Sciomyzidae (Diptera)

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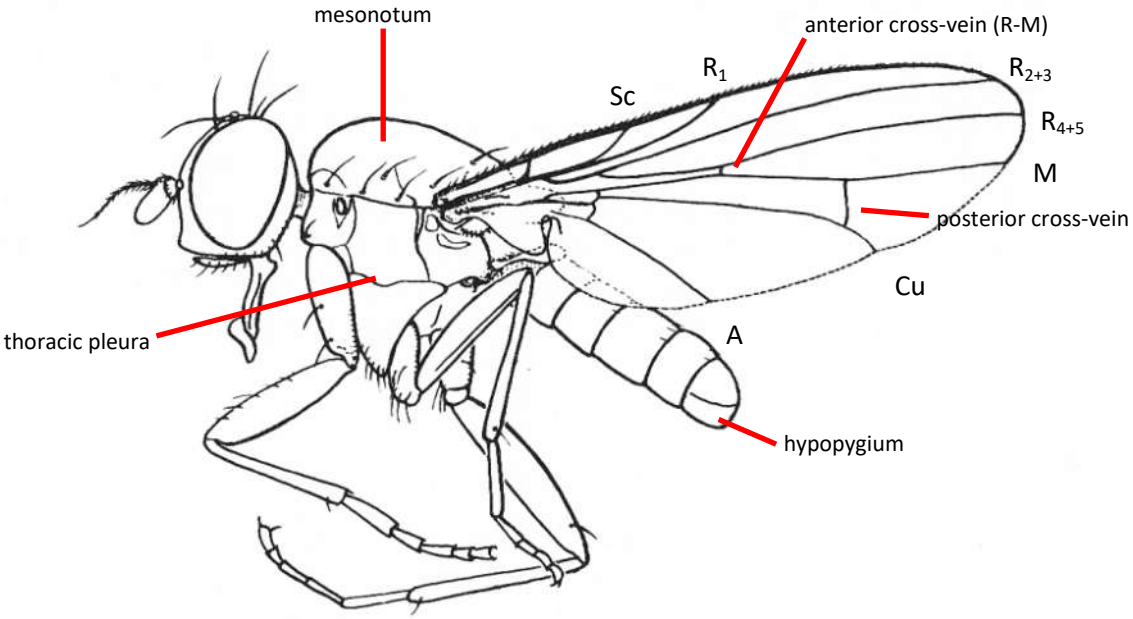
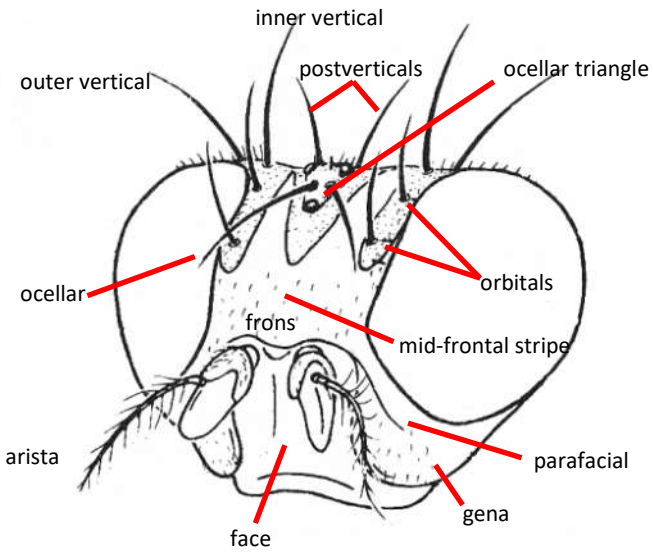
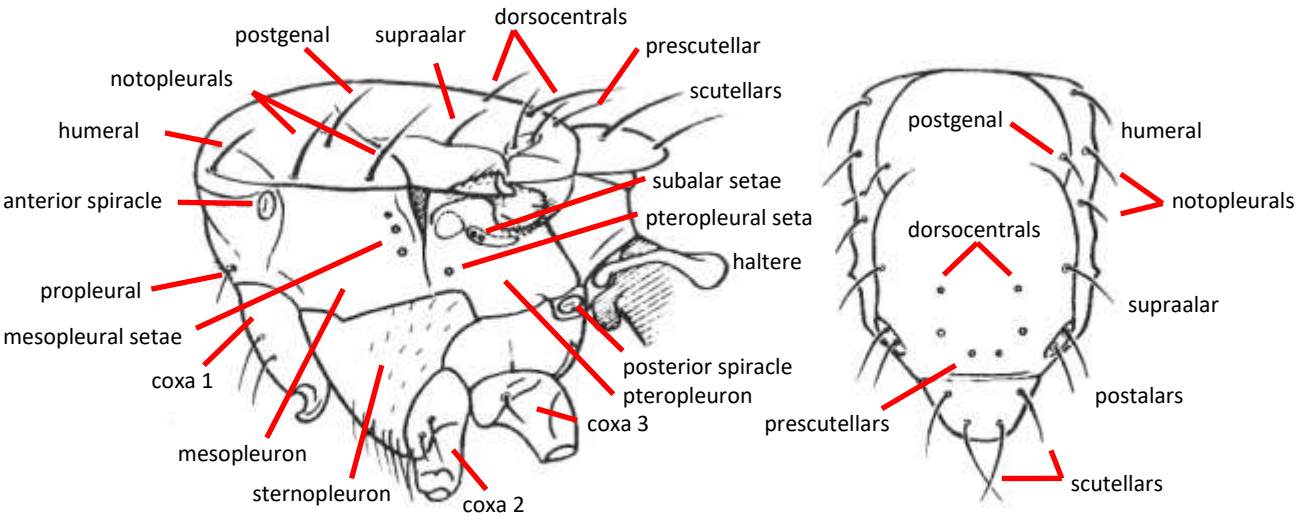
Contents

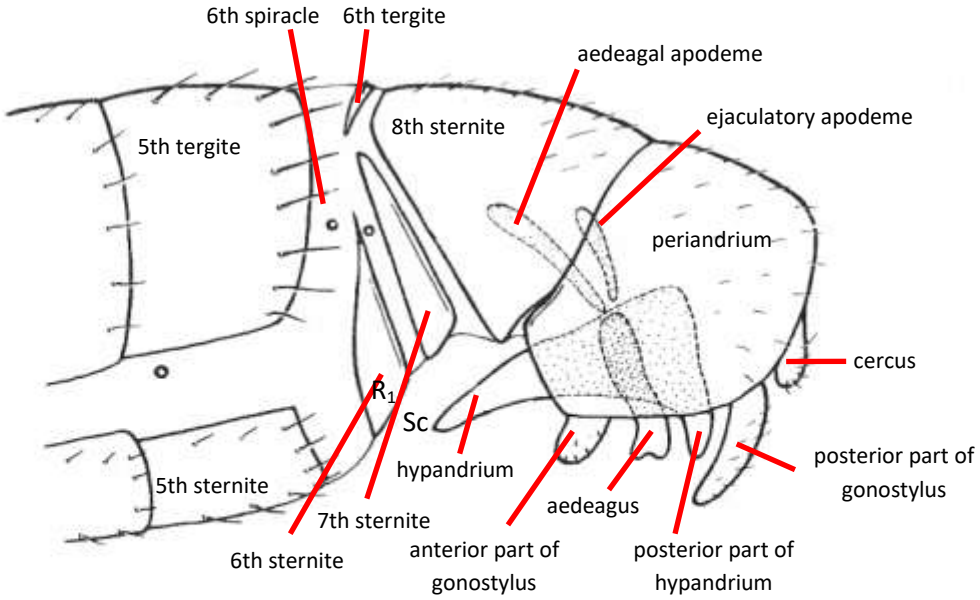
Introduction

The keys are based on Rozkošný (1984) in part, but updated to cover all British species (i.e. with *Pherbellia knutsoni* included) and to incorporate illustrations in the couplets. *Limnia* and *Tetanocera* follow McLean (2010) and *Sciomyza*, Gittings & Speight (2010). Names follow Chandler (1998) updated to Oct 2016. Couplets leading to species which have not (yet!) been recorded in Britain are shown in dark red type and one species (*Pherbellia stackelbergi*) recorded only from Ireland in blue. Descriptions of the species largely come from Rozkošný (1984, 1987), the distribution outside Britain and biology from Speight & Knutson (2012), the British distribution from McLean (2010) (updated with respect to the distribution maps) and the adult flight periods from the Recording Scheme data.





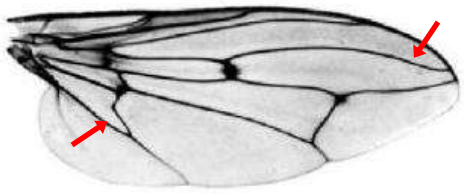

postgenal
supraalar
dorsocentrals
prescutellar
notopleurals
scutellars
humeral
subalar setae
anterior spiracle
pteropleural seta
haltere
propleural
mesopleural setae
coxa 1
posterior spiracle
pteropleuron
coxa 3
mesopleuron
sternopleuron
coxa 2
postgenal
humeral
notopleurals
dorsocentrals
supraalar
postalars
prescutellars
scutellars


6th spiracle
6th tergite
aedeagal apodeme
8th sternite
ejaculatory apodeme
5th tergite
periandrium
cercus
R1
Sc
hypandrium
posterior part of
gonostylus
5th sternite
7th sternite
aedeagus
6th sternite
anterior part of
gonostylus
posterior part of
hypandrium

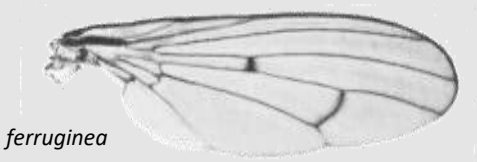
Keys

Key to genera

1. Veins R_{4+5} and M strongly converging at apex of wing; anal cell with a triangular extension at anal vein (Salticellinae) ..... *Salticella fasciata* (p.34)

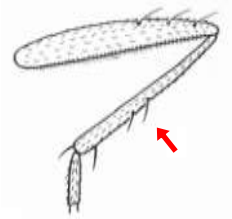


– Veins R_{4+5} and M parallel or only slightly converging; anal cell without a triangular extension ..... 2.



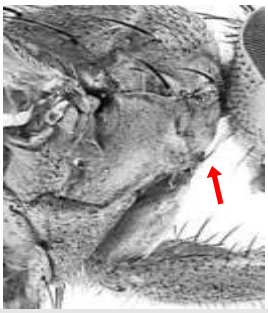
Tetanocera ferruginea

2. Middle and hind tibiae with median anterodorsal and posterodorsal setae ..... *Pelidnoptera* (p.16)

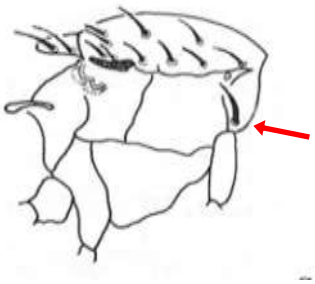


– Middle and hind tibiae without median anterodorsal and posterodorsal setae ..... 3.

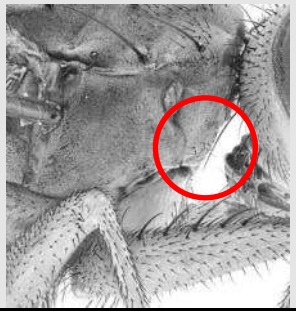
3. Propleuron with a distinct seta above base of fore coxa; if propleural bristle short or indistinct, then anal vein not reaching posterior margin of wing (Sciomyzini) ..... 4.



Pherbellia ventralis

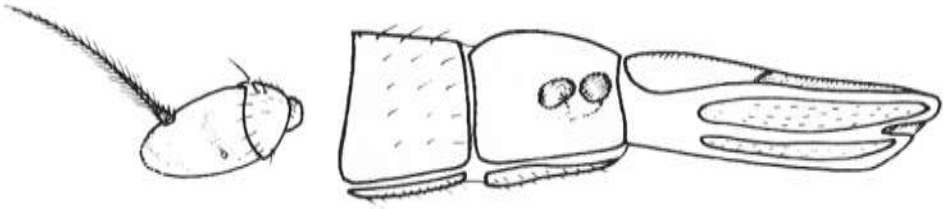


– Propleuron without a seta above base of fore coxa, but often with several fine hairs; anal vein reaching posterior margin of wing (Tetanocerini) ..... 9.



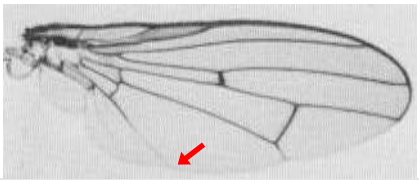
Tetanocera ferruginea

4. Arista subapical; female terminalia modified into an elongated and flattened ovipositor ..... *Tetanura pallidiventris* (p.82)

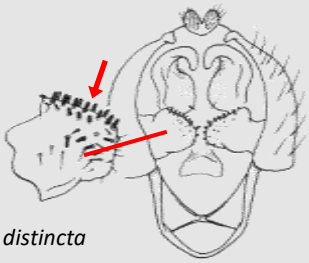


– Arista basal or subbasal; female terminalia not modified into an elongated and flattened ovipositor ..... 5.

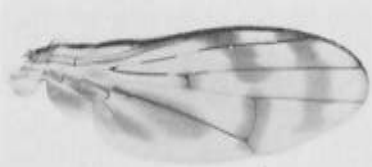
5. Anal vein reaching posterior margin of wing; anterior parts of male gonostyli without thickened subcylindrical setae ..... 6.



