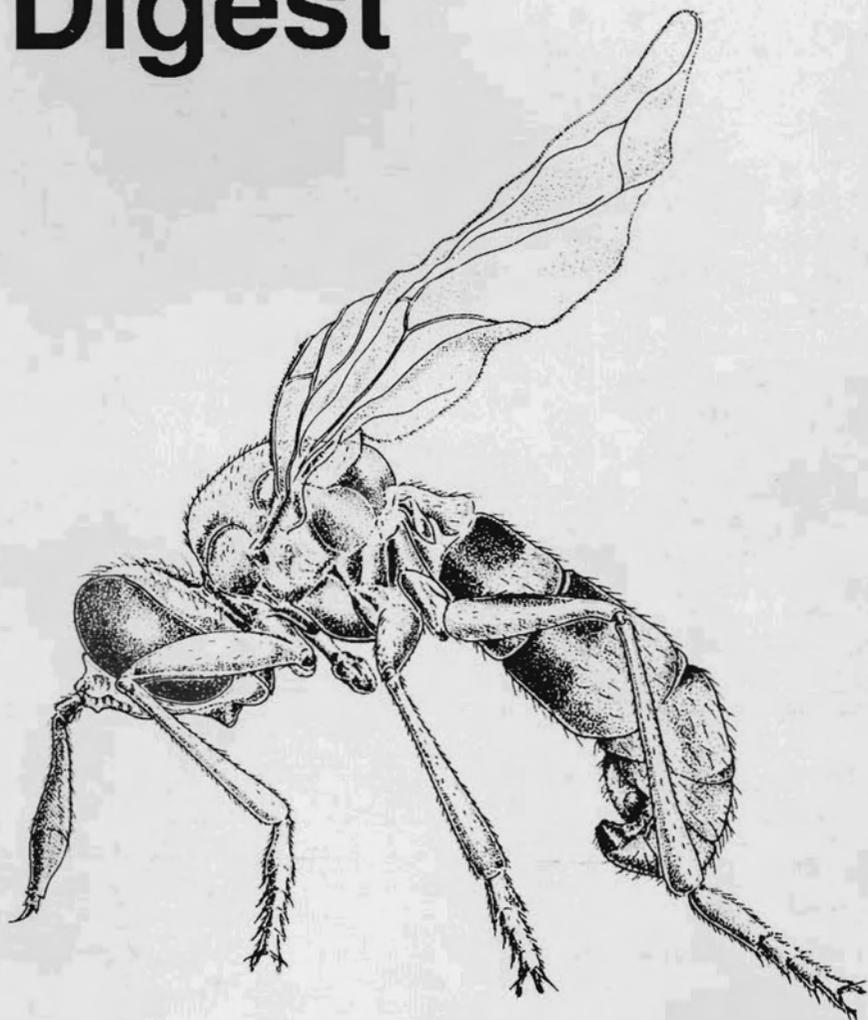


Dipterists Digest



No. 7

1990

Dipterists Digest is a popular journal aimed primarily at field dipterists in the UK, Ireland and adjacent countries, with interests in recording, ecology, natural history, conservation and identification of British and NW European flies.

Articles may be of any length up to 3000 words. Items exceeding this length may be serialised or printed in full, depending on the competition for space. They should be in clear concise English, preferably typed double spaced on one side of A4 paper. Only scientific names should be underlined. Tables should be on separate sheets. Figures drawn in clear black ink, about twice their printed size and lettered clearly.

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Initially the scope of Dipterists Digest will be:-

- Observations of interesting behaviour, ecology, and natural history.
- New and improved techniques (e.g. collecting, rearing etc.).
- The conservation of flies and their habitats.
- Provisional and interim reports from the Diptera Recording Schemes, including provisional and preliminary maps.
- Records of new or scarce species for regions, counties, districts etc.
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- Notes on identification, additions, deletions and amendments to standard key works and checklists.
- News of new publications/references/literature scan.

Texts concerned with the Diptera of parts of continental Europe adjacent to the British Isles will also be considered for publication, if submitted in English.

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Larval and puparial records of some hoverflies associated with dead wood (Diptera, Syrphidae)

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Almost all our understanding of the distribution and abundance of hoverflies depends on records of adults. However, judging status on the basis of just one stage of an insect can mislead. In the Insect Red Data Book, for example, the hoverfly, *Callicera rufa* Schummel, is considered to be endangered and close to extinction (Shirt, 1987). However, using larval stages to record *C. rufa*, rather than the usual adult stage, we found it in pine woods all over Scotland (Rotheray & MacGowan, 1990). Although *C. rufa* is specialised, it is clearly not endangered and close to extinction.

Is this exceptional? We do not know, but it throws doubt on the supposed status of other rare or uncommon hoverflies whose larval stages have not been searched for in any systematic way. Below are larval records of some hoverflies obtained from dead wood. These are given in the hope of encouraging others to "test" the rarity of these and related hoverflies by looking for their larvae. Larvae were identified either by rearing them through to adults, in which case this is stated in the text, or by comparing them with named material in the collections of the National Museums of Scotland. In many cases, however, identification was possible in the field and, when it was unnecessary to retain vouchers, larvae were returned to their feeding sites along with excavated material.

***Ferdinandea cuprea* (Scopoli)**

Gartfairn Wood, nr Balmaha, Lomondside, NS 4389, 2.ix.1989: six larvae under loose bark in sap run at base of a *Quercus* tree.

Quercus/Betula woods west side of River Shin, 6 miles north of Bonar Bridge, Sutherland, NC 5700, 8.ix.1990: six larvae in sap flow at base of a *Quercus* tree.

***Ferdinandea* sp.**

Bolderford Bridge, Brockenhurst, Hants., SU 2903, 29.iii.1990: ten empty puparia attached to the underside of loose bark close to sap flows induced by *Cossus* moth caterpillars at the base of a *Quercus* tree.

Ferdinandea larvae and puparia can be separated from those of other genera by their possession of saprophagous mouthparts (ie absence of external mouth-hooks or mouthparts adapted for piercing), absence of crochets and a posterior breathing tube with a constriction just below the tip. Hartley (1961) describes the puparium of *F. cuprea*. The puparia from Brockenhurst cannot be confirmed as *cuprea* because both British *Ferdinandea* species occur in Hampshire and no means exists to distinguish between their larval stages.

Previous records of *Ferdinandea* larvae are given by Lundbeck (1916) who refers to observations of *F. cuprea* from sap runs on *Aesulus*, *Acer* and *Populus*.

Ferdinandea larvae are obviously not exclusively associated with *Cossus* moth caterpillar damage as the above record from Scotland shows, but this was expected as *F. cuprea* is

more widespread than *C. cossus*.

***Myolepta luteola* (Gmelin)**

Denny Wood, New Forest, Hants., SU 3305, 11&12.iii.1990: eight larvae from a small, wet rot-hole (diameter of opening < 15cms) about 9m up a recently fallen *Fagus* (adult reared); two larvae from a large rot-hole (opening > 20cms) about 2m up an old, fallen *Quercus* (the large hollow interior of this tree was partially filled with wet decaying heartwood and other material); two larvae from a small, wet rot-hole about 2m up an old fallen *Quercus*.

Wandlebury Common, Gog Magog Hills, Cambridge, TL 4953, 18.v.1990: several larvae in a small, wet rot-hole about 1m up a small *Fagus* (width of trunk about 14cms) (adult reared).

Weald Country Park, Brentwood, Essex, TL 4953, 19.v.1990:

six larvae found in a large, wet rot-hole between 3-4m up an old *Aesculus*.

Third (= final) stage *Myolepta* larvae can be recognised by their size of about 15mm long with a tail (= anal segment) of about 4-6mm. Also, the basal part of the tail tapers to about half abdomen width at the end of which is a pair of fleshy projections, and the thorax lacks hooks and a band of spicules across the prothorax. Hartley (1961) describes the larva in greater detail.

Lundbeck (1916) and Hartley (1961) both record *M. luteola* from *Fagus*. Becher (1882) found it in rot-holes of *Populus* and Lundbeck (1916) refers to a record from *Acer*. It is also known from *Ulmus* (I. Perry, pers. comm.). In summary, the larva of *M. luteola* is found in rot-holes of varying sizes on a wide variety of small and large deciduous trees. It is found in rot-holes high and low on trees.

***Sphegina clunipes* (Fallen)**

Crichton Glen, Midlothian, NT 3860, 17.xi.1988: six larvae under bark of fallen *Betula* and *Quercus* branches in a stream.

Newbattle Abbey, Midlothian, NT 3265, Nov. 1989: several larvae under bark of fallen deciduous branches partially submerged in a stream.

Wood Crates, New Forest, Hants., SU 2608, 28.iii.1990: two larvae in sap run at the base of a *Fagus* tree (adult reared).

Ord Ban, nr Aviemore, Speyside, NH 8808, 14.vi.1989: two larvae under bark of recently fallen *Populus tremula* L.

Sphegina larvae can be recognised by the following characters: size 6-8mm long; short tail; dorso-ventrally flattened body; crochets present; thorax without hooks. Hartley (1961) provides a key to the three British species.

Hartley (1961) reared all three British species, finding them under wet decaying bark and also recording *S. clunipes* in sap runs on *Ulmus*. My records confirm these findings. Larvae under bark are not necessarily associated with streams: the *P. tremula* tree was lying in a shaded woodland well apart from water. The larvae were, however, found in wet patches of decay under the bark.

Mallota cimbiciformis Fallen

Denny Wood, New Forest, Hants., SU 3305, 10.iii.1990: five larvae in small, wet rot-hole about 7m up a recently fallen *Fagus*.

Wood Crates, New Forest, Hants., SU 2608, 27.iii.1990: two empty puparia in large, wet rot-hole about 4m up an old fallen *Fagus*.

Wandlebury Common, Gog Magog Hills, Cambridge, TL 4953, 18.v.1990: three puparia and one dead larva in a small, wet rot-hole about 1m up a large *Fagus*; several larvae and puparia in a small, wet rot-hole about 1m up a small *Fagus* (width of trunk about 14cms) (adult reared).

Weald Country Park, Brentwood, Essex, TL 4953, 19.v.1990:

one empty puparium in a large, wet rot-hole between 3-4m up an old *Aesculus*.

The third stage larva and puparium of *M. cimbiciformis* are easily recognised. The "rat-tailed" larva has three pairs of short, fleshy projections at the posterior end before the tail and lacks any kind of pubescence on the dorsal abdominal segments so that the body surface appears smooth. These features also characterise the puparium. Hartley (1961) and Maibach & Goeldlin (1989) provide descriptions.

M. cimbiciformis is known from rot-holes in *Ulmus* (Britten, 1916), *Fagus* (Lundbeck, 1916), *Aesculus* (Coe, 1953a) and *Acer* (Lundbeck, 1916; Maibach & Goeldlin, 1989). Its presumed preference for rot-holes high in trees (eg Hartley, 1961) is not borne out by the records presented here. In summary, like *M. luteola*, *M. cimbiciformis* is found in rot-holes of varying sizes and heights on a wide variety of small and large deciduous trees.

Myathropa florea (L.)

Milton Wood, nr Blairgowrie, Perthshire, NO 1651, 28.viii.1989: three larvae in shallow, water-filled crevices on the bark of a fallen *Betula*. These crevices contained decomposing leaves and other debris.

Newbattle Abbey, Midlothian, NT 32/365, 15.xi.1989: several larvae in shallow, water-filled crevices on the bark of a fallen *Aesculus*; three larvae in wet decaying heartwood at the base of a fallen *Fagus*. 13.v.1990: five larvae from wet, decaying heartwood at the base of a rot-hole about 4m up a recently cut *Acer*.

Denny Wood, New Forest, Hants., SU 3305, 16.v.1989 & 11-13.iii.1990: numerous larvae in wet decaying roots of *Fagus* stumps (adult reared).

Wood Crates, New Forest, Hants., SU 2608, 28.iii.1990: two larvae in large, wet, sap run about 1m up a live *Fagus*.

Weald Country Park, Brentwood, Essex, TL 4953, 19.v.1990: two larvae in sap run about 3m high on a *Aesculus*.

Chatsworth Park, Derbyshire, SK 2670, 17.v.1990: several larvae in a deep, water-filled crevice on the bark of a large fallen *Fagus*. A female *M florea* was observed for several minutes extruding her ovipositor in small cracks and crevices around the margin of this water-body.

The larva of *M. florea* is easily separated from other rat-tailed syrphid larvae in that its anterior spiracles are pale brown (dark brown in other species) and the first three pairs of abdominal prolegs have crochets arranged in semi-circular rows. Hartley (1961) describes the larva in more detail.

M. florea is a common and widespread species usually associated with water-filled hollows on live *Fagus* (Stubbs & Falk 1983). However, my records show that it breeds in a wide range of dead wood microhabitats from rot-holes high in the canopy to decaying roots underground and shallow pools of water on the bark of fallen trees. It even breeds in sap runs. Few dead wood species appear to utilise as wide a range of breeding sites as does *M. florea*. The only common dead wood microhabitat in which this species has yet to be found is under bark.

Xylota sylvarum (L.)

Denny Wood, New Forest, Hants., SU 3305, 17.v.1989 & 11.iii.1990: numerous (5-50+) larvae underground in wet decaying roots of *Fagus* stumps.

The larva and puparium of this "short-tailed" species can be recognised from other similar species by the absence of hooks on the thorax, the presence of three pairs of fleshy projections on the lateral margins of the tail, and posterior S-shaped spiracular slits with the arms of the "S" less than the diameter of the circular plate around which the spiracular slits are arranged. Hartley (1961) gives more details of the larva of this species.

Coe (1953b) reared *X. sylvarum* from puparia found in a rotten damp cavity at the base of a *Quercus* trunk. Hartley (1961) found larvae in wet sawdust and under decomposing bark of a *Fagus* stump. A. Stubbs (pers. comm.) has reared it from a rot-hole. The present records add a further breeding site for *X. sylvarum*. However, judging by the large numbers of larvae found (50+ in some roots), decaying roots are probably a major breeding site for this species. It is likely that the larvae found by Hartley (1961) under decomposing bark had, in fact, ascended from decaying roots to pupate. I found larvae about to pupate and puparia in similar situations at Denny Wood suggesting that this species does not normally feed under bark. Ascended larvae may also explain how Coe (1953b) found his puparia at the base of an oak trunk.

Xylota xanthocnema Collin

Chatsworth Park, Derbyshire, SK 2670, 17.v.1990: ten puparia from a small rot-hole about 18cms high on a small *Quercus* in woods behind Chatsworth House. Most of the puparia were partially buried in moist material at the sides and surface of the rot-hole. Adults emerged 25-30.v.1990.

The larva and puparium of *X. xanthocnema* are very similar to *X. sylvarum* and is distinguished from that species by the arms of the "S"-shaped spiracular slits which are as long as or longer than the diameter of the circular plate. Hartley (1961) describes the larva of this species.

The only previous rearing record is Hartley (1961) who found larvae in the exudate and rot-holes of *Taxus* trees. The present record, from rot-holes on *Quercus*, suggest that it will be found in rot-holes on a wider range of trees.

Callicera rufa Schummel

The following records, all from Scotland, are due to I. MacGowan and additional to the ones given by Rotheray & MacGowan (1990). All are based on finding single larvae in

rot-holes on *Pinus sylvestris* L. Additional larvae may have been present but after the first larva was found, searching was discontinued to minimize disturbance. Allt Saigh, NH 4519, 29.xi.1988; Forest Lodge, Abernethy, NJ 0214, 27.xii.1988; Lochgarthside, NH 5219, 28.xii.1988; Glen Strathfarrar, NH 2939, 2.i.1989; Rhidorroch, NH 2393, 5.i.1989; Darroch Wood, NH6138, 26.iii.1989.

Callicera larvae can be recognised by the short tail, partially fused prolegs, and possession of two groups of three or four, large, curved hooks on a common base, one each side of the prothorax.

The record of *C. rufa* from Glen Strathfarrar is pleasing because on an earlier visit, as reported in our paper (Rotheray & MacGowan, 1990), we did not find *C. rufa* larvae. These additional records further demonstrate that *C. rufa* is widespread in Scotland.

Discussion

Many of the larval records in this paper extend the known distribution of the species in question. *X. xanthocnema*, for example, is new to Derbyshire (D. Whiteley, pers. comm.). *M. cimbiciformis* has not been recorded from Cambridgeshire for many years (I. Perry, pers. comm.) and it was only known in Essex from one other site (Payne, 1989; C. Plant, pers. comm.). Except for *M. florea* and the records from the New Forest, most of the others are new site records. Some of these sites have been subject to regular visits from entomologists but the adults have not been seen. Larvae, however, were easy to find.

It is clear that hoverflies breeding in well defined microhabitats, such as rot-holes and sap runs, are easier to record in the larval than the adult stage. The short flight periods and elusive habits of the adults make them difficult to record with consequent underestimates of their status.

Looking for larvae has other advantages. Breeding sites can be investigated at any time because their associated hoverflies are double brooded and have growth periods of more than a year so that larvae are continuously present. Furthermore, individual rot-holes, sap runs etc are often used again and again by succeeding generations making long-term monitoring of populations a feasible prospect.

Nonetheless, dead wood is scarce and vulnerable to disturbance. Care and restraint is needed when searching it. The surface layers of many rot-holes are dry but these should not be ignored because lower down wet conditions often occur, and it is in the deepest, wettest parts that larvae are found. However, the drier upper layers also need careful searching as puparia may be present.

Sap runs often appear to be unsuitable because they are small and temporary. However, they can sometimes be more extensive and permanent than external conditions suggest because moist decaying sap, in which larvae develop, often accumulates between the bark and the sapwood and is hidden from view. This occurs particularly when sap runs result from fractures due to storm damage creating a gap between the bark and the sapwood. The external part of the sap run should not be ignored because larvae are often found

in and around crevices and flaking pieces of bark. Finally, rot-holes and sap runs are not difficult habitats to find. They are natural and consistent parts of the woodland ecosystem.

Acknowledgements

It is a pleasure to thank F. Gilbert, S. Hewitt, I. Hudson, M. Oates, R. Payne, C. Plant, I. Perry, A. Stubbs and D. Whiteley for help in the field and sharing their knowledge of hoverflies and particular sites where they may be found.

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The fourth-stage larva of *Atrichobrunettia angustipennis* (Tonnoir)
(Diptera:Psychodidae Psychodinae)

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Introduction

The tribe Brunettiini, as defined by Vaillant in 1982 and (more accurately) in 1986, comprises more than 50 species, most of which occur in the South-Eastern part of Asia, in Australia and particularly in the islands between these two continents. There are also a few species in temperate Asia, in Europe, Africa and America. Surprisingly, nothing so far was known about the immature stages of these flies; the only information on the subject concerns a species of *Brunettia*, and was given in Duckhouse, 1966 on page 217: "The only larva of *Brunettia* known to me is that of *alternata* (Satchell). This resembles the larva of *Mormia*, but differs greatly from that of *Setomima nitida*, briefly described by Quate (1955)". Apparently Duckhouse never formally described this *Brunettia* larva.

Quite recently, Dr. J.A. Good from University College in Dublin collected specimens of insects in Pollardstown Fen (known also as Newbridge Fen) not far from Dublin. Among them he found larvae and imagines of Psychodidae, which he passed to us for examination. These belonged to a number of species, and all - both larvae and imagines - were easily identifiable specifically, with one exception: six fourth stage larvae were conspicuous and appeared to be very different from all Psychodid larvae described to date. It happens that there were, among the imagines collected, several male and female specimens of *Atrichobrunettia angustipennis* (Tonnoir), which belongs to the Brunettiini. The species was described by Tonnoir in 1920, but the descriptor made no figures. In 1987 and 1989, Withers gave new descriptions and provided figures of both a male and female of *A. angustipennis*. The conspicuous larvae were collected where the imagines of *angustipennis* had been caught, and on the same day, so there are strong probabilities that they belong to that species; absolute certainty would only occur if larvae were obtained from eggs laid by definite *angustipennis* females. Both the larvae and imagines were found on tufa surrounded by a sphagnum bog. Water with a high calcium content was oozing through the tufa, keeping it permanently wet. As stated above, larvae of other species of Psychodidae were also present; they all belong to species which are common in macicolous environments, particularly on dripping rocks covered with moss, having a limy coat. These other species will be treated in two separate papers. The locality in which these specimens were obtained was described in 1984 by Doyle.

The fourth-stage larvae of many species of Pericomini, Telmatoscopini, Psychodini and Maruinini are well known; those of at least three species of Setomimini *sensu* Vaillant 1986 are described. The last tribe of the subfamily Psychodinae, i.e the Brunettiini, have no recorded information whatsoever concerning the immature stages. We shall give here as precise a description as possible of the fourth-stage larva of *Atrichobrunettia angustipennis*, with many details enabling comparison with larvae of Psychodinae belonging to other tribes. The information obtained will enable us to try to discover the true relationship of the Brunettiini *sensu* Vaillant among the Psychodinae. The nomenclature here used is given by

Vaillant, 1971. The six larvae arrived in a vial containing 70% ethyl alcohol; they were covered with limy silt which was removed with a brush in distilled water. The specimens were all boiled in caustic potash, cleaned with acetic acid and mounted in Canada Balsam, each on a separate slide; one was set in profile and the five others placed either with ventral or dorsal aspect uppermost. The head capsule of two specimens was opened and spread out as is shown in figure 2.

Description of the larva (fig 1-5 and 9-32)

Head capsule about as long as wide, perfectly smooth between the basilar annuli of the setae; there are no tubercles on it and the insertions of the muscles on the capsule cannot be seen by transparency, unlike most other species of Psychodinae. Frons rather wide. Clypeus lozenge-shaped (fig. 2 and 5). There is a notch between each paraclypeal lobe, which is very short, and the anterior border of the cheek on the same side. Each antenna is at the end of a truncated cone (fig. 1 and 3) and there is an eye just behind (fig. 4). The setae are crowded at the anterior part of the capsule, leaving the posterior part bare. Each seta 10 is between an antenna and the paraclypeal lobe, and each seta 15 is just behind setae 11, 11b, 12 and 12b on the same side (see Vaillant, 1989). On each side, seta 16 is just behind seta 8. Setae 9, 11c, 18 and 23 are missing. There is only one pair of postcephalic setae (fig. 2). Each messor has but 4 teeth (fig. 9). The mandible (fig. 10 and 11) has an almost rectangular first segment, with a row of short spines dorsally; the dorsal seta is remarkably large; both the monopectinate seta and the bipectinate seta (which actually appears in this species to be monopectinate also) are short, fan-shaped and with stout hairs. The maxilla (fig. 12) has reduced plates. The hypostomium (fig. 14) has only two teeth, which are close together. The body is only slightly depressed, but appears to be wide due to its lateral tufts of hairs. On the body in front of the siphonal segment there are 4 large tergal plates, which are on thoracic segment I, 34 small dorsal plates and 34 lateral plates, 32 of which have a most peculiar shape and cover knobs; these latter are kidney shaped and at the end of short peduncles (fig. 19, 21 and 29). There are no plates on the ventral surface of the body. Behind thoracic segment I there is a series of 25 dorsal transverse ridges (R, fig. 15, 19 and 20). The tegument, between the plates, is of an alveolar texture, as in other larvae of other Psychodinae, but the alveoli are rather small and the limits between them do not appear clear; on the dorsal surface of the body, each alveolus has only one spine on a socle (fig. 27), but on the ventral surface, the socle of each alveolus has several small spines (fig. 28); here and there, several socles coalesce to form a "wart", devoid of spines; most of these are at the limit between segments. It is easy to see that, on the dorsal surface, the socles of the spines are smaller and closer on a ridge than on either side of it; this appears in fig. 26, which represents a magnified part of a ridge with ordinary tegument in front of and behind it. Anterior spiracles short and stout (fig. 20 and 25).