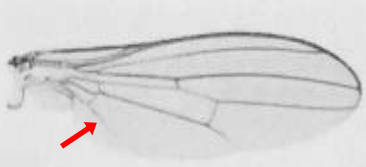
– Anal vein not reaching posterior margin of wing; anterior parts of male gonostyli with thickened subcylindrical setae ..... *Colobaea* (p.13)



C. distincta



C. bifasciella



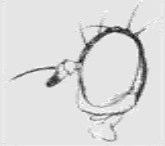
C. distincta

6. Fore tibia with only one preapical seta ..... 7.

– Fore tibia with two preapical setae ..... *Sciomyza* (p.23)

7. Frons mainly pruinose; body never shining black; cheeks usually broad ..... 8.

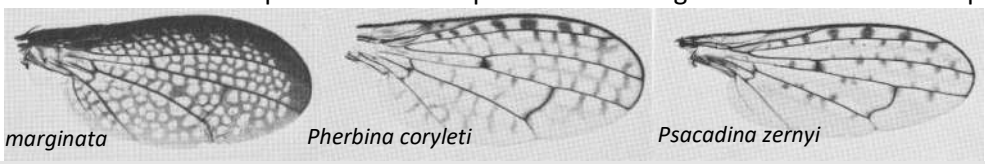
– Frons entirely shining; body mainly shining black or black and yellow: cheeks narrow ..... *Pteromicra* (p.22)



8. One pair of orbital bristles; mesopleuron with fine hairs over most of surface; prosternum usually with 1-2 hairs each side ..... *Ditaeniella grisescens* (p. 43)

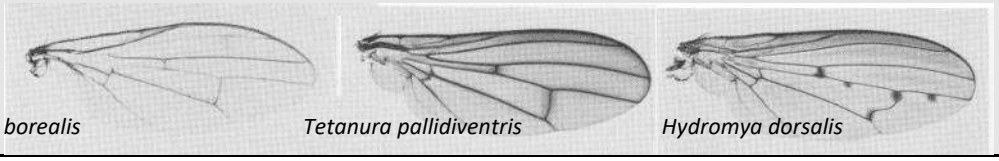
– Two pairs of orbital bristles; mesopleuron with a posterior row of short bristles or bare; prosternum always bare ..... *Pherbellia* (p.16)

9. Wings with a distinct reticulate pattern or with a pattern consisting of numerous blackish spots ... 10.



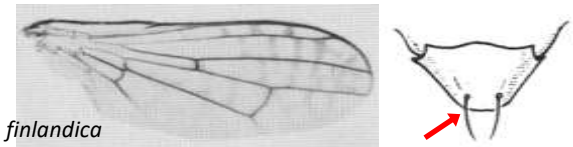
Coremacera marginata *Pherbina coryleti* *Psacadina zernyi*

– Wings without a reticulate pattern, at most with a darkened costal margin and infuscated cross-veins or with several isolated dark spots ..... 17.



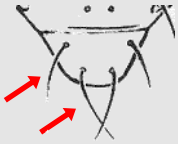
Ectinocera borealis *Tetanura pallidiventris* *Hydromya dorsalis*

10. Scutellum with one pair of setae; wing pattern as illustrated ..... *Dichetophora* (p.14)

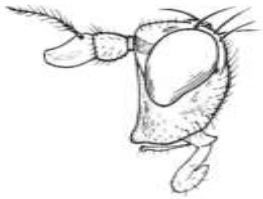


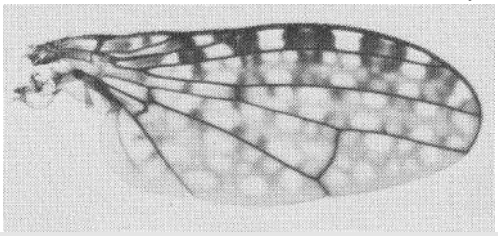
D. finlandica

– Scutellum with two pairs of setae ..... 11.

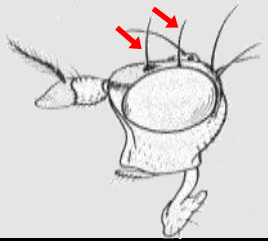


11. Only one pair of orbital setae; wing pattern as illustrated ..... *Dictya umbrarum* (p.95)





– Two pairs of orbital setae; wing pattern different ..... 12.

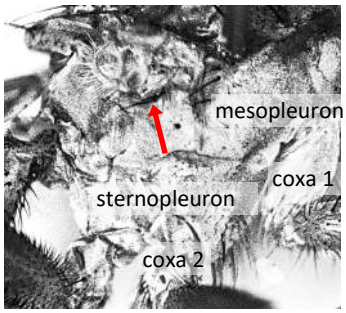


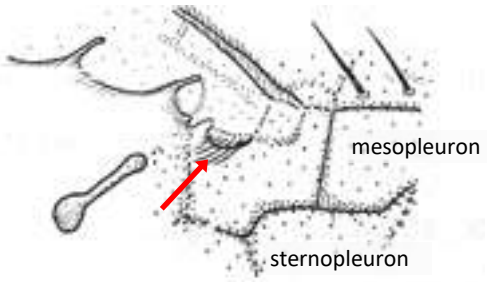
12. Mesopleuron and pteropleuron haired and/or with setae; inner posterior margin of hind coxa with hairs ..... 13.

– Mesopleuron and pteropleuron bare; inner posterior margin of hind coxa without hairs ..... 16.

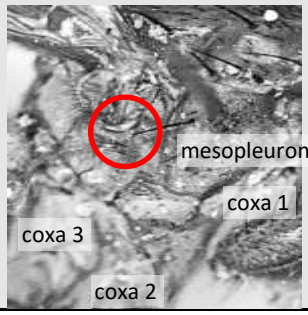
13. Subalar setae present ..... 14.

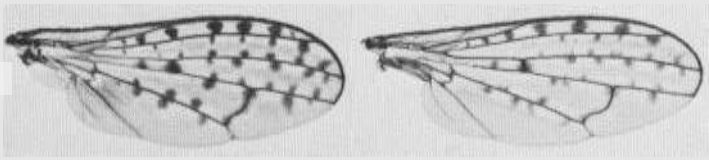
Pherbina coryleti





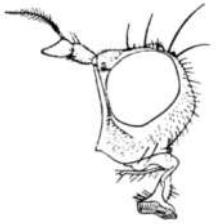
– Subalar setae absent; wing pattern as illustrated ..... *Psacadina* (p.21)



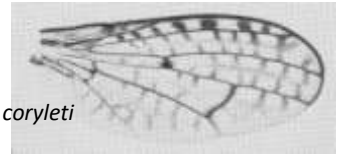


P. verbekei *P. zernyi*

14. Mesopleuron and pteropleuron with setae in addition to hairs; prosternum bare; wing pattern as illustrated ..... *Pherbina coryleti* (p.114)

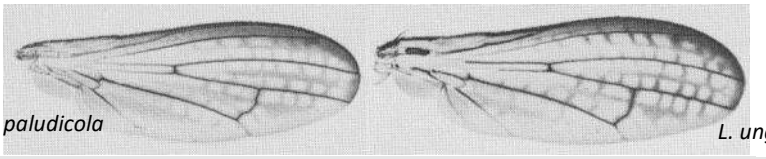


P. coryleti

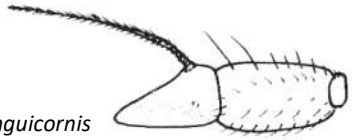


– Mesopleuron and pteropleuron with only hairs; prosternum haired or at least with one hair on each side ..... 15.

15. Arista with short and whitish hairs; mesonotum with longitudinal stripes; wing pattern as illustrated ..... *Limnia* (p.15)

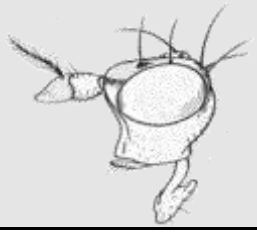


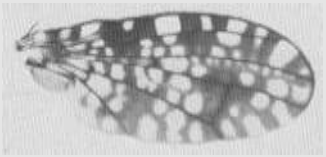
L. paludicola



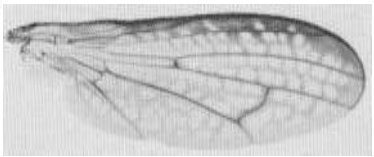
L. unguicornis

– Arista with long black hairs; mesonotum with rounded brown spots; wing pattern as illustrated ..... *Trypetoptera punctulata* (p.142)

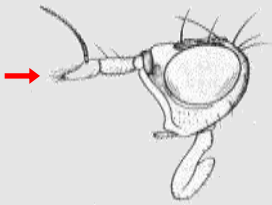


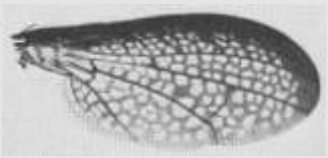


16. Third antennal segment without a tuft of long black hairs at tip; wing pattern as illustrated ..... *Euthycera fumigata* (p.103)



– Third antennal segment with a tuft of long black hairs at tip; wing pattern as illustrated ..... *Coremacera marginata* (p.91)



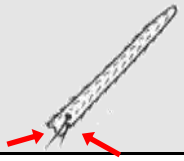


17. Ocellar setae absent; scutellum with one pair of setae; 2nd antennal segment elongate, rod-like ..... *Sepedon* (p.23)

– Ocellar setae present; scutellum with two pairs of setae; 2nd antennal segment stout, not rod-like ..... 18.

18. Hind tibia with one preapical seta ..... 19.

– Hind tibia with two preapical setae ..... 24.

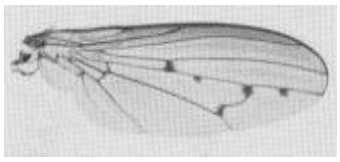


19. Mesopleuron and pteropleuron bare; inner posterior margin of hind coxa without hairs ..... 20.
– Mesopleuron and pteropleuron haired; inner posterior margin of hind coxa with hairs ..... 23.

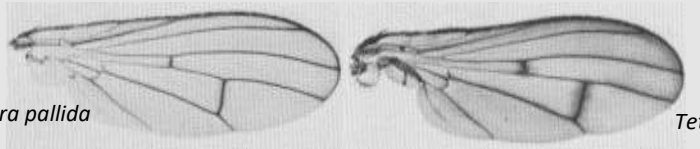
20. Third antennal segment elongated, about three times as long as second segment; only one postalar seta; body mainly black ..... *Ectinocera borealis* (p.97)

– Third antennal segment short, at most twice as long as second segment; two postalar setae; body brown, greyish or yellowish ..... 21.

21. Wings with 5-7 dark spots; arista only pubescent; sternum 4 in male with a pair of cylindrical processes ..... *Hydromya dorsalis* (p.104)



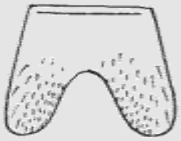
– Wings without dark spots, at most cross-veins infuscated; arista moderately to long haired; sternum 4 in male without cylindrical processes ..... 22.



Renocera pallida *Tetanocera freyi*

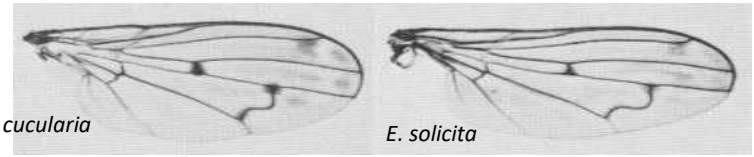
22. Middle femora with an anterior seta near middle; mid-frontal stripe indistinct; sternum 5 in male simple ..... *Tetanocera* (p.24)
– Middle femora without an anterior seta near middle; if this seta present, then dark mid-frontal stripe well-developed; sternum 5 in male with a posterior incision or tubercles ..... *Renocera* (p.22)

male 5th sternum:
R. pallida

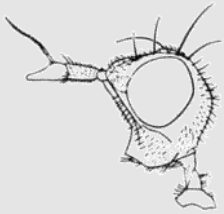


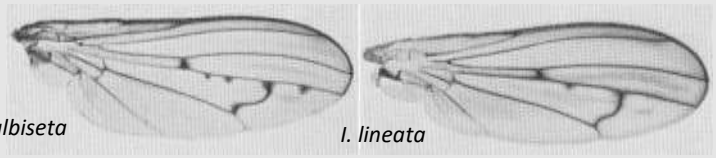
R. striata

23. Subalar setae absent (see illustrations in couplet 13.); posterior cross-vein almost rectangularly curved in upper half ..... *Elgiva* (p.14)

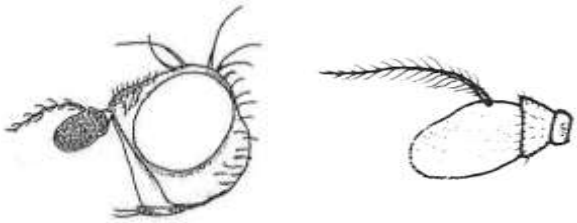


– Subalar setae present; posterior cross-vein only bow-shaped in upper half ..... *Ilione* (p.15)

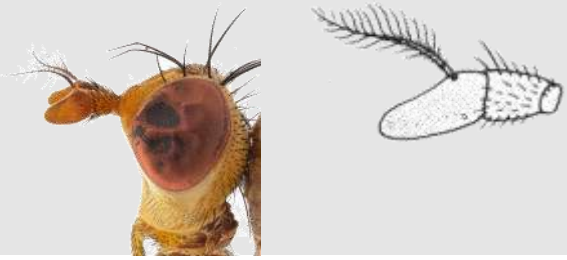




24. Cheeks not wider than third antennal segment; second antennal segment at most only one-third as long as third segment .....*Anticheta* (p.12)

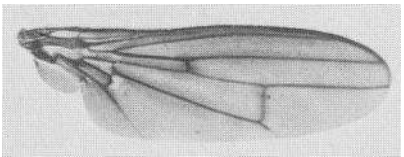


– Cheeks distinctly wider than third antennal segment; second antennal segment more than one-third as long as third segment ..... *Tetanocera* (p.24)



Key to species of *Anticheta*

1. Only one pair of dorsocentral setae and one pair of postalar setae; wings narrow, shorter than abdomen ..... *brevipennis* (p.88)



– Two pairs of dorsocentral and postalar setae, wings not narrow, longer than abdomen ..... 2.

2.	Only one orbital seta on each side; frontal band velvety black except for the shining black mid-frontal stripe; black arista strikingly thickened in basal third ..... *atriseta* (p.87)
–	Two orbital setae on each side; frontal band dull yellow to reddish-brown except for the shining mid-frontal stripe; arista not strikingly thickened in basal third..... 3.