Both thoracic mesotergite I and metatergite I are in two parts, with a complete set of true setae (fig. 18); setae 5, 15, 18 and 19 of thoracic segment I are small and branched; one or both of the setae 19 can be outside the plates. There is a number of accessory setae on the 4 plates of thoracic segment I; they are represented on the left side of fig. 18 and on figure 20. True setae 9, 10 and 11 are on a plate on each side of thoracic segment I (fig. 20), together with many accessory setae, but true seta 8, which is very small, is on an independant basilar annulus between this last plate and mesotergite I. Thoracic segments II and III are alike, with, on dorsal and lateral aspects, a complete set of true setae, all on ridges; setae 11, 12 13 and 14 are on a triangular plate, setae 4, 5 and 6 on a

kidney shaped projection; setae 1, 2, 3, 10, 15 and 16 are small, branched and set independantly, as is seta 7, which lies in front of the kidney shaped projection; this latter and the triangular plates have several long accessory setae (fig. 20). On the ventral surface of the thorax, the pedichetae appear clearly, but the distribution of the remaining chetae is different from that seen in other larvae of Psychodidae. The first seven abdominal segments are alike, with three annuli and three transverse dorsal ridges, the anterior one very low and incomplete; each segment has four small plates, each bearing true and accessory setae (fig. 16 and 17); annulus 1 and 2 have, on each side, a kidney shaped projection bearing accessory setae (fig. 21); all seven segments have a complete set of true setae (fig. 19); on each side 2, 4, 7 and 12 are set independantly on a ridge; 3 is alone on a very small plate; 8, 9, 10 and 11 are together on a triangular plate; the anterior kidney shaped projections have no true setae, but the posterior ones bear setae 13, 14 and 15 which are on annulus 2 rather than 3, the condition which occurs in all other known Psychodinae larvae. Setae 5, 6, 16, 17 and 18 are set independantly on the ventral surface and are small; the anterior annulus of each abdominal segment I to VII has two remarkable accessory setae (fig. 15 and 19), set on an ordinary socle, the spine being here replaced by a long seta. The siphonal plate is reduced in length (fig. 31) and has seven to twelve pairs of lateral accessory setae, and five or six pairs of dorsal ones; it has a complete set of true seta, except for seta 6, which is missing because the siphon is incomplete and does not extend all round the hind part of the body; true setae 1 and 5, along with the latero-anal seta, are especially strong. There are neither adanal setae nor adanal plates. The preanal area is mebraneous, covered with long hairs, which are modified spines; the four preanal true setae are far in front of the anal slit. The ventral flabellar stems are stout and dorsoventrally depressed; the dorsal ones are small, but bear rather long setae (fig. 31); there is a complete fringe of accessory setae between the dorsal flabellar stems (fig. 31).

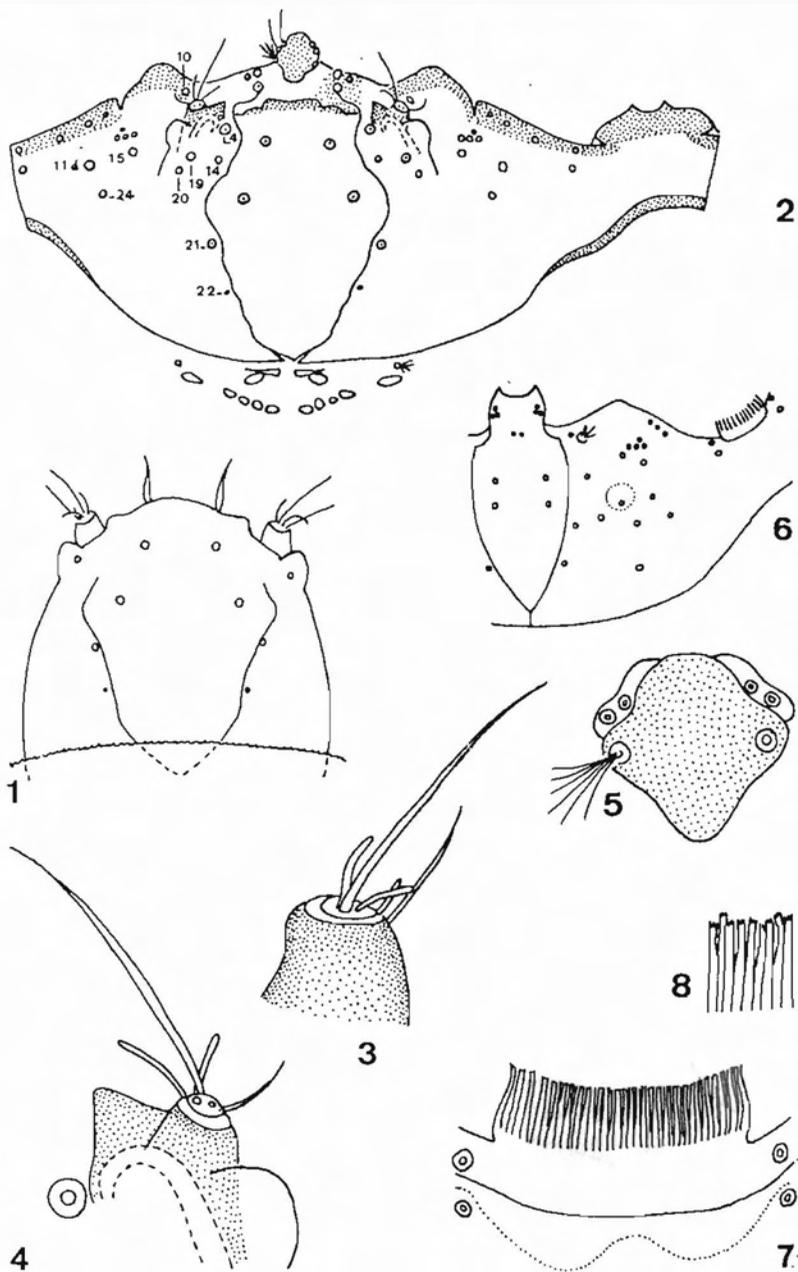
The six specimens from which the above description has been derived have been disposed of as follows: 1 in collection F. Vaillant, 1 in collection R. Wagner, 2 in collections of the British Museum (Natural History) and 2 in the National Museum of Ireland, Dublin.

Important characters of the larva

We now compare the larva of *Atrichobrunettia angustipennis* to those of other species of Psychodinae, and show which of its characters are particularly notable.

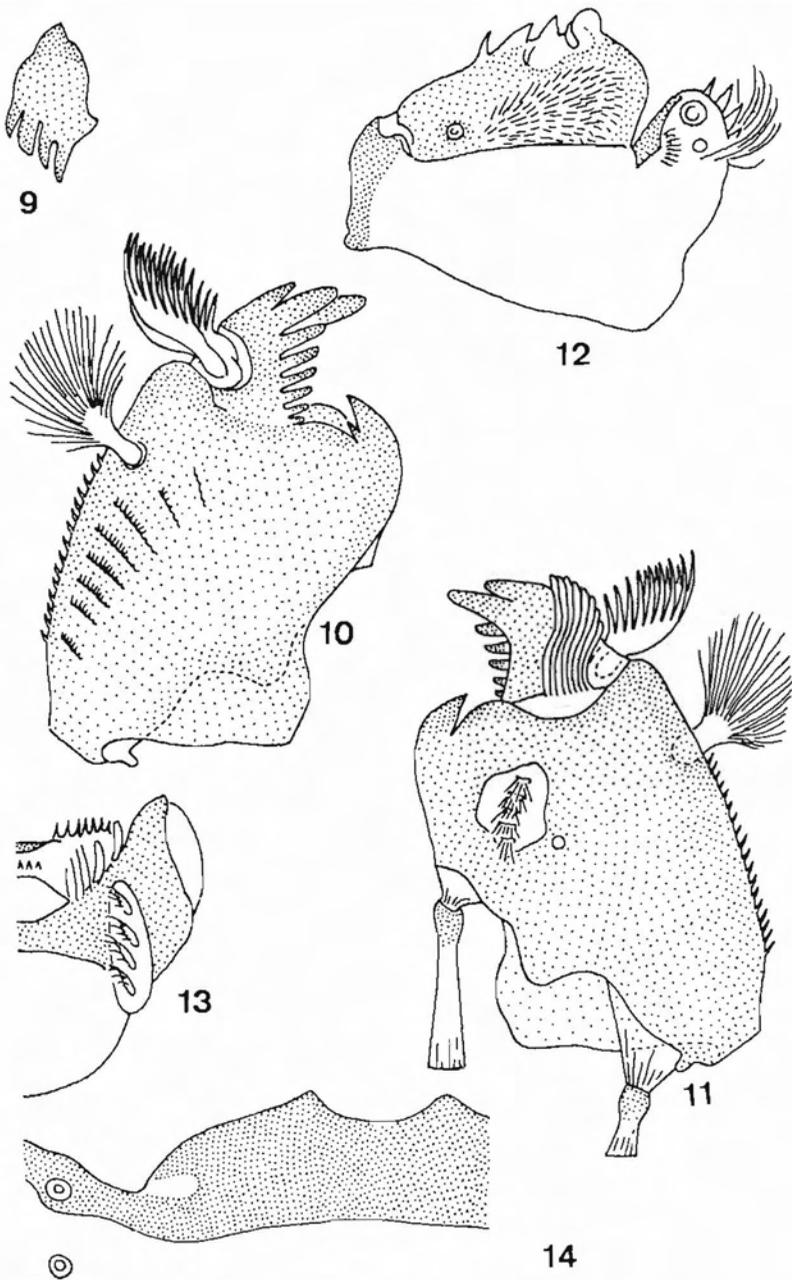
The five most remarkable, shared with the larvae of no other species of Psychodinae known so far:

1. hypostomium with only 2 medial teeth
2. abdominal segment I has 3 annuli and is built in a similar way to the six following segments. This is unique among all Psychodinae; in all known Pericomini, Telmatoscopini, Setomimini, Maruinini and most Psychodini, the first abdominal segment has only two annuli and the following ones have three; for some Psychodini, all the abdominal segments have only two annuli.
3. thoracic segments II and III and abdominal segments I to VII have no medial dorsal plates, only very small dorsolateral ones; this is another unique character among the Psychodinae; larvae of some Psychodini have no plates on the anterior part of the body including the prothorax, but have large medial plates on one or more posterior abdominal segments.

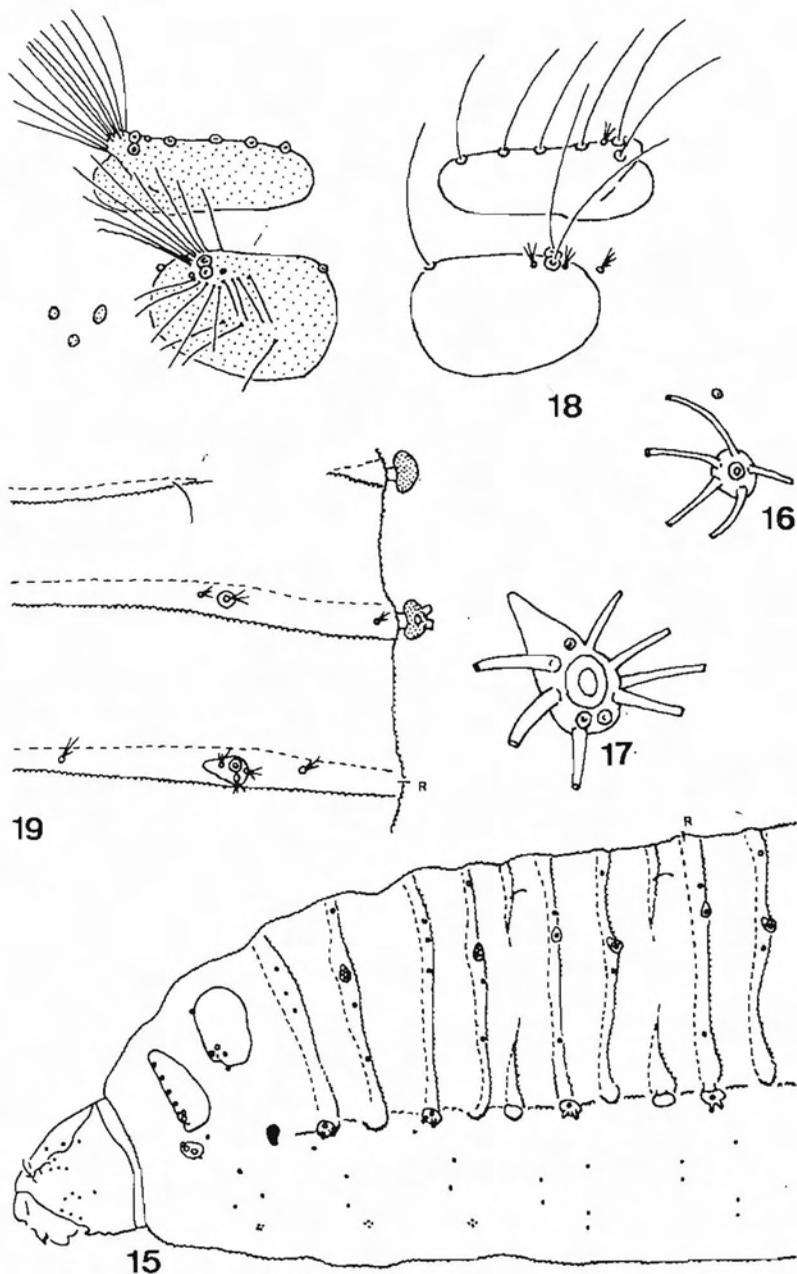


Figs 1-5. fourth-stage larva of *Atrichobrunettia angustipennis* (Tonnoir), 1, head, dorsal. 2, head capsule spread out between slide and cover-glass. 3, right antenna, detail of fig. 1. 4, right eye and right antenna, detail of fig. 2. 5, clypeal plate, dorsal, detail of fig. 2.