3.	Thorax and abdomen yellow to reddish-brown ..... *analis* (p.85)
–	Thorax and abdomen black. Third antennal segment darkened only at upper margin; legs mainly reddish-yellow, only fore legs darkened .....*obliviosa* (p.90)

Key to species of *Colobaea*

1.	Ground-colour of mesonotum yellowish-brown; wing with two transverse dark stripes .....*bifasciella* p.36

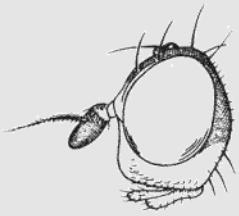
	Ground-colour of mesonotum black; wing without dark stripes ..... 2.

2.	Propleuron and at least apart of mesopleuron yellow ..... 3.
	Propleuron and mesopleuron black like rest of thorax ..... 4.

3.	Upper margin of mesopleuron with a complete dark subnotopleural stripe ..... *pectoralis* (p.39)
	Subnotopleural stripe reduced to a round black spot below anterior notopleural area ..... *punctata* (p.41)

4. Third antennal segment largely white at base; arista white and with whitish hairs; frons entirely black ..... *distincta* (p.38)

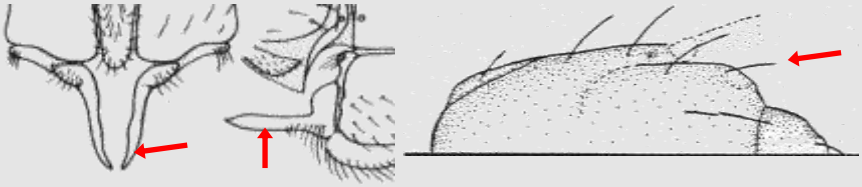
Third antennal segment, including arista, completely black; anterior margin of frons extensively yellow ..... *nigroaristata* (non-British)



Key to species of *Dichetophora*

1. Two postalar setae; gonostyli of male swollen in apical half ..... *obliterata* (p.94)

– Only one postalar seta; gonostyli of male slender, not swollen in apical half ..... *finlandica* (p.93)



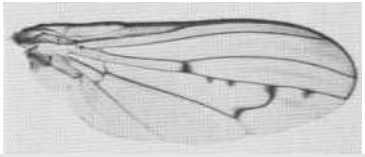
Key to species of *Elgiva*

1. Thorax bluish-grey; mesopleuron with one strong seta ..... *cucularia* (p.100)

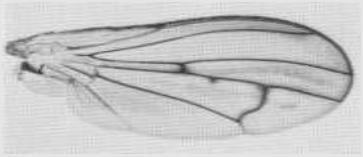
– Thorax yellowish-brown; mesopleuron only haired, without a strong seta. Fore femora with strong antero- and posteroventral setae in apical half .....*solicita* (p.101)

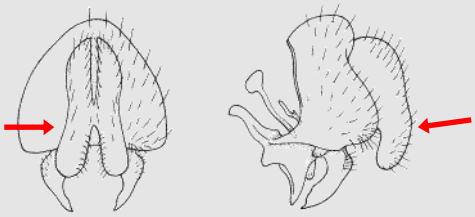
Key to species of *Ilione*

1. Prosternum bare; wing usually with 5 rounded spots on anterior cross-vein, on vein M and at both ends of posterior cross-vein ..... *albiseta* (p.107)



– Prosternum haired; only one isolated rounded spot on vein M, the two cross-veins darkened; with dark longitudinal streaks between veins. Cerci in males markedly swollen and exposed ..... *lineata* (p.108)

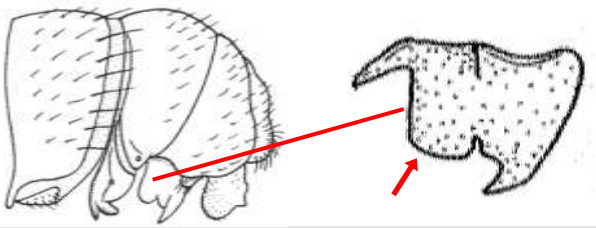




Key to species of *Limnia*

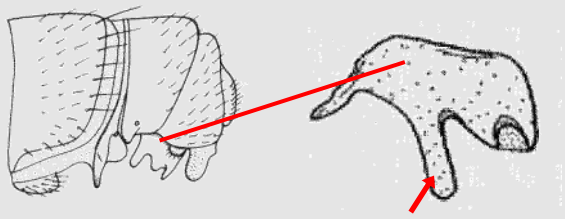
1. Anterior process of hypandrium blunt and rounded, hardly separated; median stripe on female mesonotum uniformly brown ..... *paludicola* (p.110)

♀



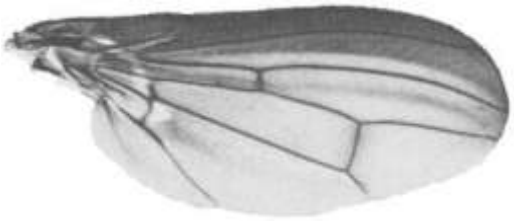
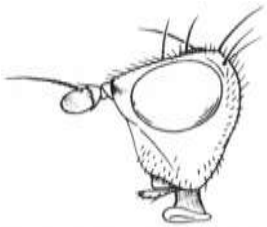
– Anterior process of hypandrium finger-like, well-separated; median stripe on female mesonotum yellow, bordered by a narrow dark brown line on each side ..... *unguicornis* (p.112)

♀

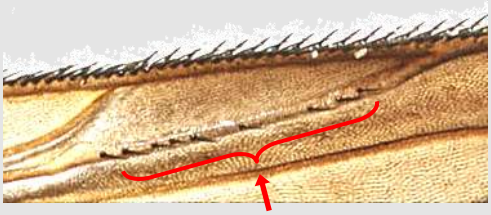


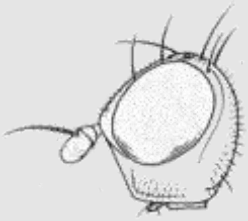
Key to species of *Pelidnoptera*

1. Eyes relatively small; cheek about as high as eye; vein R_1 bare ..... *nigripennis* (p.32)

– Eyes large; cheek about half as high as eye; vein R_1 setose in apical half. Posterior part of male gonostyli bifurcate ..... *fuscipennis* (p.31)



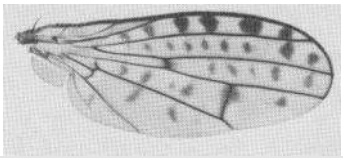



Key to species of *Pherbellia*

1. Mid-frontal stripe extending two-thirds or more of distance from anterior ocellus to fore margin of frons ..... 2.

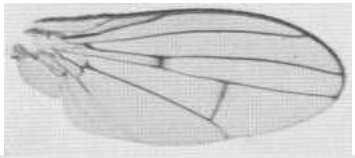
– Mid-frontal stripe shorter, extending no more than half the distance from anterior ocellus to fore margin of frons ..... 7.

2. Wing with a pattern of blackish spots ..... *schoenherri* (p.64)

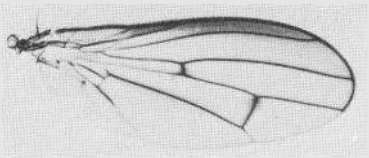


– Wing without a pattern of blackish spots ..... 3.

3. Mid-frontal stripe tapered anteriorly, mostly pruinose, costal margin of wing not darkened ..... 4.



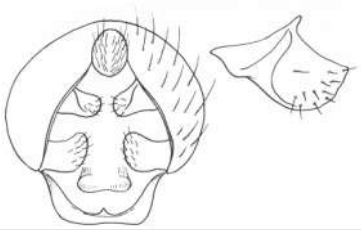
– Mid-frontal stripe usually band shaped and shining brown, costal margin of wing darkened ..... *cinerella* (p.52)

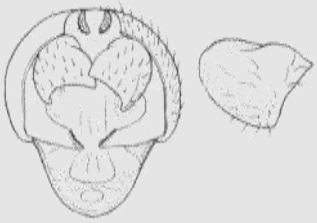
4. Upper posterior margin of sternopleuron without setae ..... 5.

– Upper posterior margin of sternopleuron with distinct upwardly-directed setae; abdomen brown and yellow, transversely striped; posterior part of gonostyli short and broad ..... 6.

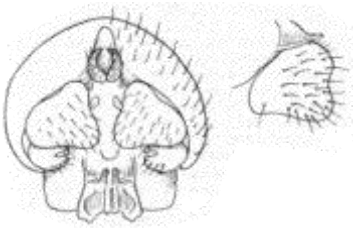
5. Abdomen brown and greyish pollinose; posterior part of gonostyli relatively slender and long; rather a small species (body length 3.2 - 3.4mm) ..... *alpina* (non-British)



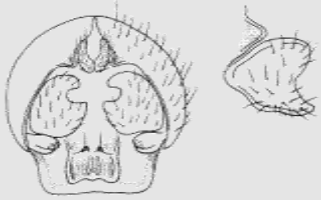
– Abdomen yellowish; posterior part of gonostyli without a pointed tip; a large species (body length more than 5mm) ..... *knutsoni* (p. 59)



6. Row of small hairs along lower frontal eye-margin absent; posterior part of gonostyli rounded on inner side ..... *brunnipes* (p.50)



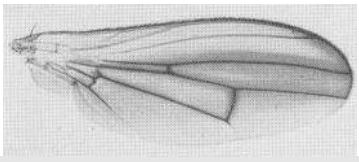
– Row of small hairs along lower frontal eye-margin present, with at least several hairs distinct between anterior orbital seta and base of antennae; posterior part of gonostyli pointed on inner side ..... *stackelbergi* (p.68) [Ireland only]



7. Mesopleuron with hairs along posterior margin ..... 8.

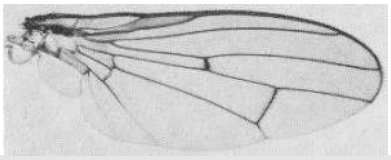
– Mesopleuron entirely bare ..... 11.

8. Whitish band along costal margin of wing present; veins Sc, R_1 and R_{2+3} contrasting yellowish ..... *albocostata* (p.45)

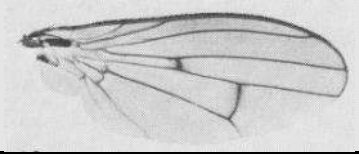


– Whitish band along costal margin of wing absent; all veins of the same colour ..... 9.

9. Arista long-plumose, the longest hairs equalling width of third antennal segment; fore legs yellowish-brown; cross-veins hardly infuscated ..... 10.



– Arista moderately long-plumose, the longest hairs distinctly shorter than width of third antennal segment; fore femur and tibia usually darkened; cross-veins mostly infuscated ..... *griseola* (p.57)

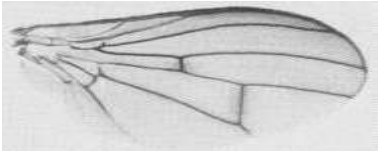


10. Third antennal segment only slightly tapered towards apex; at least some aristal hairs longer than width of third antennal segment; posterior part of gonostyli characteristically curved, each posterior part with a thin inner process ..... *dorsata* (p.53)

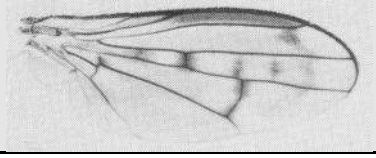
– Third antennal segment almost conical; aristal hairs at most as long as basal width of third antennal segment; posterior part of gonostyli not strongly curved and without inner process..... *obtusa*

11. Middle and hind femora and tibiae with brownish rings before tips ..... 12.
– Middle and hind femora and tibiae without such rings ..... 13.

12. Wings only slightly darkened along costal margin and at cross-veins; larger species (3.6-5.3 mm) ..... *annulipes* (p.47)



– Wings with a brownish pattern consisting of an incomplete transverse stripe before apex and of 2-3 further isolated spots; small species (2.0-3.5 mm) ..... *nana* (p.60)



13. Third antennal segment contrasting black in apical half ..... *dubia* (p.55)

– Third antennal segment usually uniformly reddish-yellow to brown ..... 14.

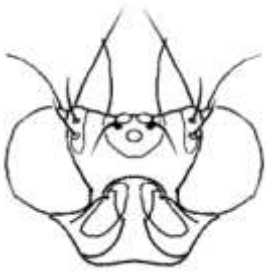
14. Arista short-plumose, longest hairs nearly half as long as width of third antennal segment; anterior part of frons silvery pruinose in males and whitish pruinose in females ..... *argyra* (p.48)

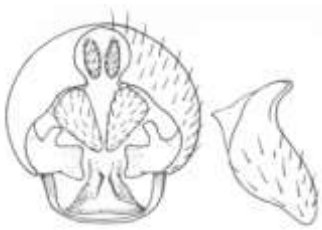
– Aristal hairs much shorter, arista at most pubescent with longest hairs hardly longer than thickness of arista at base; anterior part of frons without pale pruinosity ..... 15.

15. Occiput, pleura and fore legs bluish-grey, abdomen contrasting yellow ..... *ventralis* (p.70)

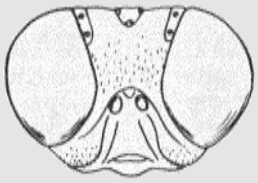
– Body coloured differently ..... 16.

16. Inner angle of eye almost rectangular in frontal view; hind tibia usually with a dark ring at base; anterior part of gonostyli with a stripe-like process ..... *pallidiventris* (p.62)

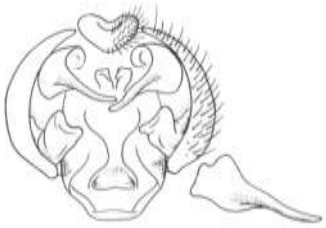




– Inner angle of eye distinctly obtuse in frontal view; hind tibia without a dark ring at base; anterior part of gonostyli without any process ..... 17.

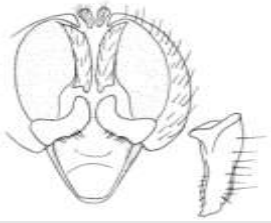


17. Thorax mainly yellow, pleura mainly shining; posterior part of gonostyli long and slender ..... *goberti* (p.56)



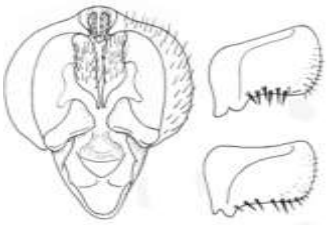
– Thorax mainly brown or greyish; if rarely yellow, then pleura not mainly shining; posterior part of gonostyli not long and slender ..... 18.

18. Pteropleuron with 6-9 hairs; mesonotum, scutellum and upper part of pleura densely brown pruinose; small species (2.8-4.0mm) ..... *obscura* (non-British)



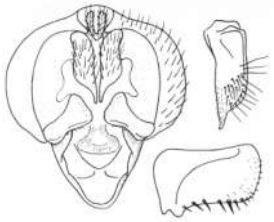
– Pteropleuron usually with two stronger setae in addition to several hairs; thorax more grey or yellow; larger species (4.2-6.0mm) ..... 19.

19. Tip of hind femur usually with a dark spot on inner and outer side; anterior part of gonostyli with strong and long setae ..... 20.



– Tip of hind femur without dark spots; anterior part of gonostyli without strong and long setae ..... *sordida* (p.67)

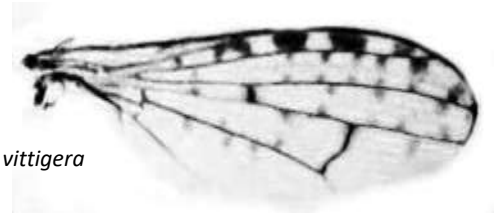
20. Posterior part of gonostyli gradually tapered towards apex ..... *rozkosnyi* (p.63)



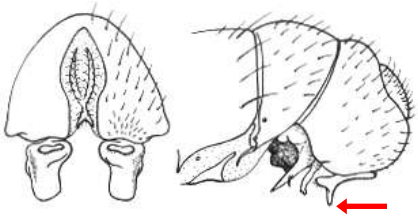
– Posterior part of gonostyli conspicuously dilated before tip ..... *scutellaris* (p.66)

Key to species of *Psacadina*

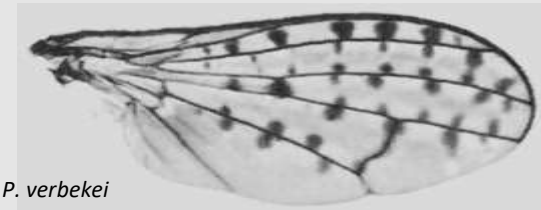
1. Mid-frontal stripe only weakly distinct, whitish pollinose; dark spots in costal cell of wing large, suboblong. Male gonostylus short, in lateral view with a slender right-angled projection ..... *vittigera* (p.117)



P. vittigera



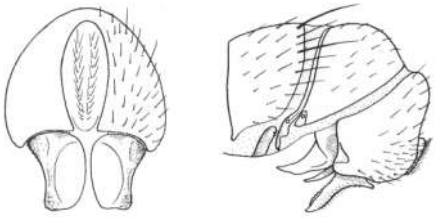
– Mid-frontal stripe well-developed, at least subshining; dark spots in costal cell of wing rounded ..... 2.



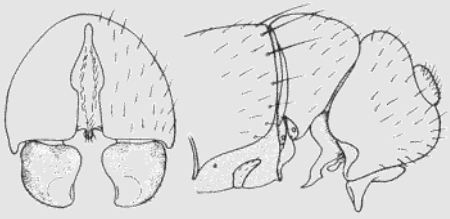
P. verbekei

P. zernyi

2. Male gonostyli elongated, almost straight in lateral view ..... *verbekei* (p.116)



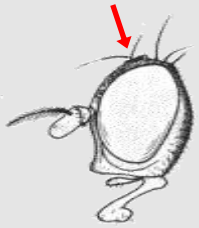
– Male gonostyli short and rounded, distinctly concave in lateral view ..... *zernyi* (p.118)



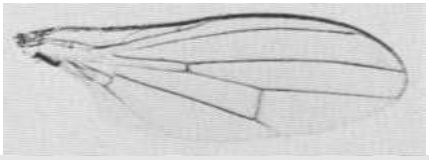
Key to species of *Pteromicra*

1. Third antennal segment and palpi black ..... *oldenbergi* (non-British)
– Third antennal segment at least yellow ventro-basally, palpi entirely yellow .....2.

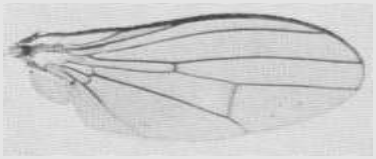
2. Two pairs of orbital setae, though anterior pair often much shorter ..... 3.
– Only one pair of orbital setae .....4.



3. Fore tarsi wholly black, at most last segment in male yellowish to brown; hypopleuron brown to black; wings infuscated and narrow ..... *angustipennis* (p.72)



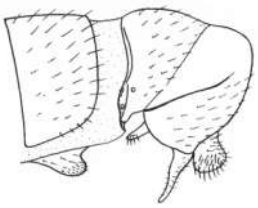
– Fore tarsi with the last 1-3 segments whitish; hypopleuron yellowish; wings broader, mainly hyaline ..... *leucopeza* (p.75)



4. Anterior margin of frons narrowly yellow; face usually black; thorax entirely black and dark brown ..... *glabricula* (p.73)
– Anterior margin of frons extensively yellow; face yellow; sternopleuron and hypopleuron mainly yellowish ..... *pectorosa* (p.76)

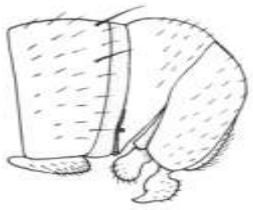
Key to species of *Renocera*

1. One pair or orbital setae; anterior margin of frons broadly shining; apical half or more of third antennal segment dark brown to black ..... *pallida* (p.120)

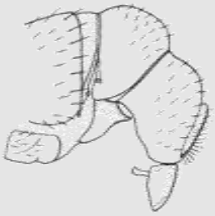


– Two pairs of orbital setae; anterior margin of frons matt; third antennal segment completely yellow ..... 2.

2. Prosternum setose; mid-frontal stripe subshining dark brown; cheek narrower than half width of eye, females without ventral setae on hind femora ..... *striata* (p.121)



– Prosternum bare; mid-frontal stripe subshining yellow; cheek broader than half width of eye; females with strong ventral setae on apical half of hind femora ..... *stroblii* (p.123)



Key to species of *Sciomyza*

1. Third antennal segment black at the apex, contrasting with the yellow basal half. Thoracic dorsum straw coloured, very pale; mesopleuron with only fine hairs along posterior margin ..... *testacea* (p.81)

– Third antennal segment entirely pale, brownish yellow..... 2.

2. Posterior margin of mesopleuron with only fine black hairs; thoracic dorsum reddish-brown to grey-brown ..... *dryomyzina* (p.78)

– Posterior margin of mesopleuron with find black hairs and one or two long, strong bristles; thoracic dorsum dark, almost black especially the scutum ..... *simplex* (p.79)

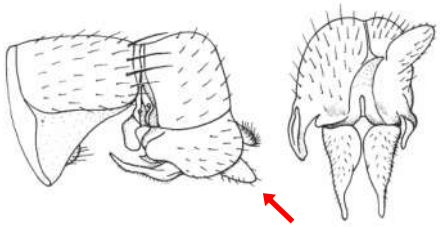
Key to species of *Sepedon*

1. Body metallic bluish-black; legs reddish-yellow ..... *sphegea* (p.124)

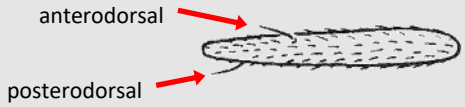
– Body yellowish-brown; legs ochre-yellow ..... *spinipes* (p.126)

Key to species of *Tetanocera*

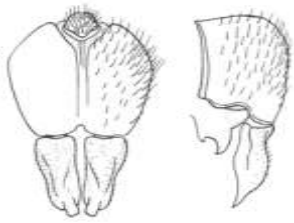
1. Prosternum with a few setae; middle femur with 3-4 setae on posterior side near tip. Male; periandrium asymmetrical, with a conical process on right side ..... *robusta* (p.140)



– Prosternum bare; middle femur at most with 1 seta on posterior side near tip. Male periandrium without such a conical process ..... 2.

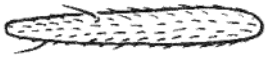


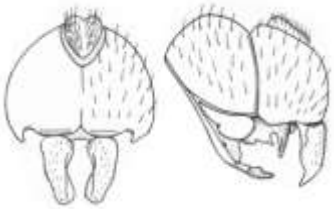
2. Frons completely shining, without a distinct mid-frontal stripe. Male genitalia as illustrated ..... *hyalipennis* (p.134)



– Frons dull (although front margin can be shining), usually with a distinct mid-frontal stripe ..... 3.

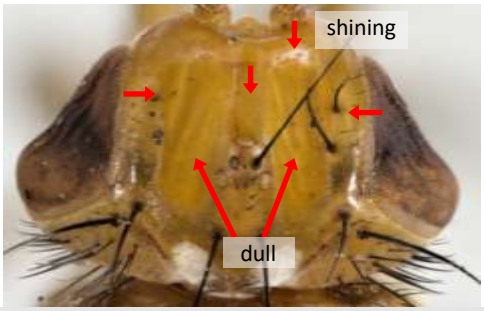
3. Middle femur with a distinct seta on posterior side near tip .....*punctifrons* (p.138)





– Middle femur without a seta on posterior side near tip ..... 4.

4. Anterior margin of frons shining, connected with the shining mid-frontal stripe and orbital plates ... 5.

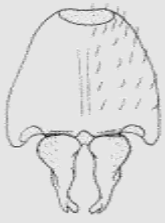


– Anterior margin of frons dull ..... 6.

5. Brown central part of occipital spot is a band, completely dividing the white lateral patches even in their basal half. Male gonostylus single-pointed at tip in lateral view ..... *freyi* (p.132)



– Brown central part of occipital spot confined to upper half and sub-triangular in shape. Male gonostylus double-pointed in lateral view ..... *silvatica* (p.141)

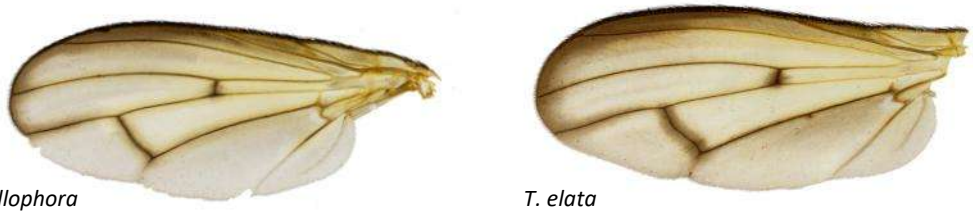

6. Hind femur with a pre-apical posterodorsal seta placed opposite or nearly opposite the apical anterodorsal seta ..... 7.

– Hind femur without a pre-apical posterodorsal seta ..... 8.

7. Central part of occipital spot pale and confined to upper half; sub-triangular in shape; anterior orbital seta closer to inner vertical seta than to anterior margin of frons. Male gonostylus tapering to a slender point in lateral view ..... *arrogans* (p.128)

– Central part of occipital spot is a dark band completely dividing the spot; the silvery whitish area completely separated basally. Anterior orbital seta closer to anterior margin of frons than to inner vertical seta. Male gonostylus swollen at base and abruptly narrowed to a short point in lateral view ..... *montana* (p.135)

8. Costal margin of wings intensively darkened ..... 9.

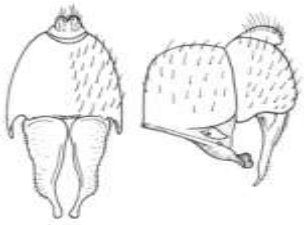


T. phyllophora *T. elata*

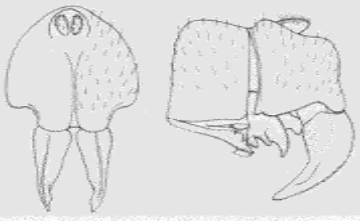
– Costal margin of wings only slightly and at most partly infuscated ..... 10.