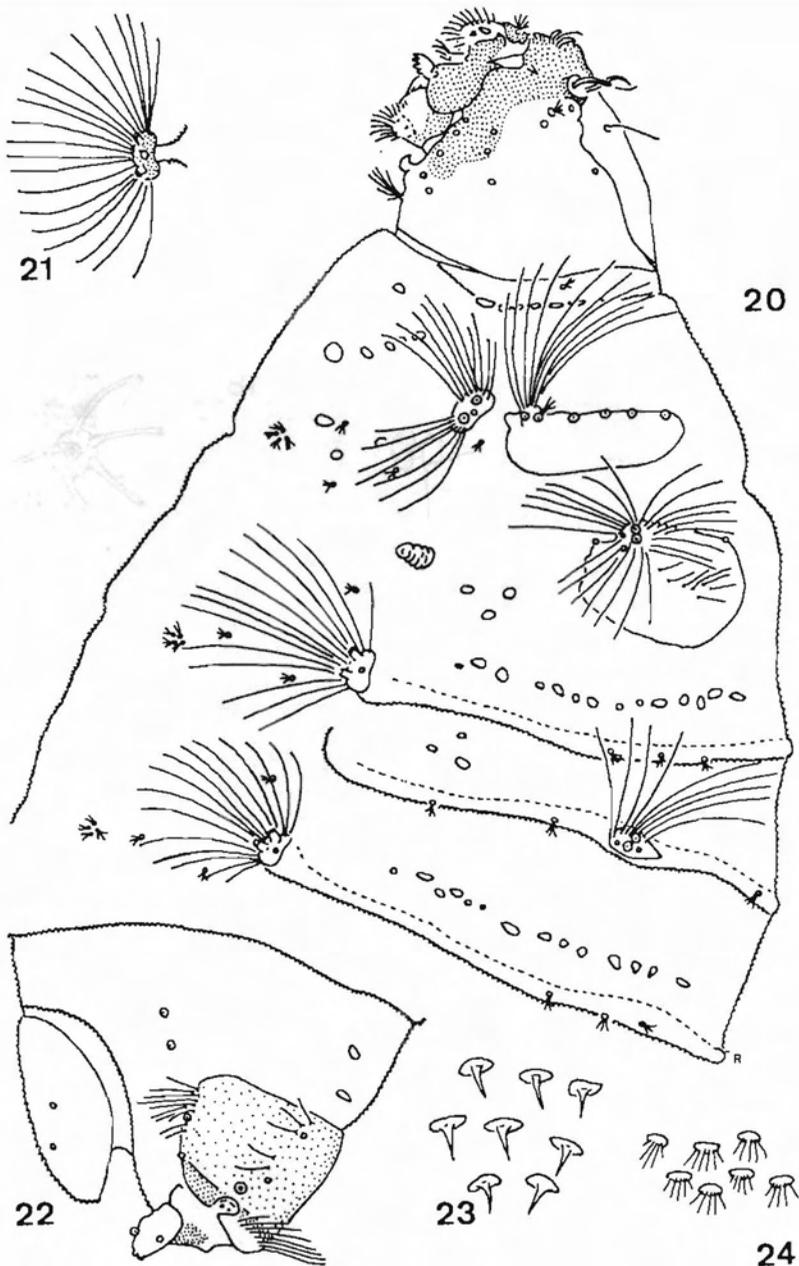
Figs 6-8. fourth-stage larva of *Mormia tenebricosa* (Vaillant). 6, head capsule spread out. 7, hypostomium, ventral. 8, detail of fig. 7.



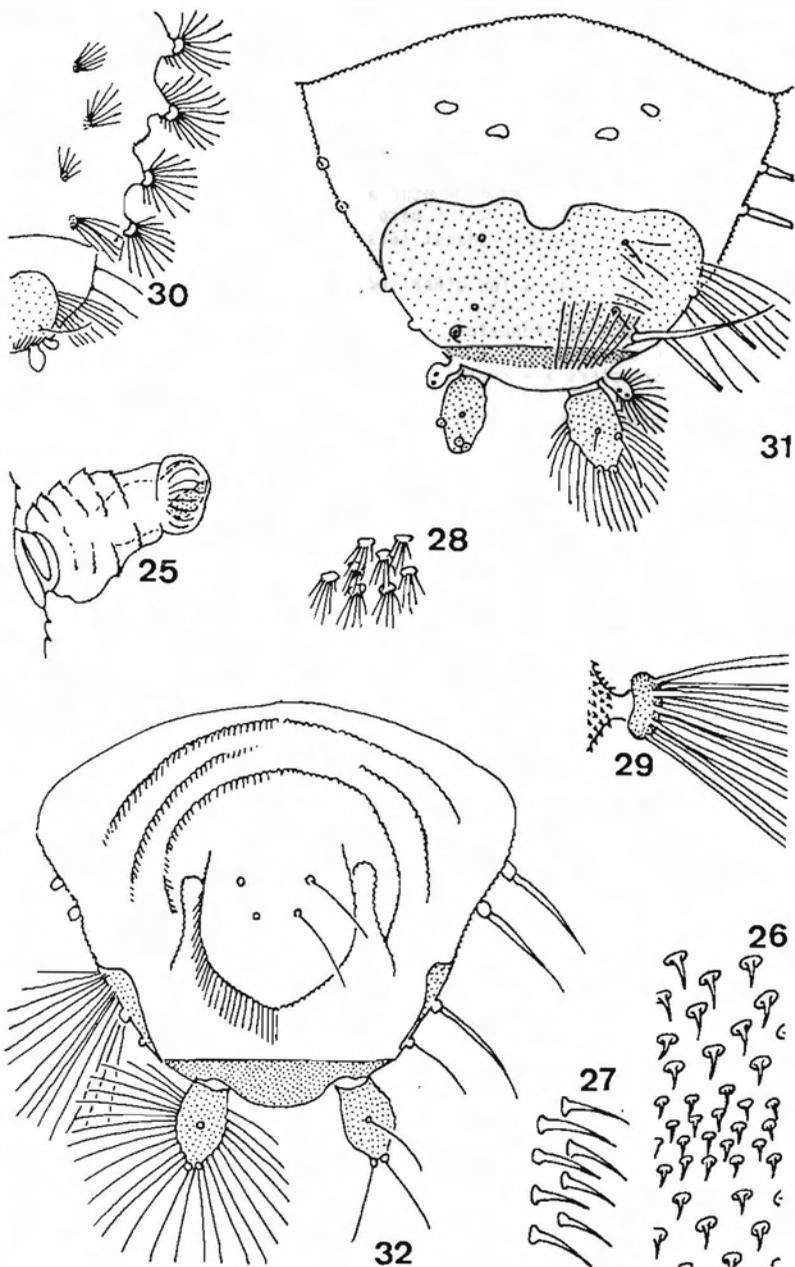
Figs 9-14. fourth-stage larva of *Atrichobrunettia angustipennis* (Tonnoir). 9, right messor, profile. 10 and 11, right mandible. 10, external view. 11, internal view. 12, left maxilla, external view. 13, left part of hypopharynx and labium, ventral. 14, hypostomium, ventral.



Figs 15-19. fourth-stage larva of *Atrichobrunettia angustipennis* (Tonnoir). 15, anterior part of larva, profile (the accessory setae on the plates are not figured, only the basilar annuli of the true setae at their base). 16, plate on annulus 2 of abdominal segment I. 17, plate on annulus 3 of abdominal segment I. 18, plates on thoracic segment I, with 3 warts (on the right side, only the true setae are figured, and on the left side, only the accessory setae are figured). 19, right side of abdominal segment IV, dorsal (accessory setae not figured, except on annulus 1).



Figs 20-24. fourth-stage larva of *Atrichobrunettia angustipennis* (Tonnoir). 20, anterior part of fig. 15 enlarged (the accessory setae and the small branched true setae are figured). 21, left kidney-shaped projection on annulus 2 of abdominal segment IV. 22, siphonal segment, profile. 23, dorsal spines on membranous part of siphonal segment. 24, ventral spines on membranous part of siphonal segment in front of adanal area.



Figs 25-32. fourth-stage larva of *Atrichobrunettia angustipennis* (Tonnoir). 25, right anterior spiracle, dorsal. 26, spines on dorsal side of abdominal segment IV, with part of the dorsal ridge. 27, spines on dorsal side of abdominal segment IV, seen in profile. 28, spines on ventral side of abdominal segment IV. 29, right kidney-shaped projection on annulus 1 of abdominal segment IV, dorsal. 30, hind part of body on its right side, dorsal. 31, siphonal segment, dorsal. 32, siphonal segment, ventral. R = dorsal ridge.

4. on abdominal segments I to VII, true setae 13, 14 and 15 are on the second annulus, not the third, as they are for larvae of all other Psychodinae larvae with three annuli on abdominal segments II to VII; we consider this the most important character of all.

5. neither adanal plates nor adanal setae are present. Only larvae of a few species of *Psychoda sensu lato*, which have an anal tubercle, have no adanal plates, but they always possess adanal setae.

Characters shared with only a few other species:

1. antennae at the end of truncated cones, the eyes being very close to the cones and most of the cephalic setae crowded in the front part of the head capsule; these characters are shared only with the larvae of *Clytocerus*.

2. mandibles with massive pectinate and bipectinate setae, also a feature of *Clytocerus*.

3. siphonal plate which is wider than long, with an incomplete siphon; once again, *Clytocerus* is the only other larva with this feature.

4. the anterior limit of the preanal area is indistinct and the preanal setae are at a distance from the posterior margin of this area; most *Mormia* larvae share at least the second of these characters, as do those of *Feuerborniella* and *Trichopsychoda*. The larvae of *Coprotopsychoa*, although possessed of a preanal area, have no preanal setae. Most *Psychoda sensu lato* larvae have no preanal area, but have preanal setae.

Discussion

In 1978, Duckhouse (p. 336) stated "...*Brunettia* is far closer to *Mormia* than to *Neoariseus*, but Vaillant puts *Mormia* in the Telmatoscopini", and further, on p. 343: "The affinities of *Mormia* are not with *Telmatoscopus*, but with the brunettoid genera, especially *Brunettia*, as shown by the structure of the adults and also of the larvae (Duckhouse 1966: 217). Vaillant places *Mormia* with *Telmatoscopus* in the dubious tribe Telmatoscopini...". More recently, in 1987, Duckhouse considers that the tribe Brunettiini *sensu* Vaillant is invalid, and he puts together in the tribe Mormiini Enderlein *sensu novo*, genera *Brunettia*, *Atrichobrunettia*, *Gerobrunettia* and *Mormia*. The arguments used to remove this last genus from the Telmatoscopini and place it with the Brunettiini *sensu* Vaillant are based mainly on characters of the antennae and wings of male imagines, but he also cites the similarity between larvae of *Brunettia* and those of *Mormia*, which seems to us doubtful.

We have examined the fourth stage larvae of seven palaeartic species of *Mormia*: they are all rather short and massive, with many accessory setae and with a very short siphonal segment and small fiabellar rods. The seven species differ by rather unimportant characters, so that, considering fourth stage larvae, *Mormia sensu lato* can be considered a well individualised genus. The larvae of three species have already been described (Vaillant 1971-1983), but that author had not examined details of the cephalic capsule for any of them. We did this for one species, *Mormia tenebricosa* (Vaillant) and spread the head capsule out for several larvae (Fig. 6). It was noticeable that the number and distribution of the setae on the head was almost identical to that seen in one species of *Telmatoscopus* and another of *Panimerus* (Vaillant 1989), but very different from that shown here in figure 2 for *Atrichobrunettia angustipennis*. In *Mormia tenebricosa*, the hypostomium of the larva has several rows of ribbon-like teeth, but in other *Mormia* species there is only the one row,

as in most species of *Panimerus*, which certainly belong in the Telmatoscopini. Considering other characters, *Mormia* larvae and *Panimerus* s.s larvae are almost alike, except that the accessory setae are more numerous in *Mormia* than in *Panimerus*, and the siphonal plate is usually a little shorter for the first than for the second; the only important distinctive character is the position of the adanal setae. *Mormia* larvae of several species do not have dorsal flabellar stems. Many (maybe all) *Mormia* larvae do not live in a permanently wet environment (unlike those of *Panimerus*), but in a moist one, so that they have many accessory setae, which retain silt and moisture, and a reduced siphon with very short flabellar stems, because their respiratory cupula does not have to extend to the surface of the water.

The larvae of *Atrichobrunettia angustipennis* share very few characters with those of *Mormia*, but share several with those of *Clytocybus*. Is this significant, if we consider that the position of *Clytocybus* among the Psychodinae is very uncertain ?

It is quite evident that *Mormia* should remain in the tribe Telmatoscopini, close to *Telmatoscopus* and especially to *Panimerus*. The characters of the imagines are not the only ones to be considered in establishing relationships. *Brunettia*, *Atrichobrunettia* and *Gerobrunettia* should be assembled in a distinct tribe.

Resumé

La tribu des Brunettiini, qui fait partie des Psychodidae Psychodinae, est assez bien connue en ce qui concerne les imagos, mais on ne savait absolument rien jusqu'ici au sujet de ces insectes sous leurs formes immatures.

Six larves de dernier (quatrième) stade d'une espèce de Brunettiini, *Atrichobrunettia angustipennis* (Tonnoir), ont été recueillies en Irlande sur un tuf entouré par un tourbière à sphaignes. Elles sont décrites ici en détail. Par de nombreux caractères elles se montrent extrêmement différentes de toutes les larves de Psychodinae connues jusqu'ici. Les larves dont elles se rapprochent le plus sont celles de *Clytocybus*; la position de ce dernier genre est restée jusqu'ici imprécise.

En se basant sur les caractères des imagos mâles, les Brunettiini semblent être très voisins des *Mormia*, classés jusqu'ici parmi les Telmatoscopini; de sorte que Duckhouse (1987) a réuni les *Mormia* et les Brunettiini en une même tribu, celle de Mormiini. La connaissance de ces larves permet de montrer qu'en fait *Mormia* doit demeurer parmi les Telmatoscopini.

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Psychoda lativentris Berdén, a moth fly new to Britain

Phil Withers

In my recently published handguide to the moth fly fauna of Great Britain (Withers, 1989) I anticipated further faunal additions. Within a month of publication some samples sent to me revealed a specimen of *Psychoda lativentris* Berdén, a species not hitherto found in Britain; this brings the British list to 90 species.

The discovery of this species in Britain is not altogether surprising. Quate (1955) demonstrated that *Psychoda alternata* Say is, in fact, a complex of at least three species in the northern hemisphere, one of which Berdén (1952) had already recognised as distinct in the female sex. Members of the *alternata* group are immediately recognisable as they are very large, compared to other *Psychoda* and the tips of the denuded wing veins have dark markings. The female subgenital plate has no median digit, and some authors (e.g. Jezek 1977) have considered these features sufficient grounds to warrant the resurrection of the genus *Tinearina* to house these species; it is my stated opinion, however, that further subdivision of *Psychoda* is at present premature.

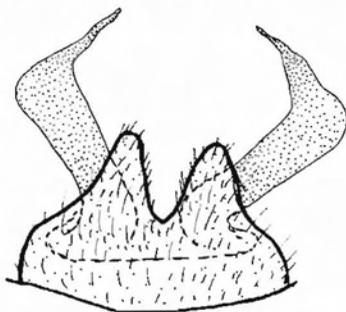
The female subgenital plate (figure 1) is quite different from that of *alternata*, the only other species of this complex to occur in the palaeartic region, and identification is therefore simple. The species

occurs very sparingly across western Europe (Illies, 1978), and is certainly rarer than *alternata*, with somewhat different ecological requirements. Berdén (l.c.) found his type specimens around a polluted pond in Akarp, in Skania province, Sweden, but warned that typical *alternata* were also present, so it is clear that both may occur to collectors, although in my experience, *alternata*, too, is decidedly rare, away from sewerage beds.

The case for *lativentris* to be considered as a parthenogenetic species is unresolved - suffice to say that only two putative males are known from western Europe, and figures of these (see Jezek l.c) demonstrate such slight differences as not to be convincing.

The solitary female specimen which prompted this note was collected at Runnymede Ponds, Surrey (TQ 005720) on 14.vii.89 by P.J. Chandler. It was swept from marginal vegetation around the three ponds below Cooper's Hill. This is the second notable addition to the British psychodid fauna for which he is responsible, and my express thanks go to him for his diligence.

fig.1



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SOME NEW RECORDS OF FUNGUS-BREEDING PHORIDAE (DIPTERA)

R.H.L. Disney and R.E. Evans

The following records of scuttle flies result from rearings carried out by R.E.E., mainly from fungi. The flies were identified by R.H.L.D. The fungus nomenclature follows Phillips (1981).

Megaselia berndseni (Schmitz)

86 reared from *Agrocybe praecox* (Pers. ex Fr.) Fayod collected at Sparham Pools, Norfolk (Grid. ref. 63/0718) 4 June 1987. Three from *Psathyrella candolleana* (Fr.) Maire collected at Welborne, Norfolk (63/0609) 4 July 1988. One from *Russula ionochlora* Romagn collected at Sparham Pools, Norfolk (63/0718) 23 July 1988. The species has been reared from *P. candolleana* before, and from 18 other fungus species (Schmitz, 1948, Eisfelder, 1956, Buxton, 1961, Disney & Evans, 1979, 1988). The other two fungi represent new host records.

Megaselia bovista (Gimmerthal)

One from *Calvatia excipuliformis* (Pers.) Perdek. collected at Sparham Pools 23 July 1988. It has previously been reported from the related fungus *Langermannia gigantea* (Batsch ex Pers.) Rostk. (Gimmerthal, 1848, Disney & Evans, 1982).

Mr. D.G. Notton reared 12 from a rotten *Agaricus augustus* Fr. collected at Tanner's Lane, Oxon (41/710774) 30 July 1989. Colyer (1954) and Hussey (1961) reported the species from *Agaricus bisporus* (Lang) Pilat. However, with the recognition of confusions between *M. bovista* and *M. abdita* Schmitz (Disney, 1987) there was introduced an element of doubt regarding the rare records of *M. bovista* breeding in *Agaricus*. The present record therefore serves to support these previous records for *M. bovista*.

Megaselia flavicans Schmitz

Six from *Nolanea farinolens* Orton collected at How Hill, Norfolk (63/3719) 17 July 1988. Four from *Entoloma sericeum* (Bull. ex Merat) Quel. collected at East Wertham Reserve, Norfolk (52/9088) 22 July 1988. Three from *Russula ionochlora* Romagn collected at Sparham Pools. These are all new host records for this species, which has been reared from 18 other fungus species (Schmitz, 1948, Eisfelder, 1956, Disney & Evans, 1978, 1982, 1988).

Megaselia hirtiventris (Wood)

Two from *Paraisaria dubia* (Delacr.) comb. nov. and/or the swift moth larva (Hepialidae, *Hepialus lupulinus* (L.)) on which it was growing, collected at Welborne, Norfolk 18 March 1984. Six reared from a seeding head of *Plantago lanceolata* L. (the Ribwort Plantain) collected at Bacton Wood, Norfolk (63/3030) 21 August 1988. The flies emerged in May 1989, along with a Tortricid moth, *Aphelia* (= *Tortrix*) *paleana* (Hubner) and a Braconid. A second larva of *A. paleana* failed to develop. Perhaps in both these cases the fly larvae were exploiting moribund moth larvae. Nine from *Agaricus langei* (Moller) Moller collected at Ditton Park Wood, Cambridgeshire (52/6757) 7 June 1987. Eight from *Agaricus augustus* collected at Sparham Pools, Norfolk 23 July 1988. This species has previously been reared from *Agaricus augustus* as well as from *A. silvaticus* Schaeff. ex Secr. and *A. campestris* L. ex Fr., and also from two other fungus species (Eisfelder, 1956, Disney & Evans, 1988). The other rearings are new host records.

Megaselia lata (Wood)

Three from *Amanita rubescens* ([Pers.] Fr.) S.F. Gray collected at Bacton Woods, Norfolk (63/3030) 7 July 1985. This confirms previous records for this host (Eisfelder, 1956, Disney & Evans, 1979).

Megaselia lutea (Meigen)

Two from *Russula ochroleuca* (Pers. ex Secr.) Fr. collected (by R.H.L.D.) at Malham Tarn, mid fen, North Yorkshire (34/8867) 29 August 1983. Nine from *Russula maculata* Quel. et Roz. collected Naborough (53/7511) 18 July 1987. 143 specimens from *Russula alutacea* (Pers. ex Fr.) Fr. collected at Holt Country Park (63/0832) 1 July 1988. Twenty from *Russula foetens* (Pers. ex Fr.) Fr. collected at Bacton Woods, Norfolk, 21 August 1988. Five from *Russula vesca* Fr. collected at Pentney Common, Norfolk (53/7213) 24 August 1988. Four from *Russula ionochlora* Romagn collected at Sparham Pools, 23 July 1988. The records from *R. alutacea*, *R. foetens*, *R. ionochlora* and *R. maculata* represent new host records; bringing the total of known fungus hosts for this species to more than 40 species (Schmitz, 1948, Eisfelder, 1956, Buxton, 1961, Disney & Evans, 1978, 1982).

Megaselia lutescens (Woods)

Twenty nine from a galled *Panaeolus campanulatus* (Bull. ex Fr.) Quel. collected at Thompson Common (52/9395) 3 July 1988. Two from a galled specimen of the same species collected at East Wretham Nature Reserve (52/9088) 22 July 1988. This is a new host record, but the species has been reported from a galled specimen of *Panaeolus*

subbalteatus (Berk. and Br.) Sacc. (Disney & Evans, 1988) and from galled specimens of *Panaeolus* sp. (de Meijere, 1947, Buhr, 1965). Eisfelder (1956) reared it from *Russula foetens*.

Megaselia scutellaris (Wood)

Eighteen from *Gyroporus castaneus* (Bull. ex Fr.) Quel. collected at Felthorpe Woods, Norfolk (63/1417) 4 May 1988. This is a new host record. The species has been recorded from ten other fungus species (Schmitz, 1948, Eisfelder, 1956, Buxton, 1961, Disney & Evans, 1988).

Megaselia uliginosa (Wood)

More than forty from *Lepista sordida* (Fr.) Ding. collected at Honingham, Norfolk (63/0911) 20 November 1988. This is the first published record of this reared from a named fungus.

The records reported above from *Agaricus langei*, *A. silvicola*, *Agrocybe praecox*, *Calvatia excipuliformis*, *Entoloma sericeum*, *Gyroporus castaneus*, *Lepista sordida*, *Nolanea farinolens*, *Panaeolus campanulatus*, *Russula alutacea*, *R. ionochlora* and *R. maculata* are the first records of named Phoridae from these fungus hosts. The apparent rearing of *Megaselia hirtiventris*, a well established fungus breeder, from moribund moth larvae requires further investigation as to whether this is a common alternative to fungus breeding in this species.

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Syntormon luteicornis ; a species new to the
British Isles (Dolichopodidae)

R. M. Blackith , R. E. Blackith and M. C. D. Speight

Speight and Meuffels (1989) record the occurrence in Ireland of females of the rare dolichopodid fly *Syntormon setosus* Parent and provide a key to separate these females from those of the only slightly less uncommon species, *Syntormon miki* Strobl, which was first found in Ireland in 1983 (Speight,1986). Examination of extensive catches from a Malaise trap, run for some 6 weeks in Blackditch Wood, Co. Wicklow, Ireland within a few hundred metres of the ditch where the females of *setosus* were found, and where we have also collected *S. miki* , yielded 3 males of a small species which is almost certainly not that of *setosus* but the male of yet another species rare enough for the male to be as yet incompletely described, *Syntormon luteicornis* Parent. Published records of this latter species are restricted to Belgium and southern France (Parent,1938) . There are no further published records of this species and no specimens can be found in Belgian collections (M.Pollet, Pers.Comm.) It also appears in a key to palaeartic *Syntormon* species by Negrobov (1975) : he presumably saw the male of *S. luteicornis*, but we are unable to trace any formal description of it. There is a tendency for females to be encountered more frequently than males in this group of species, possibly because of the females' longer flight season.