T. ferruginea

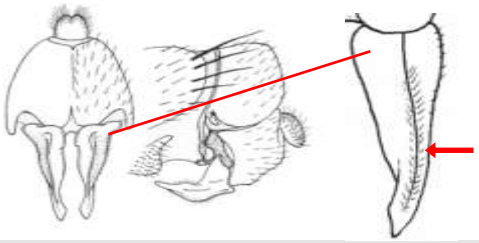
9. Brown central part of occipital spot is a dark band completely dividing the spot. Male gonostylus straight, slender and pointed in lateral view, abruptly tapered to a parallel-sided projection in dorsal view ..... *elata* (p.129)



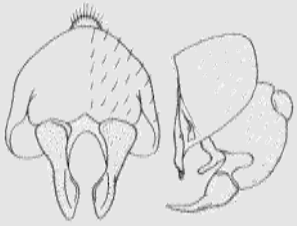
– Central part of occipital spot is pale and abruptly narrowed in middle. Male gonostylus in lateral view, broad basally, bent in the middle and gradually tapered towards tip. Gonostylus with conspicuous small bristles along the longitudinal dorsal ridge ..... *phyllophora* (p.137)



10. Mid-frontal stripe a distinct shining band; two (dorsal + anterodorsal) pre-apical bristles on hind tibia; male genitalia with gonostylus broad basally, moderately curved at middle and then tapering to a blunt point in lateral view, gonostylus with conspicuous small bristles along the longitudinal dorsal ridge, flattened and narrowly truncate distally in dorsal view ..... *ferruginea* (p.131)



– No distinct mid-frontal stripe, with a broad sub-shining not differentiated clearly from the rest of the frons; usually a single dorsal pre-apical bristle on hind tibia, anterodorsal weak or missing; male genitalia with gonostylus moderately deep basally, evenly curved and tapering to a point in lateral view, gonostylus broadly truncate distally in dorsal view ..... *fuscinervis* (p.133)



Coverage

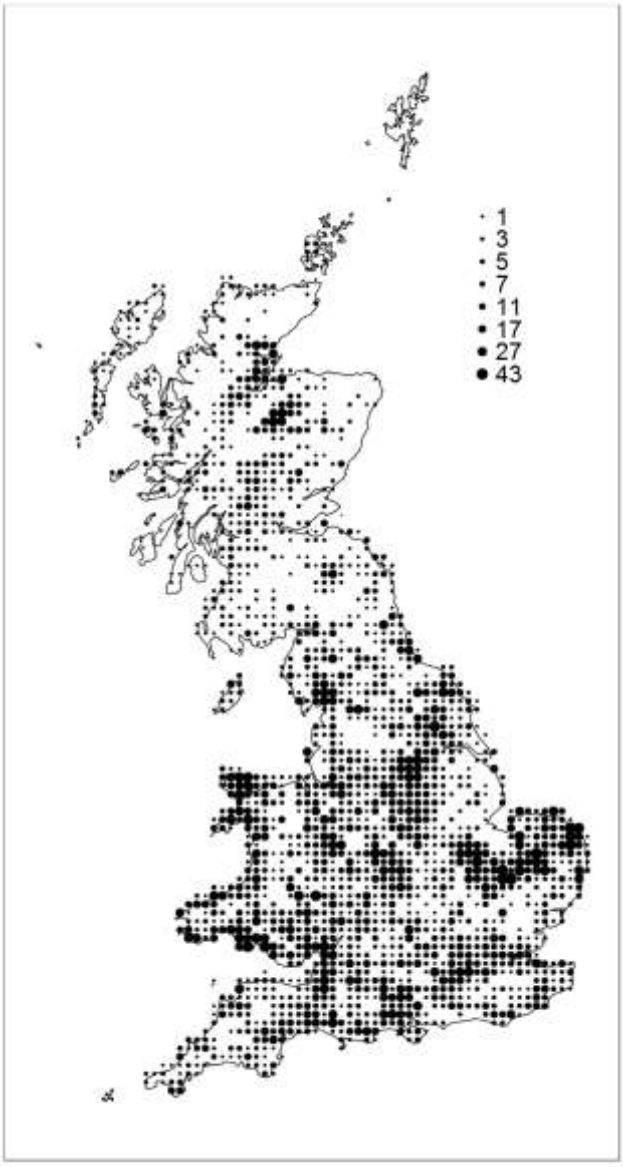
Distribution maps

The distribution maps show hectads (10 km squares) of the Ordnanace Survey National Grid for Great Britain from which a record has been made.

The shape of symbols (circle or square) indicates the source of records from a given hectad. If there is a record in the Sciomyzid Recording Scheme database, then the symbol is round, otherwise (i.e. if the only records from that hectad come from the National Biodiversity Network (NBN) or iRecord) then the symbol is square. Recording scheme records have received more scrutiny than those from the NBN/iRecord and, consequently, the species identification can be considered somewhat more reliable (but at this stage of development of the Scheme, verification of the identity cannot be considered to be well established).

Shading is used to indicate the date of the most recent record from a hectad. Black symbols indicate that the most recent record is dated from 2000 onwards, grey from 1980 to 1999 and white before 1980 (or if there are no records with a known date).

All records



Number of species per hectad

Phenology

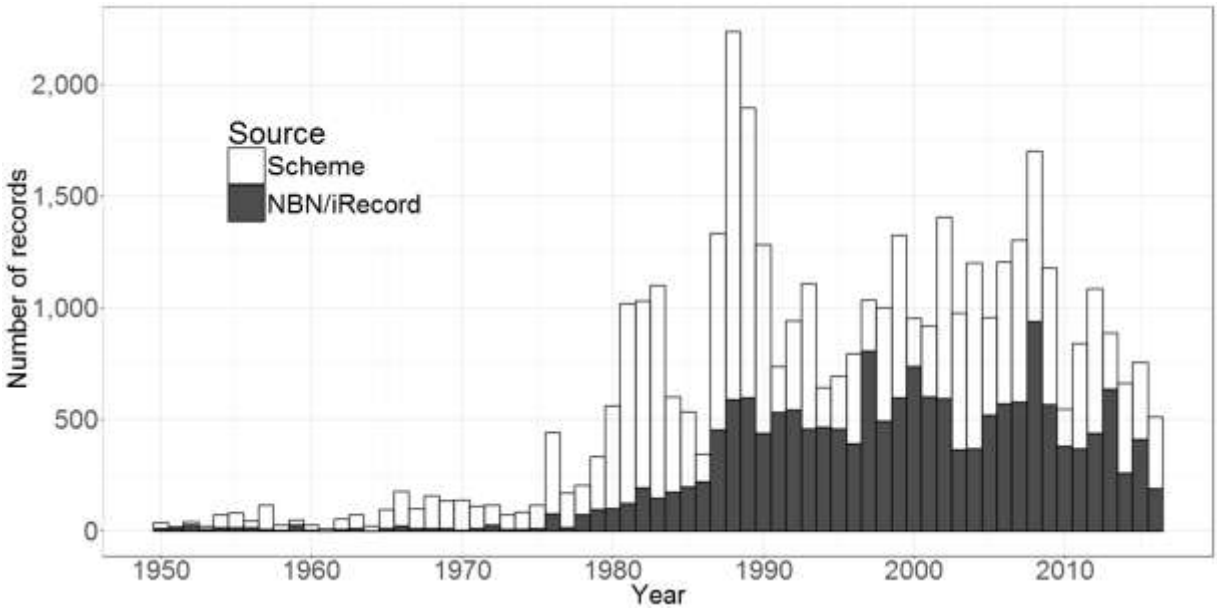
The phenology histograms show the number of unique records per week since 1950. Unique records are unique combinations location (i.e. the grid reference), the date and the name of the species. Thus two or more records of the same species at the same date from the same grid reference, however they arise, are only counted as one.

Shading is used to indicate the age of the records: light grey indicates records from earlier than 1980 and dark grey from 1980 onwards.

Number of records on which distribution and phenology figures are based

Records were collated for a provisional atlas (Ball & McLean, 1986) in a Recorder 3 database. This was passed to Ian McLean, as the Sciomyzid Recording Scheme organiser, but remained unused on an ancient PC. Eventually this PC failed and a disk recovery service was used to recover the necessary files from it. These were returned to Stuart Ball in 2012 who was able to transfer the data to a Recorder 2002 database. Darwyn Sumner has also collated records for the Scheme and a copy of those was incorporated. Subsequently, readily available data has been added from data collated from Dipterists Summer field meetings and their own records from Stuart Ball, Roger Morris and Alan Stubbs. A request for records was also made via the Dipterists Forum website on 18/01/2017 and, as a result, a number of members kindly contributed records. The total number of records included in the database at the time of writing is 31,045.

In addition, publicly available records have been extracted from the NBN and records entered on to iRecord were kindly supplied by Martin Harvey (extracted 27/01/2017). The dataset used to generate the distribution maps and phenology figures consist of the unique records from the Scheme dataset plus additional unique records from NBN/iRecord that were not present in the Scheme data. The total numbers of unique records at the time of writing is 25,028 from the Recording Scheme and 17,894 from NBN/iRecord making 42,922 in total.



Number of unique records per year

Species accounts

Family Sciomyzidae

Small to large (2-14 mm), generally slender flies with a body colour varying from black lustrous to dull grey, brown, reddish or yellow. Antenna sometimes elongate; arista pubescent or with shorter or longer rays; ocelli present; Ocellar bristles usually present, rarely (*Sepedon*) absent; Postvertical bristles diverging to parallel, sometimes slightly converging in *Pteromicra*; 1-2 pairs of frontal bristles, curving backward, the lower pair sometimes curving inward; interfrontal bristles absent; interfrontal setulae sometimes present; vibrissae absent. Wing clear or with conspicuous markings; Costa continuous; vein Sc complete; cross-vein BM-Cu present; cell cup closed. Tibiae almost always with dorsal preapical bristle.

The larvae of nearly all species feed on snails or slugs, some feeding on the eggs of snails. Most of the known larvae are semi-aquatic, some are aquatic, but a number of species have terrestrial larvae. Larvae mainly prey on snails lacking an operculum; in general, aquatic larvae have to visit the surface frequently in order to breathe but some species preying on bivalves have adapted to breathing under water. The larvae of some species preying on terrestrial snails and slugs are parasitoids that develop inside a single snail or slug; in other terrestrial species the penultimate instar emerges from the snail or slug it developed in and are as last instar predatory on several snails. The adults are often found sitting on the vegetation, their heads down. Depending on the larval habitat, they are often found near water, in marshy vegetation, but also in woodland or even dry open habitats.

Sub-family Phaeomyiinae

This sub-family was separated as the family Phaeomyiidae following Griffiths (1972), who based the separation on genital structure, and the discovery that these flies parasitise millipedes (Vala *et al*. 1990), in contrast to the mollusc association of other Sciomyzidae, tended to confirm a more remote relationship. However, its position as a subfamily of Sciomyzidae (as in Kloet & Hincks (1976) and Rozkošný & Elberg (1984)) has now been restored by Vala *et al*. (2012).

Small to large (3-11 mm), yellowish brown to brown coloured, slender flies with brownish tinged wings. Arista pubescent; ocelli present; ocellar bristles present; postvertical bristles diverging; 2 pairs of frontal bristles, curving backward; interfrontal bristles absent; vibrissae absent. Wing tinged brown, without markings; costa continuous; vein Sc complete, cross-vein BM-Cu present; cell cup closed. Tibiae with dorsal preapical bristle.

The members of the Phaeomyiinae differ from the rest of the Sciomyzidae by the presence of the median anterodorsal and posterodorsal setae on the middle and hind tibiae, by some unique characters in the male postabdomen, and by the number of spermathecae in the female. On the pleura, a strong propleural seta is always present, several hairs are distinct along the posterior margin of the mesopleuron, and 1-2 strong pteropleurals are developed. Vein R_1 on the wing is setose except in *Pelidnoptera nigripennis*.

The male protandrium is highly asymmetrical. Tergum 6 is reduced as in other Sciomyzidae. The ventral vestiges of terga 7 and 8 are distinct. Sterna 6-8 are markedly displaced to the left and dorsal side. Left abdominal spiracles 6 and 7 are also shifted dorsally and located within the sterna, and spiracle 7 is situated in the mid-dorsal position. Right spiracles 6 and 7 are located ventrally in the membrane.

The andrium is symmetrical, and the cerci are elongated apically and sometimes even swollen. The anterior part of the gonostyli bears blunt, short, thickened setae, and resembles the genus *Colobaea* in this respect. The posterior part of the gonostyli is bifurcate except in *P. leptiformis*. The ejaculatory apodeme is only small, and the postgonites are developed as in the Tetanocerini. The aedeagus has small pubescent basal lobes that are sometimes only weakly distinct. The females have 3 spermathecae.

One species (*P. nigripennis*) in this small family is known to be a parasitoid of Diplopoda (millipedes) of the genus *Ommatoiulus*.

On a world basis, only the one genus is known.

Genus *Pelidnoptera* Rondani, 1856

Pelidnoptera Rondani, 1856: 107.
Type-species: *Musca nigripennis* Fabricius. 1794 (orig. des.).
Phaeomyia Schiner, 1862: 148.
Type-species: *Sciomyza fuscipennis* Meigen, 1830 (subseq. des. by Hendel, 1923: 206).

The characteristics of this genus are the same as those given above for the Phaeomyiinae. Altogether 3 species have been described, all occurring mainly in Europe but only 2 of them extend into northern Europe and occur in Britain.

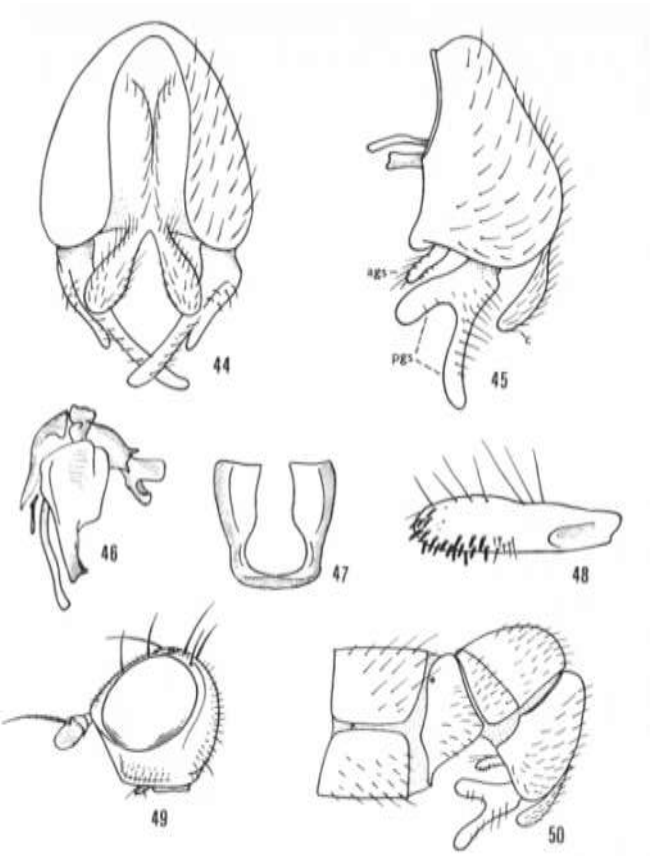
Pelidnoptera fuscipennis (Meigen, 1830)

Sciomyza fuscipennis Meigen, 1830: l6.
Sciomyza fumipennis Zetterstedt, 1846: 21 10.