It is remarkable that three such rarely recorded species of one genus should have been found in one small, coastal, wooded area. Neither *setosus* nor *luteicornis* are included in Fonseca's (1978) keys to the *Syntormon* species of the British Isles, so we have taken this opportunity to indicate how *S. luteicornis* might conveniently be incorporated into those keys , as well as briefly describing its male.

Syntormon luteicornis Parent

Co. Wicklow : 3 males , 15 - 20 July 1989 Irish Grid reference O 3103 (PU.3) Murrough, Blackditch Wood , Malaise Trap over wet mud , close to spring-fed pond, *Salix/Betula/Fraxinus* wood on coastal fen. Col RMB and REB, det MCDS (National Museum of Ireland).

Parent's (1927) original description of *S. luteicornis* is based on females. According to Negrobov's (1975) keys *S. luteicornis* is the only palaeartic *Syntormon* species to have yellow antennae, and as such runs down in the first couplet of his key to males and his key to females .

Description of male

Antennae almost entirely yellow, except that the third antennal segment is brownish dorsally and at the tip. Arista 2.3 times as long as third antennal segment. Antennal segment three only slightly longer than deep (Fig.1a). Eyes almost meeting on face below antennae (Fig.1b). Acrostichal bristles uniserial, about 1/3rd as long as dorsocentrals. Legs entirely yellow, including all coxae and tarsi. Metepimeron yellow. All legs simple in both structure and chaetotaxy. Mid femur with a single, weak anteroventral bristle, hardly as long as the maximum width of the femur, toward the base of the femur (Fig.1c). Hind tarsi unmodified. Abdominal tergites yellow, except for brown areas shown shaded in Fig 1d ; these areas are slightly variable . Body length 2.6-3.3 mm.

Our specimens of male *S. luteicornis* have antennae coloured exactly as in Parent's description of the females . The only differences of note between our *S. luteicornis* males and the description of *S. luteicornis* females in Parent (1938) are the point of insertion of the arista which

is a little beyond the mid point of the third segment in the female and subapical in the male; the posterior transverse vein is oblique and equal to two-thirds the length of the apical section of the cubital vein in the female (Parent 1938), vertical and equal to one-third the length of the apical section of the cubital vein in our males of *S. luteicornis*.

Attempts to identify male specimens of *S. luteicornis* using Fonseca's key without other aids are likely to result in the specimens running down to *S. miki*. Fonseca does not specify the black antennae, and mainly black hind tarsi, of *miki* although the latter character could be inferred from his text by an alert reader, who might also notice that *luteicornis* is a distinctly smaller species than *miki* ; that is to say that specimens of *luteicornis* running down erroneously to *miki* would be little more than half the size that Fonseca quotes for the latter. The outer cross-vein is vertical in *miki* in both sexes, according to Parent . Illustrations for *miki* are shown, for comparison with those for *luteicornis*, in Fig. 2 (a-d) .

Fonseca's (1978) keys to males and females of *Syntormon* each require an additional couplet to begin with as follows:-

- | | | | | |
|---|-------------------|-------|---------------------------|--------|
| 0 | Antennae yellow | | <i>luteicornis</i> | Parent |
| | Antennae darkened | | | 1 |

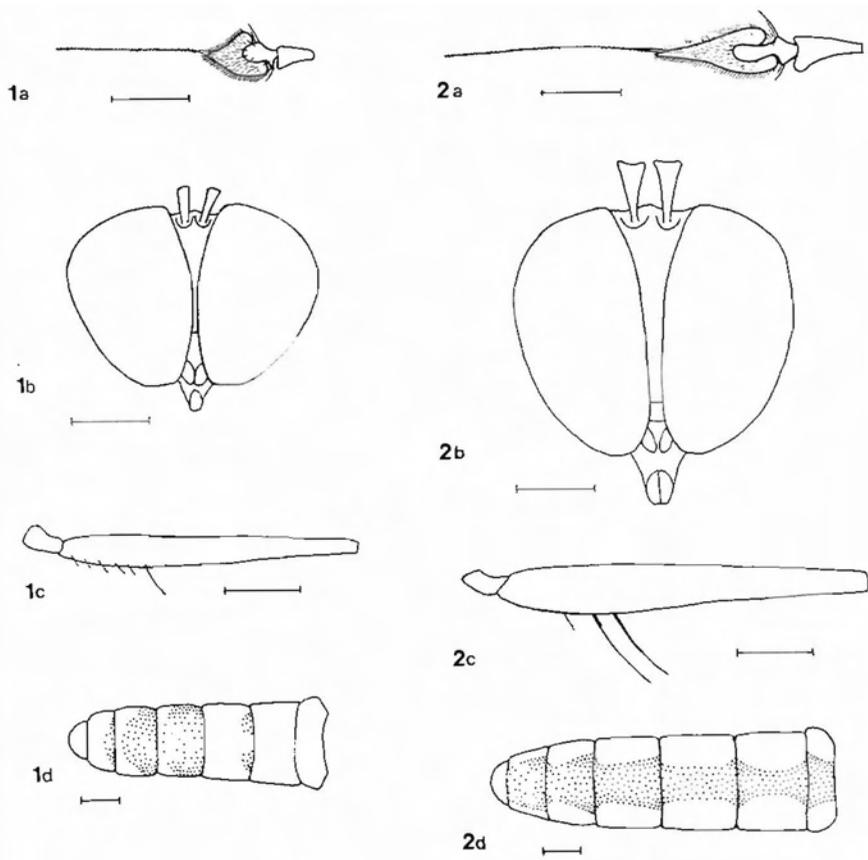


Fig.1 *Syntormon luteicornis*

a) right antenna ; inner side
 b) face
 c) left mid-femur showing
 anteroventrals only
 d) abdomen, dorsal view

Fig.2 *Syntormon miki*

a), b), c), and d) as in Fig. 1

Scale-line 0.25 mm throughout

Acknowledgements

We are grateful to Marc Pollet for information on *S. luteicornis* in Belgium .

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Obozr. 54: 120-129. (in Russian)
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nouveaux ou peu connus. **Enc. ent.**
(B) II , Dipt.4, 45-96.
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Syntormon setosus and *Systemus*
pallidus (Diptera : Dolichopodidae),
insects new to Ireland. **Ir. Nat. J.**,
23 : 92-97.

R. M. and R. E. Blackith, Department of Zoology, Trinity College, Dublin-2, Ireland.
M. C. D. Speight, Research Branch, Wildlife Service, Sidmonton Place, Bray, Co.
Wicklow, Ireland.

A SECOND IRISH RECORD OF *SYNTORMON LUTEICORNIS* PARENT

Since the text on *Syntormon luteicornis* was submitted for publication, this dolichopodid has been found at a second Irish location, as follows:

Waterford: 7-25 July 1990, 4 males, SS104(PT.1), Crough, near Dunhill; malaise trap on bank of stream, disused pasture/fen in sheltered, low-lying valley, c.10km from the sea; coll. and det.MCDS; now in collections Nat.Mus.Irl., Dublin.

The Dunhill locality is in many respects similar to the Murrough, being streamside pasturage near the sea, with areas of fen due to upwelling of water from springs, but there is no dense woodland as at Blackditch Wood. Patches of *Salix* scrub border the stream at Crough, but the malaise trap was in the open, except for a solitary *Ulex* bush. As the proverbial crow flies, Crough is c.130km. from Blackditch Wood, and the two localities are nearly 200km apart round the coast. As at Blackditch Wood, the Dunhill locality has been subject to direct collecting by sweep net, but *S. luteicornis* has only been found in the malaise trap. No females have yet been found in either Wicklow or Waterford. Neither *S. miki* Strobl nor *S. setosus* Parent have been found at Crough.

Martin C.D. Speight

Some less common Tephritidae recently observed in Warwickshire.

John Robbins

Cryptaciura rotundiventris (Fallen). My recent note on this species (Robbins, 1989) was written before I had the opportunity to read the recent Handbook by White (1988). I had not therefore realised how rare it would seem to be, Warwickshire being apparently only the seventh county from which it has ever been recorded in the British Isles. A few further notes may therefore be of some interest. The colony was well established in the middle of a closed-canopy wood, a habitat in which one will not find *Euleia heraclei* (Linn.), which also mines *Angelica*; probably 20-30 mines were noted within easy reach of a footpath. Although Hering (1957) does not distinguish between the mines of the two species the Warwickshire specimens of the mines of *C. rotundiventris* were sufficiently distinct for them to be readily separable from those of *E. heraclei*, while in addition the mining periods are roughly a month later. It would also seem that this is the first British record from *Angelica sylvestris* L.

Oxyna parietina (Linnaeus). White (1988) gives the known ranges as including south-east England, E. Anglia and Yorkshire. Warwickshire lies to the west of this, but on 5th June 1988 I found several specimens at Exhall, just north of Coventry. I am grateful to Dr. B.R. Pitkin of the British Museum (Natural History) for providing the identification.

Paroxyna misella (Loew). White mentions only south-east England and E. Anglia, but from 1983 the characteristic galls of this species in *Artemisia vulgaris* L. have been observed annually in a superficially unpromising piece of country lying between the old Coventry gasworks site and the Keresley colliery! In 1984 I reared a few imagines and also some specimens of the parasite *Pteromalus berylli*, Walker (Hymenoptera, Pteromalidae) from a couple of galls, which each held 5 or 6 puparia. Isolated records of single galls have also been made at Bedworth (4 miles N.) and Brandon (6 miles S-E). The species must be quite local in the county since Peter Cooke, the leading Warwickshire cecidologist, informs me (personal communication) that he has never himself found the galls. I am grateful to Dr. R.R. Askew of Manchester University for identifying the Eulophid parasite (Note added in press: *Paroxyna misella* captured by Mr. M.N. Pugh at Hams Hall in 1987).

Vidalia cornuta (Scop.). This is a very rare species according to White (1988). Back in 1982 Mr. R.W.J. Uffen informed me (*in litt.*) that it had been taken in Warwickshire by J.W. Saunt, but he provided no details of the record. The specimen does not appear to be present in the Saunt collection at the Herbert Art Gallery & Museum, Coventry, and I am wondering if any reader can provide any further information. This record (if genuine) will be additional to those listed by White.

It is not unlikely that these - and possibly other apparently scarce species - will be found in other parts of the Midlands, where the study of Diptera has been limited (for some groups limited to virtually nothing) and whence published records have been few.

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TWO *HERCOSTOMUS* (*GYMNOPTERNUS*) SPECIES, NEW TO GREAT BRITAIN

Marc Pollet

Introduction

Palearctic dolichopodid species belonging to the subgenus *Hercostomus* (*Gymnopternus*) are clearly monophyletic. They can easily be distinguished from other *Hercostomus* species by the general lack of conspicuous ornaments on legs and antennae and the rather simple genital lamellae in the males. They also have in common a group of fine hairs on the metapleura in front of the posterior spiracle (Curran, 1933). The following western European species belong long to it: *H. (G.) assimilis* Staeger, *H. (G.) angustifrons* Staeger, *H. (G.) brevicornis* Staeger, *H. (G.) cupreus*, *H. (G.) aerosus* Fallén, *H. (G.) celer* Meigen and *H. (G.) metallicus* Stannius. Although *Hercostomus chalybeus* Wiedemann does show this last feature too, it is excluded from this subgenus on the basis of other morphological discrepancies. For more information about the complete diagnosis of this subgenus, see Pollet (in press).

Recently I revised the subgenus *Hercostomus* (*Gymnopternus*) including all western European species (Pollet, in press). During this study, systematical problems were raised in the case of *Hercostomus (G.) assimilis*, which I believed consisted of three separate species. A subsequent examination of the male genitalia confirmed my presumption and two new species were described: *H. (G.) silvestris* and *H. (G.) blankaartensis*. On the basis of loaned material from all over Europe, the geographical distribution of the three latter species was also investigated. *H. (G.) assimilis* appeared to be the most widespread, thus far known from 11 countries. Until recently both *H. (G.) blankaartensis* and *H. (G.) silvestris* seemingly did not occur in Great Britain, since the only British material I had seen belonged to *H. (G.) assimilis*. However, a month ago¹. I checked the specimens of *H. (G.) assimilis* from the collections of the Natural History Museum (London), which were kindly sent to me by Dr. Brian Pitkin. Among this material, both new species were found. Furthermore, additional data on these species from other European countries were provided by Dr. H. Schumann (Berlin). In this contribution, for each species a short description of its most important diagnostic characters and additional distribution data, if not included in Pollet (in press), are published. If not mentioned otherwise, all British material recorded is part of the collections of the Natural History Museum (London).