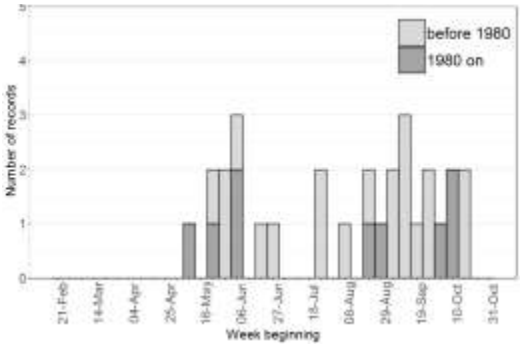
Description: A brownish species with infuscated wings. Mid-frontal stripe elongate-triangular, reaching beyond middle of frons. Arista pubescent; cheeks about half as high as eye. Prosternum with 1-2 bristle-like hairs on each side. Mesonotum brownish, with four longitudinal stripes. Wings brownish infuscated with several pale spots near base. Vein R_1 setose in apical half. Middle femora with 1-2 anterior setae, middle tibiae often without median anterodorsal setae and 2-3 posterodorsal setae, hind femur with 2-3 anterodorsal in apical third, and hind tibia with 2 anterodorsal and 2-3 posterodorsal. Male andrium relatively slender, cerci elongated but only slightly swollen, posterior part of gonostyli bifurcate but both rami relatively little divergent. Length: body 3.0-7.2 mm, wing 3.2-6.8 mm.

Distribution: A European species, extending from Scandinavia south to northern France and from Britain eastwards through central Europe to Ukraine and the southern part of European Russia. Widespread and not uncommon in wooded areas throughout Britain. Recorded from 63 hectads before 1980 and 153 hectads since.

Biology: Unknown, but assumed to be similar to *P. nigripennis*. The adults have been mainly collected in deciduous forests, especially beside streams and pools and also at forest edges, from the end of May to mid-August.



Figs. 44-50. *Pelidnoptera fuscipennis* (Meig.). – 44 & 45: andrium in posterior and lateral view; 46: inner copulatory organ; 47: hypandrium in ventral view; 48: anterior part of gonostylus from inner side; 49: head; 50: male postabdomen in lateral view. For abbreviations see p. 26.



Pelidnoptera nigripennis (Fabricius, 1794)

Musca nigripennis Fabricius, 1794: 346.

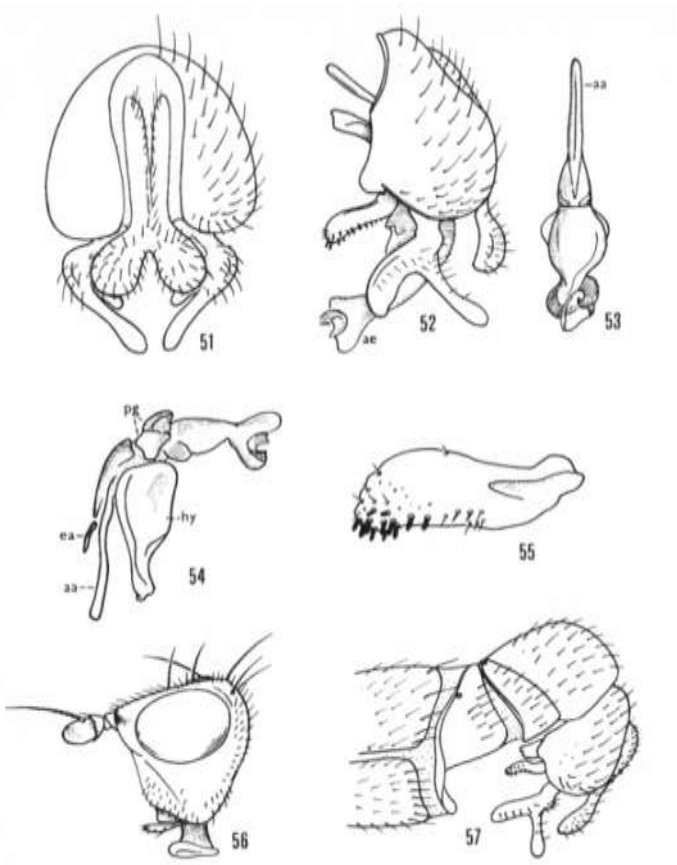
Oscinis melanoptera Oliver, 1812: 566.

Description: Usually even darker brown than *P. fuscipennis*. Head conspicuously sub-triangular in lateral view, eyes relatively small and transverse, cheek reaching height of eye. Pubescence of arista very short. Dark longitudinal stripes on mesonotum often only weakly distinct. Wings infuscated dark brown, often almost black along costal margin. Pale spots at base of wing as in *P. fuscipennis*. Vein R_1 entirely bare, prosternum also bare. Setae on middle and hind legs as in preceding species, but 1 median anterodorsal seta on middle tibia always present. Male andrium distinctly swollen, cerci almost hemispherical. Posterior part of gonostyli bifurcate, both rami widely divergent. Length: body 5.8-11.0 mm, wing 5.4-7.8 mm.

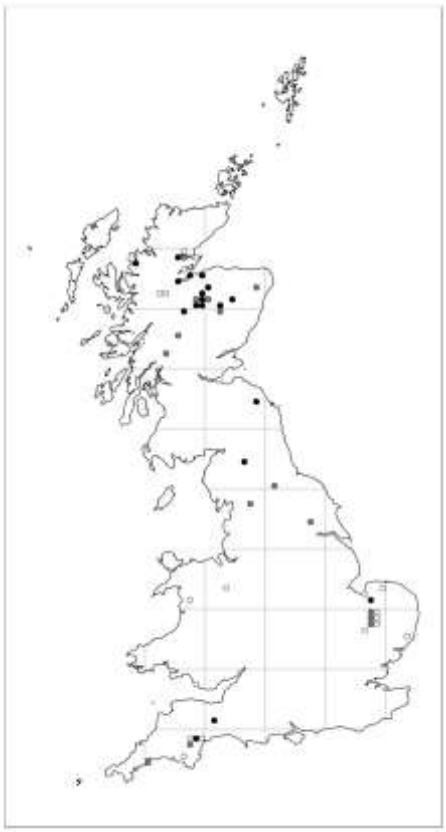
Distribution: A European species, extending from central Scandinavia south to Portugal and the Mediterranean; Britain eastwards into European Russia, parts of the former Yugoslavia, Romania,

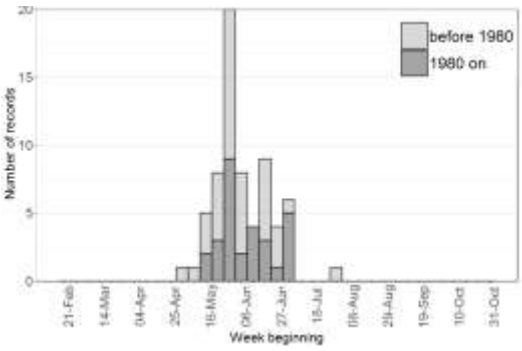
Azerbaijan and Armenia. A scarcer species that *P. fuscipennis* in Britain and accorded the status '**Notable**' by Falk (1991). Most frequently recorded from coniferous woodlands and plantations in Scotland, but there are records from Wales and western counties of England and also from the coniferous areas of north Norfolk and the Brecks. Recorded from 19 hectads before 1980 and 33 hectads since.

Biology: The species appears to be confined to damp woodland, but in central Europe it is more frequent in montane and submontane situations in pine forest with a scrub layer. A parasitoid of Diplopoda (millipedes) of the genus *Ommatoiulus*. The female deposits her eggs on the millipede after which the young larva enters its host. Usually only one larva per millipede will emerge. The host remains alive until the larva is fully grown and pupates in the host which, by that time, is no more than an empty shell (Vala, *et al*. 1990). Flight period from May to the end of June, only rarely in July.



Figs. 51-57: *Pelidnoptera nigripennis* (Fabr.). – 51 & 52: andrium in posterior and lateral view; 53: aedeagus in dorsal view; 54: inner copulatory organ; 55: anterior part of gonostylus from inner side; 56: head; 57: male postabdomen in lateral view. For abbreviations see p. 26.





Sub family Salticellinae

Only one recent genus and species, *Salticella fasciata*, 7.5-10.0 mm, West Palaearctic, extending northwards as far as Ireland and Great Britain.

Salticella fasciata (Meigen, 1830)

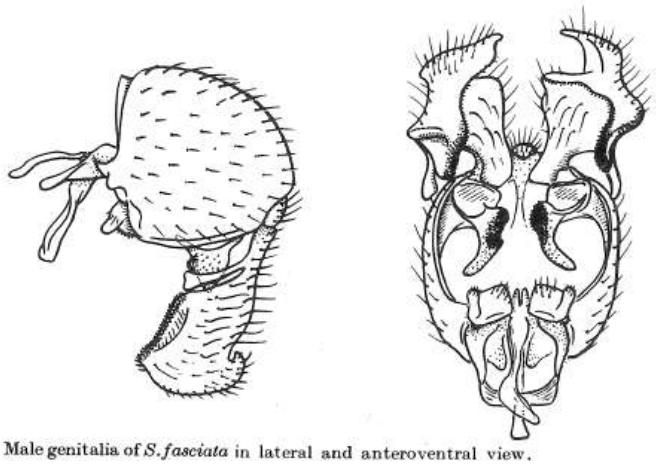
Eggizoneura maculipes Rondani, 1868
Salticella maculipes (Rondani, 1868)

Description: Mid-frontal stripe matt, elongate-triangular, almost reaching the anterior margin of the frons. Only one orbital bristle. Arista virtually bare, one genal bristle in mid-ventral position. Anterior pair of dorsocentral bristles missing, other thoracic setae complete. Pleura bare, except sternopleuron with one strong seta and several hairs along upper margin. Hind femora with rows of antero- and postero-ventral spines in apical half and a row of 4-5 anterodorsal setae. The wing venation is distinctive. Posterior parts of gonostyli remarkably large and partly asymmetrical. Inner copulatory organ, including hypandrium, relatively small. Body length 7.5-10.0 mm, wing length 7.5-8.2 mm.

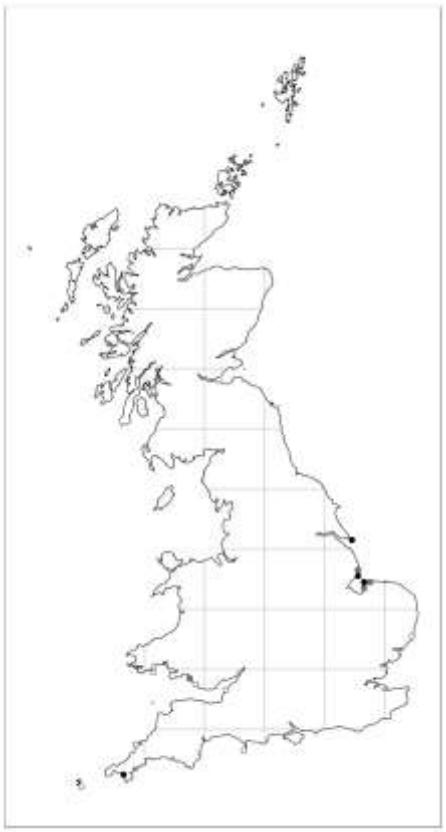
Distribution: In western Europe, it is mainly recorded from coastal areas; on the Atlantic coast from Ireland, Britain and northern France to the Pyrenees and the Mediterranean coast from the Iberian Peninsula to Greece. Further east, it occurs from central Europe (Czech Republic, Hungary), Turkey to Egypt to Ukraine, Iran and the southern parts of European Russia. In the eastern part of its range it occurs far inland and has been found up to 1000m. Known in Britain from just a few coastal localities: from Kenfig dunes (Glamorganshire) westwards to Tenby (Pembrokeshire) on the South Wales coast, the north Norfolk coast of the Wash, Gibraltar Point (Lincolnshire) and Spurn (Yorkshire). In addition, found in Cornwall (Loe Bar) by Steve Falk in 2005. '**Vulnerable**' according to Falk (1991) and listed as a BAP priority species (JNCC, 2010). Recorded from 8 hectads before 1980 and 8 hectads since.

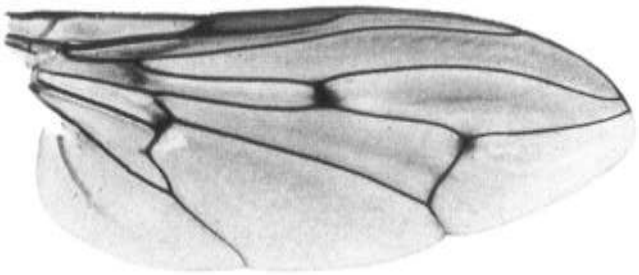
Biology: Inhabits dry, ungrazed or lightly grazed grassland including dunes. Coupland *et al*. (1994) provide both laboratory and field observations. Eggs are laid on the shells of terrestrial snails of a wide range of species, showing a strong preference for shells of 10mm or more in diameter. Larvae feed within the snails, but leave the shell and pupate in damp sand, just below the surface. In the northern part of its range, there are two generations, the first around May/June and the second from August to October in Britain. There may be three generations in southern Europe.

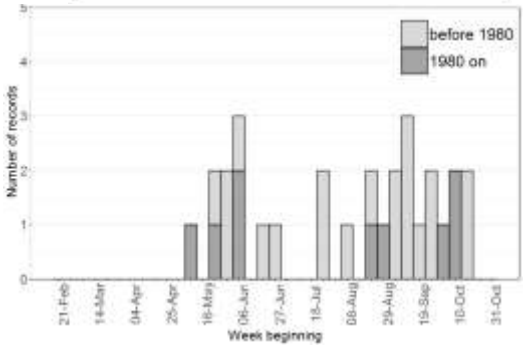
Coupland, *et al*. (1994) investigated its potential as a biological control agent against snails such as *Theba pisana*, *Cernuella virgata*, *Cochlicella acuta* and *C. barbara* which are species from the Mediterranean region which have become pests in Australia. Although it would lay eggs in the umbilicus of *Theba* it was found to be ineffective in killing the snail. They concluded that it was probably a saprophage rather than a parasitoid/predator.



Male genitalia of *S. fasciata* in lateral and anteroventral view.







Sub family Sciomyzinae

The species of Sciomyzinae never have the median setae on the middle and hind tibiae, vein R_1 is always bare, the spiracles of the male protandrium are in a lateral position, and only two spermathecae are present in the females. The presence of hairs and setae on the pleura is much more variable than in Phaeomyiinae, and the mesopleuron and pteropleuron may even be entirely bare.

The male protandrium is highly asymmetrical as in the Phaeomyiinae, but sternum 6 is usually more reduced and mainly bare. Various projections may arise from sternum 6 ventrally. The vestiges of terga 7 and 8 are usually indistinct but are apparently present in the Tetanocerini. Abdominal spiracles 6 and 7 are always situated laterally (or ventrolaterally) and are placed within the membrane or sclerite. In some genera the asymmetry of the andrium may be reflected in the shape of the gonostyli, or the form of the hypandrium or even the periandrium. The anterior part of the gonostylus bears short, blunt and thickened setae only in *Colobaea*. The posterior part of the gonostylus is never bifurcate. The inner copulatory organ is different in structure in the two tribes. The larvae live as predators and parasitoids of molluscs. Altogether 81 species have been found in the nordic area. According to Steyskal (1965), the subfamily

Sciomyzinae is subdivided into the tribes Sciomyzini and Tetanocerini. Because the relationships of the individual genera within the tribes are still not sufficiently clear, the genera are arranged alphabetically in each tribe in the text below.

Tribe Sciomyzini

Propleural seta usually well-developed. Second antennal segment always short, not elongated. Male left abdominal spiracles 6 and 7 usually situated in the membrane, or spiracle 7 in sternum 7. Right abdominal spiracles 6 and 7 always placed in the membrane. Vestiges of terga 7 and 8 indistinct. Andrium symmetrical, including hypandrium, but a certain asymmetry may be evident in the distiphallus. Gonostyli usually well-developed and each divided into an anterior and posterior part, but rarely reduced (in some *Pherbellia* and in *Tetanura*). Pregonites and postgonites often large and well-separated, epiphallus present in many species, paraphallus developed in some species of *Colobaea* and *Pherbellia*. Female terminalia simple, a unique ovipositor known only in *Tetanura*.

All the known larvae live as parasitoids of pulmonate snails, and some of them have a highly specialised biology.

Genus *Colobaea* Zetterstedt, 1837

Type-species: *Opomyza bifasciata* [sic!] Fallén, 1820b (= *Opomyza bifasciella* Fallén, 1820b) (mon.).
Crenulus Rondani, 1856: 107.
Type-species: *Opomyza pectoralis* Zetterstedt, 1847 (orig. des.).
Melariochira Schiner, 1864: 238 (note).
Type-species: *Opomyza distincta* Meigen, 1830 (orig. des.).
Calobaea, emend. or error (Hendel, 1902a: 16).

Mainly tiny and at least partly black species, only *C. bifasciella* yellowish-brown. Frons matt and often velvety-black, mid-frontal stripe not present, 2 orbitals always present. Propleural seta often only weak and short but distinct, prosternum and mesopleuron always bare, sternopleuron haired and usually with 1-3 distinct setae at upper margin, pteropleuron with several bristle-like hairs. Inner posterior margin of hind coxae bare. On wing, vein Sc ending close to R_1 and vein R_1 ending well before anterior cross-vein. Anal vein evanescent apically, not reaching posterior wing margin. Anterior part of gonostyli with characteristic blunt, short and thickened setae. Hypandrium mostly with a narrow and long posterior process (except in *bifasciella*. Pregonites and postgonites very distinct though often narrowly fused. Paraphallus well-developed in *bifasciella* and *distincta*.

The biology has only been studied in *bifasciella*, but the puparia of a further 3 species have been found in the shells of various aquatic snails. Consequently, a highly specialised parasitoid mode of life is inferred for all larvae of this genus. Eight species of *Colobaea* have been described so far, seven of them being known to occur in the Palaearctic and one in the Nearctic region. Four species are recorded from the British Isles.

Colobaea bifasciella (Fallén, 1820)

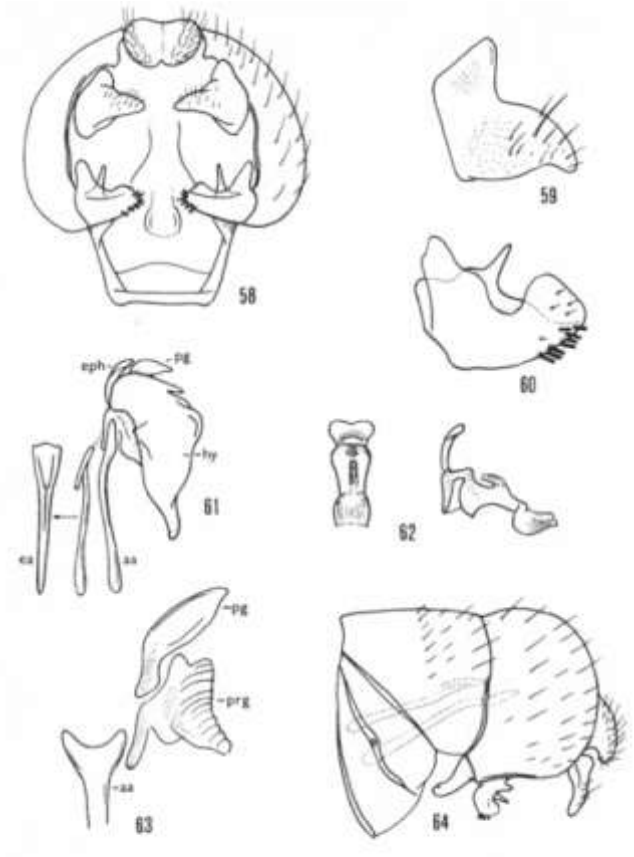
Opomyza bifasciella Fallen, 1820b: 12.
Sciomyza concentrica Meigen, 1830: 12.

Description: Body mainly yellowish; thorax and abdomen with brown longitudinal stripes on ; mesonotum, scutellum, and dorsum and sides of abdomen. Legs yellow, with a brown longitudinal dorsal stripe on fore femora darkened tips to other femora and brownish fore tibiae. Wings with a characteristic pattern: two brownish transverse stripes, a spot at anterior cross-vein, and infuscated Cu vein. Posterior part of gonostyli relatively small, anterior part with a slender inner process Posterior process of hypandrium

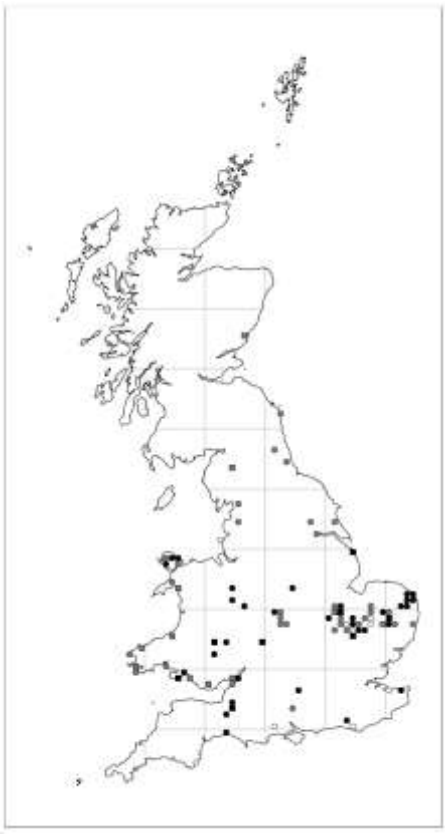
virtually indistinct, pregonites and postgonites well-separated, and a cylindrical paraphallus present. Length: body 2.2-4.0 mm, wing 2.4-3.8 mm.

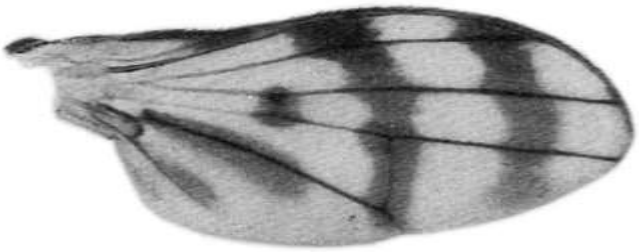
Distribution: A European species, extending from Lapland to northern France and from Ireland through northern central Europe to Hungary and European Russia. Local in England and Wales in dry grasslands and fens, also beside ponds and at wood margins. Recorded from 9 hectads before 1980 and 83 hectads since. '**Notable**' according to Falk (1991).

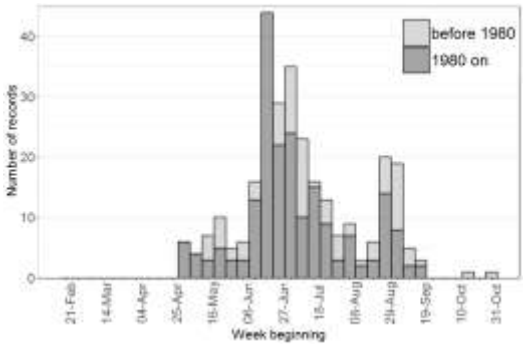
Biology: *A*n uncommon species of damp woods, margins of ponds and rivers. The female lays one or two eggs across the shell sutures of stranded lymnaeid snails such as *Lymnaea palustris* or *L. truncatula*, away from the water edge. The entire development takes place within a single snail. The young larva penetrates into the respiratory chamber where it feeds mainly on mucus. The older larva feeds vigorously and consumes most of the soft parts in about 25 days then pupates within the shell. Two or three generations may develop in a year. The puparium over-winters within the host snail. The flight period is from the end of May to mid September The puparium was first illustrated by Lundbeck (1923), and the life-history was studied by Knutson & Lyneborg (1965).



Figs. 58-64. *Colobaea bifasciella* (Fall.). – 58: andrium in ventral view; 59 & 60: posterior and anterior part of gonostylus; 61: inner copulatory organ; 62: aedeagus in ventral and lateral view; 63: pregonite and postgonite; 64: male postabdomen in lateral view. For abbreviations see p. 26.







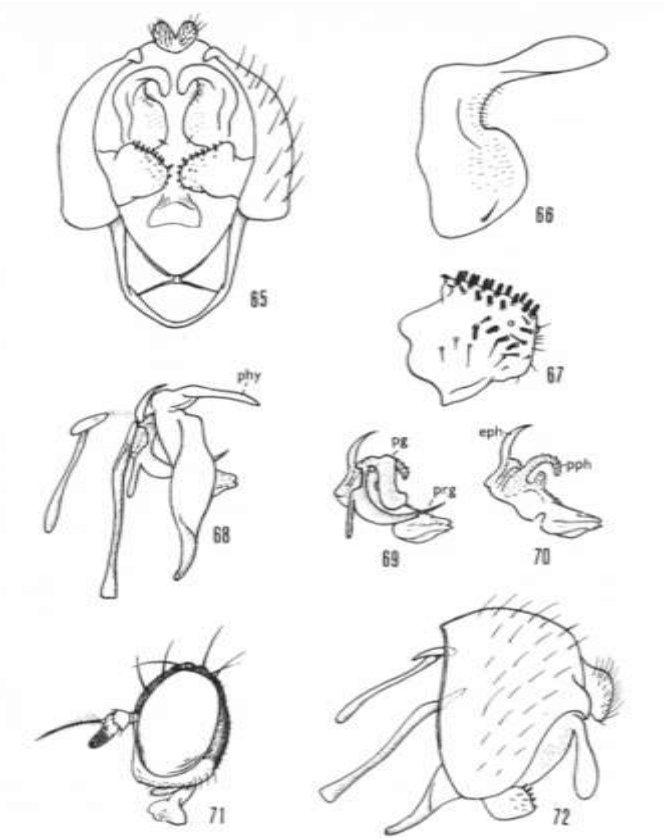
Colobaea distincta (Meigen, 1830)

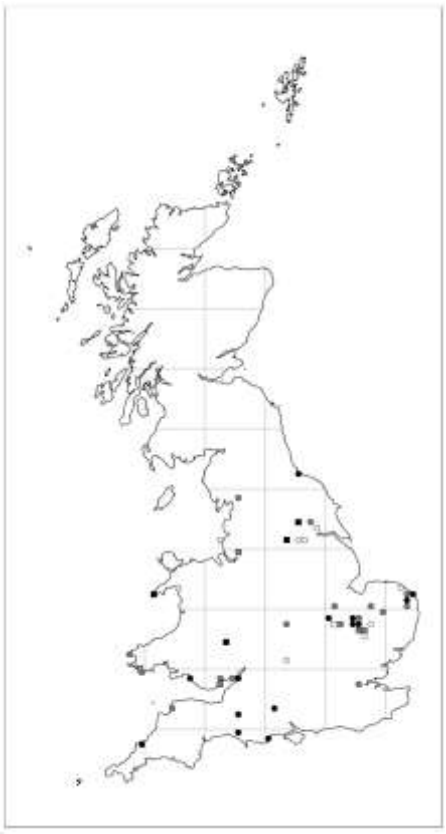
Opomyza distincta Meigen, 1830: 106.

Description: A mainly black species. Frons completely velvety-black, face and cheeks yellow. Antennae also yellow, but third segment mainly black except for base; arista mainly white and with whitish hairs. Cheeks relatively very narrow. Thorax subshining black and whitish pollinose, abdomen dark brown to black. The propleural bristle above front coxa is often weak and hard to see in this species. Legs mainly yellow, only fore legs black except for coxae, greater part of femora and last two tarsal Segments. Veins R_{4+5} and M slightly convergent at wing margin, cross-veins close to each other. Male andrium with a long process on posterior part of gonostylus, anterior part of gonostylus simple, with the usual short and thickened setae. Hypandrium with a long and slender posterior process, pregonites pointed apically and aedeagus with a complicated, duplicated paraphallus. Length: body 2.0-3.4 mm, wing 1.9-3.2 mm.

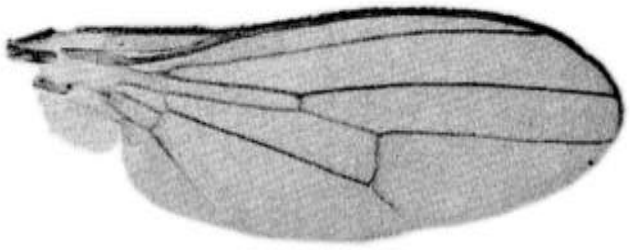
Distribution: A European species, extending from Scandinavia south to France and from Ireland eastwards through central Europe to northern Italy and Romania. Scarce in Britain, besides ponds and next to ditches in marshes. '**Rare**' (RDB3) according to Shirt (1987). Revised to '**Notable**' by Falk (1991). Recorded from 9 hectads before 1980 and 38 hectads since.