Collectors and collection abbreviations: GHV: G.H. Verrall, JHW: J.H. Wood, LCY: Lt.-Col. Yerbury, LP: L. Parmenter, RC: Roy Crossley, MNB: Museum für Naturkunde der Humboldt-Universität zu Berlin.

1. Paper received February 1990.

Results

Both sexes of *H. (G.) assimilis*, *H. (G.) blankaartensis* and *H. (G.) silvestris* show an entirely bare clypeus, whereas the clypeus in the closely related *H. (G.) aerosus* and *H. (G.) metallicus* is covered with a dense black pubescence. The males of the former three species have a silvery white face and thus are easily recognizable from *H. (G.) aerosus*. They still might be confused with *H. (G.) metallicus*; however, this species is distinctly larger (average wing length over 4.0 mm) and its wing venation shows a clear difference: the proximal part of the postical (4th) vein is more than twice as long as the apical part, which is unique in the pale-legged western European species of this subgenus. The most important diagnostic feature between *H. (G.) assimilis*, *H.(G.) blankaartensis* and *H. (G.) silvestris* are found in the coloration of the legs (both sexes) and the genitalia (males).

***Hercostomus (G.) assimilis* (Staeger, 1842)**

Diagnosis

Tibia III slightly to distinctly infuscated on apical fourth to third. Metatarsus III almost entirely dark, at least darker than proximal part of tibia III. Average total wing length somewhat more than 3 mm. Male genitalia: hypopygium rather slender, genital lamellae (cerci) rather large, quadrat and completely brownish black (very similar to *H. (G.) aerosus*).

Distribution

Widespread in northern and western Europe. Thus far known from Sweden, Poland, Czechoslovakia, Hungary, Denmark, Germany, The Netherlands, Belgium, France, Great Britain, Eire.

Distribution in Great Britain: 2 ♂, Dyfed, Pembury (forest pool), 6.vii.1986 (RC, pers. coll.); 2 ♂, Walberwick (coastal marsh), 11.vi.1985 (RC, pers. coll.); 1 ♂, York (Derwent Ings Nature Reserve), 16.vi.1987 (RC, pers. coll.); 1 ♂, York (Derwent Ings Nature Reserve), 25.vii.1987 (RC, pers. coll.); 1 ♂, Chippenham, 15.vi.1894 (GHV); 1 ♀, Wicken, 9.vi.1908 (GHV); 1 ♂, Upware, 5.vii.1875 (GHV); 1 ♂, Upware, 11.vii.1875 (GHV); 1 ♀, Wicken, 27.vi.1903 (GHV); 1 ♀, Cambs (Wicken Fen), 18.vi.1950 (LP).

***Hercostomus (G.) blankaartensis* Pollet, in press**

Diagnosis

Femora and tibiae I, II and III entirely pale yellow, tarsi only feebly infuscated. Total wing length approximately 3.7 mm. Male genitalia: hypopygium rather slender, genital lamellae remarkably small, quadrat and ochreous yellow.

Distribution

Thus far known from Hungary, Belgium, The Netherlands, Great Britain, France and Corsica.

Additional data. Great Britain: 1 ♂, Cambs (Chippenham Fen), 1.vii.1951 (LP); 2 ♂, Cambs (Chippenham Fen), 27.vi.1965 (LP); 1 ♂, Cambs (Chippenham Fen), 1.vii.1951 (LP); 1 ♂, Cambs (Chippenham Fen), 18.vii.1965 (LP). New to the British fauna. Corsica: 1 ♂, labelled 'SS502 vi' (MNB).

Hercostomus (G.) silvestris Poilet, in press

Diagnosis

Femur I largely infuscated dorsally, femora II and III only feebly infuscated dorsally. Average total wing length somewhat more than 3 mm. Male genitalia: hypopygium remarkably stout, genital lamellae relatively small, ellipsoid and brown with paler base.

Distribution

Thus far known from Czechoslovakia, Hungary, Belgium, France and Great Britain.

Additional data. Great Britain: 1 ♂, Porthcawl, 2vi.1906 (LCY); 1 ♂, Porthcawl, 12vi.1906 (LCY); 1 ♂, Porthcawl, 4vii.1906 (LCY); 1 ♂, Yorkshire (marsh), 5vi.1909 (JHW). New to the British fauna. Hungary: 1 ♂, freshly emerged specimen labelled '61553 v' (MNB).

So far, in Great Britain *H. (G.) blankaartensis* and *H. (G.) silvestris* are recorded from one single and two sites respectively. Although both species demonstrate a very specific habitat selection, they are not as rare as generally thought and can readily be found in suitable habitats. In recent years I sampled a large number of sites in Belgium for dolichopodid flies. My primary aim was to determine the composition of the dolichopodid fauna and certainly not to raise the number of localities for these particular species. These investigations yielded 9 localities for *H. (G.) assimilis*, 4 for *H. (G.) blankaartensis* and 12 for *H. (G.) silvestris*, of which the majority are situated in the province of West Flanders. It is evident that, while taking into account their stenotopic occurrence, one has to look for them in the right places.

In Belgium, *H. (G.) assimilis* has mainly been found in marshland habitats with a well developed herb or reed vegetation and almost always in the vicinity of open water. The largest population was encountered in De Westhoek Nature Reserve at De Panne (Fig. 1). The habitat was a strongly developed *Carex*-vegetation patch at the edge of a small pond within the coastal dunes. *H. (G.) blankaartensis* roughly shows the same habitat selection but seems to be considerably rarer. At least in Belgium this species appears to be confined to reedmarshes. Thus far, the largest population was established in De Blankaart Nature Reserve at Woumen (Fig. 1), which consists of a large lake with vast bordering reedmarshes. In sharp contrast to its former congeners, *H. (G.) silvestris* has only been reported from humid woodland habitats.

It was captured in largest numbers in Wijnendalebos at Ichtegem-Torhout and in De Mandelhoek Nature Reserve at Ingelmunster. Both sites are situated in the loamy region of Flanders (Belgium) (Fig. 1). In woodland sites on a sandy soil, this species has always been collected in very small numbers only. It can be expected that in the future many more sites in Great Britain and other European countries will be found where these species occur and thrive.

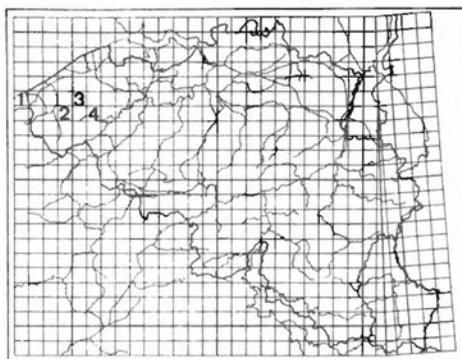


Figure 1. Location in Belgium of large populations of *H. (G.) assimilis* (1), *H. (G.) blankaartensis* (2) and *H. (G.) silvestris* (3,4). 1, De Westhoek Nature Reserve (De Panne); 2, De Blankaart Nature Reserve (Woumen); 3, Wijnendalebos (Ichtegem-Torhout); 4, De Mandelhoek Nature Reserve (Ingelmunster).

Acknowledgements

I am much indebted to Mr. R. Crossley (York), Dr. B. Pitkin (London) and Dr. H. Schumann for the loan of dipteran material.

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PROVISIONAL DISTRIBUTION MAPS FOR LEOPOLDIUS SPECIES IN BRITAIN
(DIPTERA: CONOPIDAE), WITH SOME COMMENTS ON THE KNOWN BIOLOGY

David K. Clements

In a recent paper (Clements, 1989) I reported two new records for the rare conopid *Leopoldius brevisrostris* Germar, and provided illustrations to assist in separating this species from the very similar *L. signatus* (Wiedemann), a more frequently recorded species. In preparing that article, I drew together and summarised all of the records known to me from the Conopid Recording Scheme (CRS) and from the literature. Subsequently I have prepared the accompanying distribution maps (figures 1 and 2), which include all of the records submitted to the recording scheme up until April of 1990.

Only two species of *Leopoldius* have been recorded in Britain, although there are a number of superficially similar, additional species on the continent, some of which could conceivably occur here also. Both of the British species are presently assumed to be parasitoids of social wasps, probably of the genus *Vespula*. At present, however, firm host records and larval descriptions for both species appear to be entirely lacking. The continental species *L. coronatus* (Rondani) and *L. diadematus* Rond. have been reared from *Vespula germanica* (F.) and the former has also been observed ovipositing upon *V. vulgaris* (L.) and *Polistes gallicus* (L.) (Raw, 1968).

Leopoldius signatus is one of the rarer conopids, with about 100 records presently contained in the CRS, although it is probably under-recorded. It is a late-flying species, peaking in September (figure 3) and most frequently taken on the leaves and flowers of ivy (*Hedera helix*), usually in the company of *Vespula* wasps. Ivy is particularly attractive to wasps (and many other flower-feeding insects) since it flowers towards the end of the summer season when other nectar-sources have disappeared, and sunlit situations are particularly favoured. 46% of the *L. signatus* records held in the CRS indicate this mode of capture. Other capture situations include the honeydew-covered leaves of sycamore (*Acer pseudoplatanus*), in the company of *Vespula* wasps, and it has turned up several times in Malaise traps and water traps, including one at the top of a pole some 6 metres in height (Ball, 1985). Recorded habitats include woodland edges, hedges and walls, heathland, parkland, grassland, gardens, a churchyard and a golf course, with no strong preference indicated.

The late summer peak of *L. signatus* adults ties-in well with the usual flight period of *Vespula vulgaris* and *V. germanicus* workers, the other vespids (with the exception of the hornet *Vespa crabro* L.) having more or less finished by the beginning of September (Spradbery, 1973). It seems likely that the *L. signatus* larva completes its development in the few short weeks before the workers begin to die, around the end of October, over-wintering as a puparium inside the dead wasp's husk.

The recent distribution pattern of *L. signatus* (figure 1) shows a moderately strong southern and eastern bias, with a thinner scattering of more widespread records reaching as far afield as Northumberland, Derbyshire, Sheffield and north Wales. There are also older records from Pembrokeshire (1948) and west Cornwall (1939), which one could reasonably expect to see re-confirmed.

Leopoldius breviostris is a more puzzling species. A number of specimens were taken around the time of its addition to the British list (Wainwright, 1938), from a scatter of sites in the southern half of England. However, with the exception of a single specimen taken in Hampshire in 1952, there appear to have been no further records until the two most recent captures in Gloucestershire (1983) and London (1987) (figure 2). It is tempting to believe that the species may have been overlooked in collections as *L. signatus*, since there is considerable variation in the supposedly characteristic abdominal and other markings previously used for identification (see Clements, *loc.cit.*).

On the limited sample available (just 9 records!) the flight period of *L. breviostris* appears to be somewhat earlier than that of *L. signatus* (see figure 4), suggesting a peak in July–August. This could conceivably allow utilisation of some of the earlier-flying vespids as hosts, assuming that the host preference is similar to the rest of the genus.

L. breviostris seems to show a clear habitat preference for woodland, and has not to date been taken in the usual ivy-associated mode of *L. signatus*. It has, however, been taken using a water trap.

Other Central European Leopoldius species

As mentioned above, there are a number of additional *Leopoldius* species which occur on the continent, and which are very similar in appearance to the known British species. Perhaps the most likely of these additional species to occur here would be either *L. diadematus* or *L. coronatus*. These species are distinguished from *L. signatus* and *L. breviostris* in that the British species both have the black coloration of the frons extended right down to the level of the antennae, whereas in the other two there is a more-or-less distinct band of yellow across the frons, just above the antennae. A fifth species, *L. calceatus* (Rond.) is less likely to occur here, and would probably be fairly readily recognised as being "different". It has the front coxae black, a strong yellowish band along the costal margin of the wing, and the abdomen has far less yellow patterning than in the other central European species. Further details are given by Chvála (1961).

Figure 1. Distribution of *L. signatus*

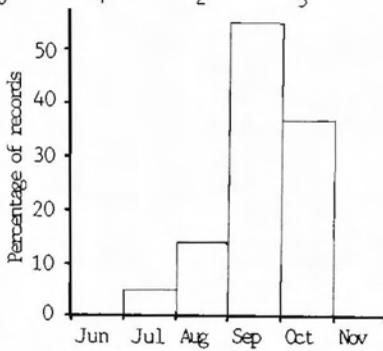
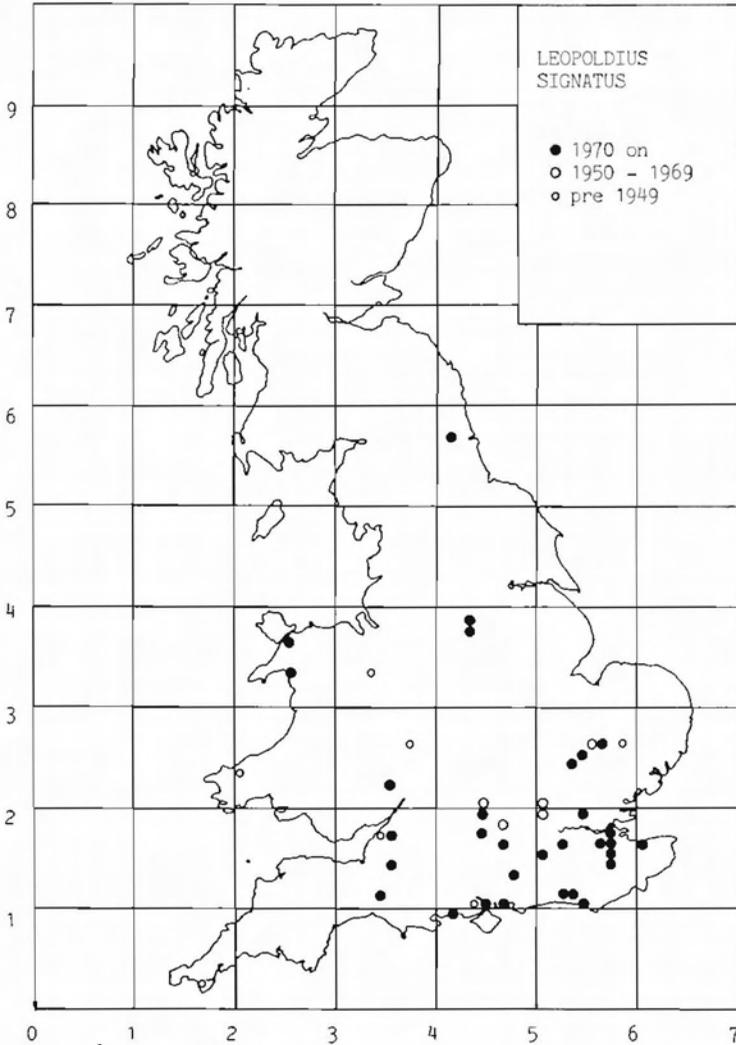


Fig. 3. Flight Period of *L. signatus* (84 records)

Figure 2. Distribution of *L. brevirostris*

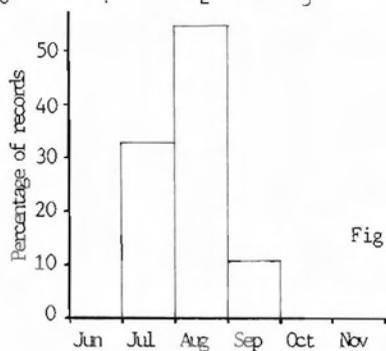
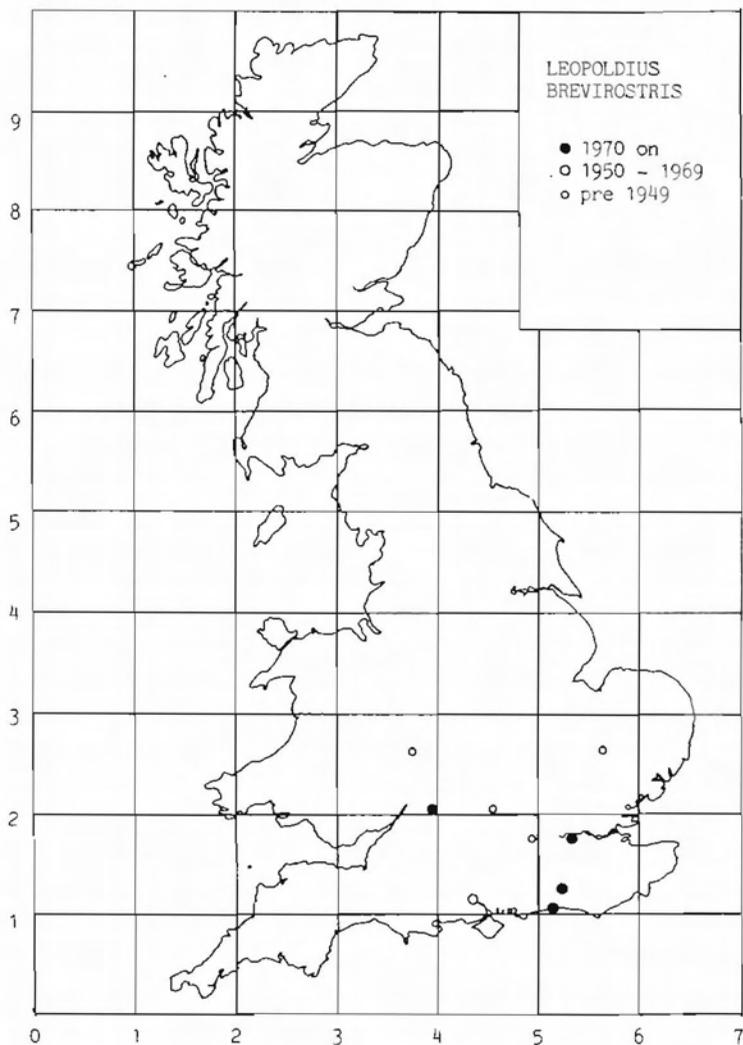


Fig. 4. Flight Period of *L. brevirostris* (9 records)

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Note added in press:

Since preparing this article, I have been made aware of two further captures of *Leopoldius brevirostris*, both taken during July of this year. Full capture details will appear elsewhere, but in the meantime the sources concerned have kindly permitted me to add the records to Figure 2 above, and to append brief details here. Remarkably, both specimens were taken whilst using mercury vapour moth-traps, one in woodland near Worthing, in Sussex, and one at the edge of Ken Wood, Middlesex. The capture details otherwise fall within the parameters set out herewith.

My thanks to Mark Parsons of the Nature Conservancy Council, Peterborough, and to Colin Plant of the Passmore Edwards Museum for forwarding these records.

David Clements, Conopid Recording Scheme Organiser, 9 Cecily Hill, Cirencester, Glos. GL7 2EF.

Stridulating in *Solva marginata* Melgen (Diptera, Xylomyidae)

C. M. Drake

While we were surveying an area of fen in the Kennet Valley near Newbury, Berkshire, in July 1989, Alan Stubbs pointed out a number of *Solva marginata* sitting on the foliage of a lime tree. They had, no doubt, bred from an adjacent fallen aspen. The flies flitted from leaf to leaf, settling for a few seconds before moving on, in a manner reminiscent of *Xylota* hoverflies but less restless. I noticed that they produced faint nasal chirps lasting perhaps a quarter of a second and it soon became apparent that there was a definite pattern attached to this behaviour. The flies made a single chirp before almost immediately flying to another leaf where they settled for a few seconds before repeating the call. Most of their activity and all the chirping stopped when the sun went behind the clouds. The noise was accompanied by their wings vibrating slightly when folded across the abdomen in their normal resting position. The frequency was presumably high since Alan, who is older and more ear-worn than I, could not hear them from where we stood at about a metre from the flies. I could not determine the sex of the calling individuals nor detect any obvious interaction between them but their behaviour was so distinct and repeated by several flies that I felt that it was unlikely to be functionless.

I examined the wings and abdomen of set specimens for any sound-producing mechanisms. There are no obvious modifications of the wings whose venation at the root of the wings is similar to that in the closely related families Stratiomyidae and Rhagionidae. Many veins have short setae above and below. The first tergite is unusual among Brachycera, comprising a large semi-circular membrane reaching almost to the hind margin and leaving only the posterior corners sclerotised. This is one of several characters that Nagatomi & Tanaka (1971) use to separate *Solva* from *Xylomya* (= *Macroceromus*), and is the same in both sexes. The first two tergites are fused and have a series of ridges along the junction similar to those found in some solitary wasps. Sound production may involve some of these features, for example, the setae on the veins may rub against each other or against the ridges along the junction of the first two tergites, and the membrane may act as a resonator. Further observation on this and other species of *Solva* may determine whether these suggestions are plausible.

Sound producing mechanisms and the behavioural role of sound are well documented for a wide range of insects. The significance of the present observation is that deliberately produced sound with a demonstrable social function has rarely been recorded in Diptera (Imms 1957, Haskell 1961). The flight hum of such flies as mosquitoes, eristalinid hoverflies and tabanids has secondarily acquired a social function but they would probably hum similarly even if they had not found this byproduct of flight socially useful. Monro (1953), working on the trypetid *Dacus tyroni*,

described a true stridulating mechanism, found only in the males, consisting of a comb of setae on the third tergite against which the anal-cubital area of the wings rub to produce a burst of sound that female flies respond to. The related *D. cacuminatus* produces a similar call (Myers, 1952) and some other trypetids are also thought to stridulate. However, there seem to be no other reports of primary sound producing mechanisms to span the broad evolutionary gulf between *Solva marginata* and the Trypetidae.

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Intersexual Forms of *Hilara monedula* Coll. (Empididae).

Adrian R. Plant.

The front metatarsal segments of male *Hilara monedula* Coll. are typically swollen with a mean maximum length to width ratio of 3.38 (range=3.16-3.75, SD=0.15, n=20) while those of females are elongate-cylindrical (mean ratio 7.61, range=6.32-10.08, SD=1.41, n=24). On 26 May 1989 and 31 May 1990 at Hensol Forest lake, Glamorgan (VC 41, ST/043763) I caught a total of five specimens in which the front metatarsal segment of one leg was swollen but that of the other was elongate-cylindrical. The length/width ratios for the right and left legs were respectively:- 5.22, 2.94; **3.68**, **4.67**; 5.04, 4.00; 3.50, 5.79; 5.26, 3.24. (c.f. Fig. 1). All the specimens were female as assessed by examination of the genitalia and all exhibited additional bilateral asymmetry in that the bristles on the abdomen and legs on the "male" side were somewhat stronger than on the "female" side.

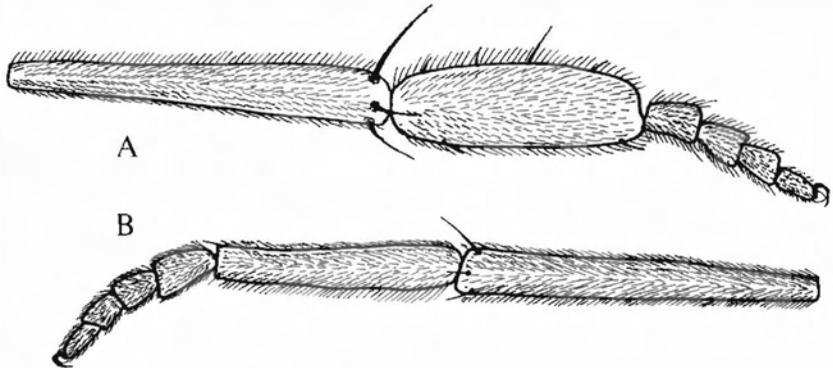


Fig. 1. Front tibiae and tarsi of *Hilara monedula* Intersex, posterior aspect
A. right leg
B. left leg

Collin (1961) reported a specimen of *H. monedula* from Snailwell, Cambridgeshire which had the front legs of a male but was otherwise a typical female. Collin also reported an intersexual form of *H. germanica* Engel. from Norway which had abnormally reduced male genitalia. The five intersexual females represent 5.3% of the 95 females in my collection, which is an unexpectedly high incidence of this abnormality. None of the 51 males examined were atypical.

I am unaware of any detailed explanation of intersexuality in Diptera but it is generally thought to arise through failure of the sex-determining mechanism of genes or through abnormal developmental (e.g. hormonal) influences. The mild weather of 1989 and 1990 may have been responsible for the huge numbers of this fly swarming over the lake when the intersexual specimens were collected. It is tempting to speculate that the occurrence of intersexes in *H. monedula* is an adaptive mechanism in which a developmental influence is switched on by some factor operating when the population density is high resulting in the production of (presumably sterile) intersexes, thereby limiting further increase in the population.

Reference

Collin, J.E. (1961) **British Flies 6: Empididae**. Cambridge 782 pp.

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