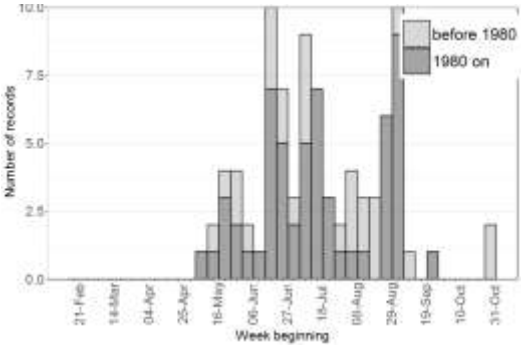
Biology: Several puparia were found inside empty shells of *Anisus spirorbis* on the edges of vernal pools. The puparium was described and illustrated by Rozkošný (1967). Flight period from end of May to September.





Figs. 65-72. *Colobaea distincta* (Meig.). – 65: andrium in ventral view; 66 & 67: posterior and anterior part of gonostylus; 68: inner copulatory organ; 69: aedeagus and gonites; 70: aedeagus; 71: male head; 72: andrium in lateral view. For abbreviations see p. 26.





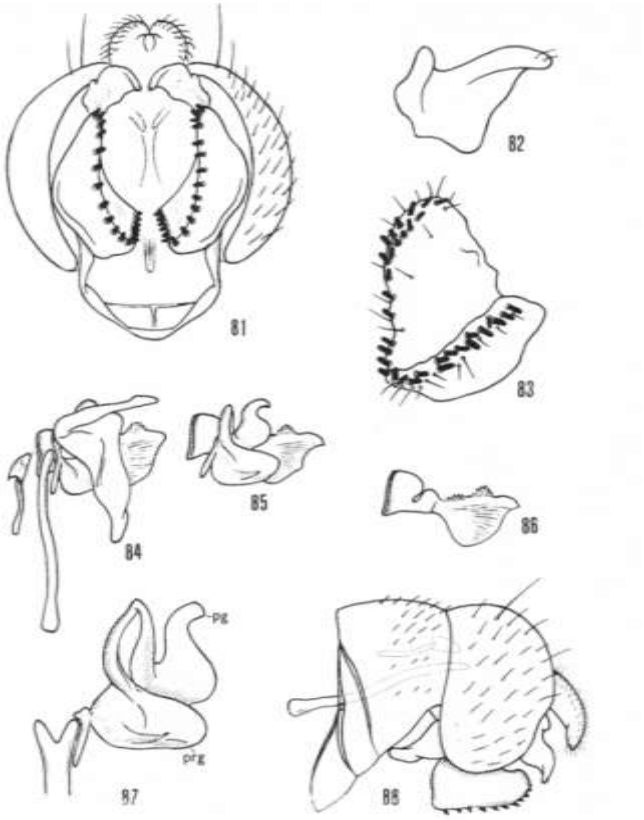
Colobaea pectoralis (Zetterstedt, 1847)

Opomyza pectoralis Zetterstedt, 1847.

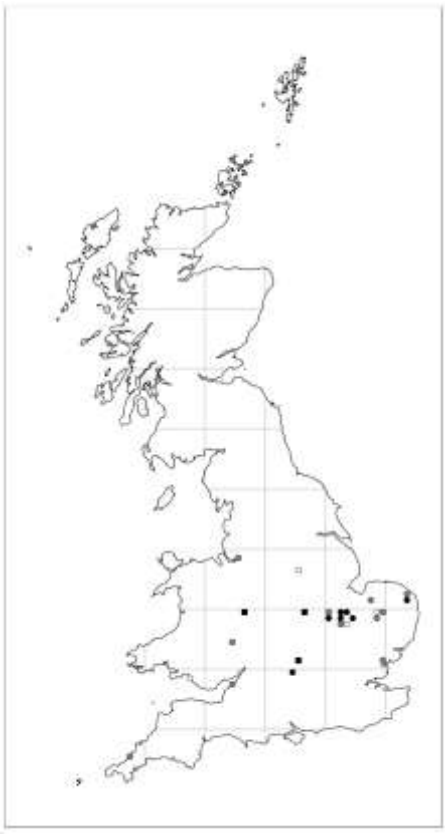
Description: Black and yellow species. Colour of head as in *C. distincta*, but thorax extensively yellow on notopleura and pleura. Mesopleuron with a longitudinal blackish stripe along upper margin, and sternopleuron and pteropleuron also partly darkened. Legs as in *C. distincta*, i.e. only fore legs partly black, but greater part of fore femora and last 2 segments of fore tarsi yellow. Abdomen mainly subshining black, with a yellow longitudinal stripe on each side and apical sterna mainly yellow. Veins R_{4+5} and M parallel at wing margin and distance between cross-veins relatively long. Male cerci elongated, gonostyli with only a small posterior part but a very enlarged anterior part. Aedeagus without distinct paraphallus, pregonites and postgonites of characteristic shape, as is the hypandrium. Length: body 2.0-3.5 mm, wing 1.8-3.2 mm.

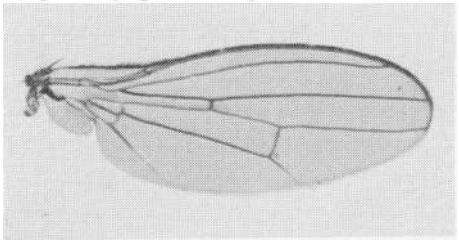
Distribution: A West Palaearctic species, extending from Great Britain and central Fennoscandia to North Africa (Egypt), and eastwards to the Leningrad district. In Britain, local, beside ponds and ditches with summer draw-down in water levels (but scarcer than *C. punctata*). '**Vulnerable**' (RDB2) according to Falk (1991). Recorded from 4 hectads before 1980 and 21 hectads since.

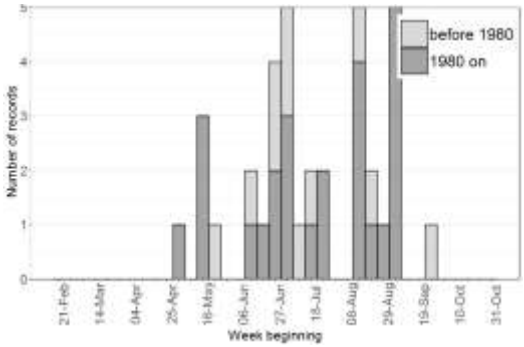
Biology: Found on the edges of vernal pools in grassland and along permanently wet drainage ditches with slow-moving water. The larva is an internal parasitoid of *Anisus vortex* and pupation takes place within the shell. Over-winters as a puparium within the host shell. The puparium was figured by Lundbeck (1923) and described by Rozkošný (1967). The flight period is from the end of May to the end of September.



Figs. 81-88. *Colobaea pectoralis* (Zett.) – 81: andrium in ventral view; 82 & 83: posterior and anterior part of gonostylus; 84: inner copulatory organ; 85: aedeagus and gonites; 86: aedeagus; 87: pregonite and postgonite; 88: male postabdomen in lateral view. For abbreviations see p. 26.







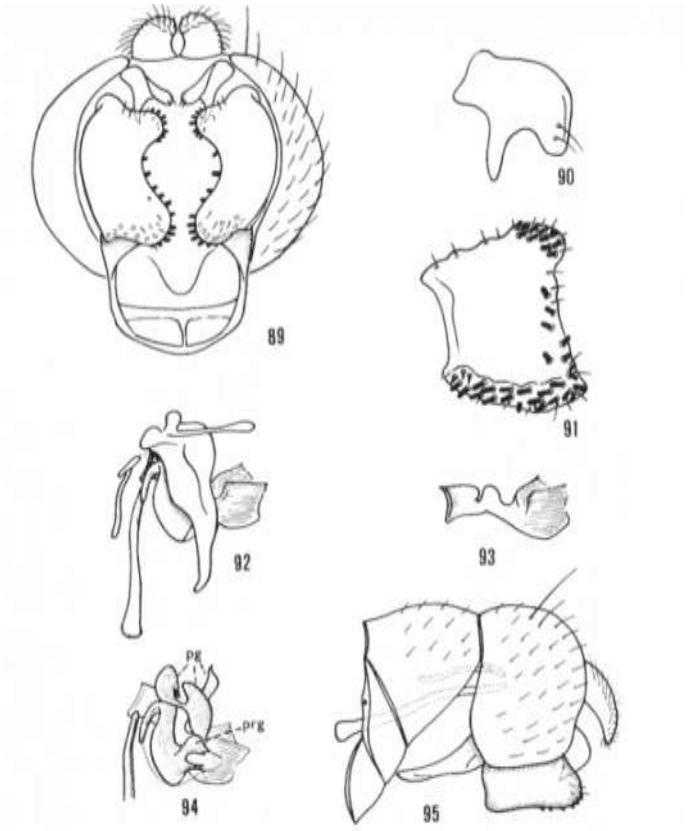
Colobaea punctata (Lundbeck, 1923)

Crenulus punctatus Lundbeck, 1923: 106.

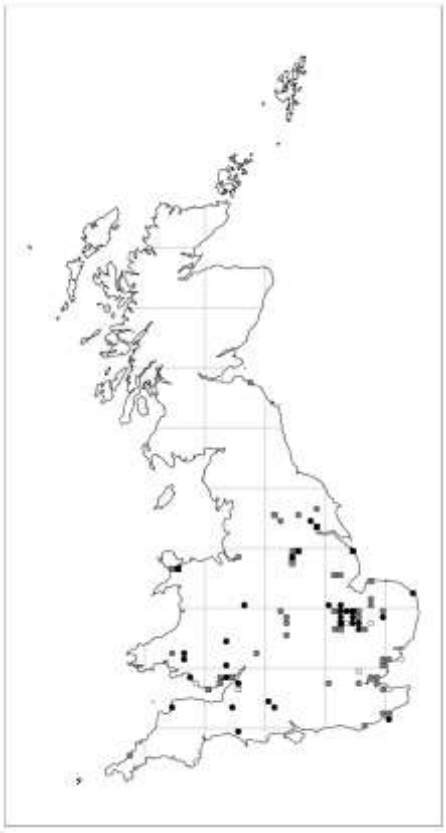
Description: Closely related to *C. pectoralis*. Ground-colour virtually the same, i.e.- greater part of pleura, including notopleura, and lateral margins of abdominal terga yellow. Dark subnotopleural stripe on upper margin of mesopleuron reduced to a rounded black spot just below anterior notopleural seta. Fore femora also often darkened at base, and abdominal terga usually with narrowly yellow posterior margins. Abdominal sterna also extensively yellow. Male genitalia of the same type as in *C. pectoralis* but posterior part of gonostyli distinctly bifid apically and anterior part of gonostyli forming two inner lobes. Posterior process of hypandrium very slender, and aedeagal appendages also different. Length; body 2.0-3.5 mm, wing 1.8-3.3 mm.

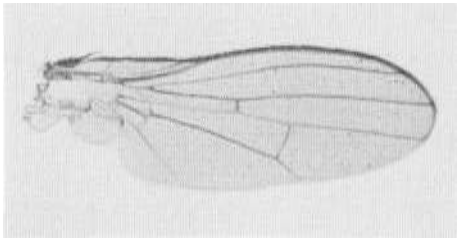
Distribution: A Eurasian species, known from southern Fennoscandia and the Baltic states south to Spain and from Ireland east through central Europe to Pakistan and Siberia; also Ethiopia. Local in England and Wales, beside ponds and ditches with summer draw-down in water levels. '**Notable**' according to Falk (1991). Recorded from 7 hectads before 1980 and 77 hectads since.

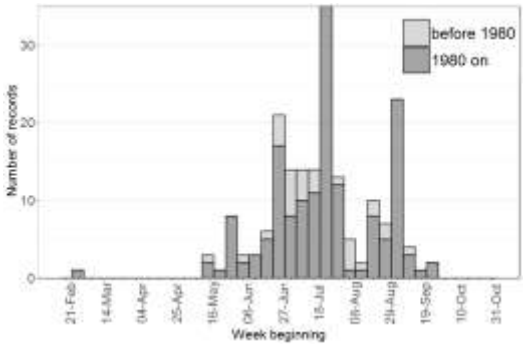
Biology: Found in open, sparsely vegetated margins of ponds and lakes with fluctuating water-levels and along slow-flowing drainage ditches. The larva is an internal parasitoid of a variety of snails including *Gyraulus albus*, *Lymnaea peregra*, *Radix labiata* and young *Planorbarius corneus*. The puparium was illustrated by Lundbeck (1923). The flight period extends from late May to September. Probably two generations per year.



Figs. 89-95. *Colobaea punctata* (Lundb.) – 89: andrium in ventral view; 90 & 91: posterior and anterior part of gonostylus; 92: inner copulatory organ; 93: aedeagus; 94: aedeagus and gonites; 95: male postabdomen in lateral view. For abbreviations see p. 26.







Genus *Ditaeniella* Sack, 1939

There have been many attempts to split up the large genus *Pherbellia* in which this species was previously placed (e.g. five genera were recognised, including this concept of *Ditaeniella*, in Kloet & Hincks 1945). The group of species including *grisescens*, together with the Nearctic *parallela* (Walker) and the Neotropical *paragonensis*, seems to be the most isolated and was restored to generic status by Rozkošný (1987), accepted by Vala (1989) and in the most recent British list (Chandler, 1998 - update of Oct 2016). These species have only one orbital seta, a haired prosternum and posterior inner margin of hind coxae, haired sternum 7, reduced gonostyli, and strong spines on the postgonites. All other species of *Pherbellia* from northern Europe have two orbitals, a bare prosternum and posterior inner margin of hind coxae as well as sternum 7, well-developed gonostyli, and postgonites without any spines or hairs at all.

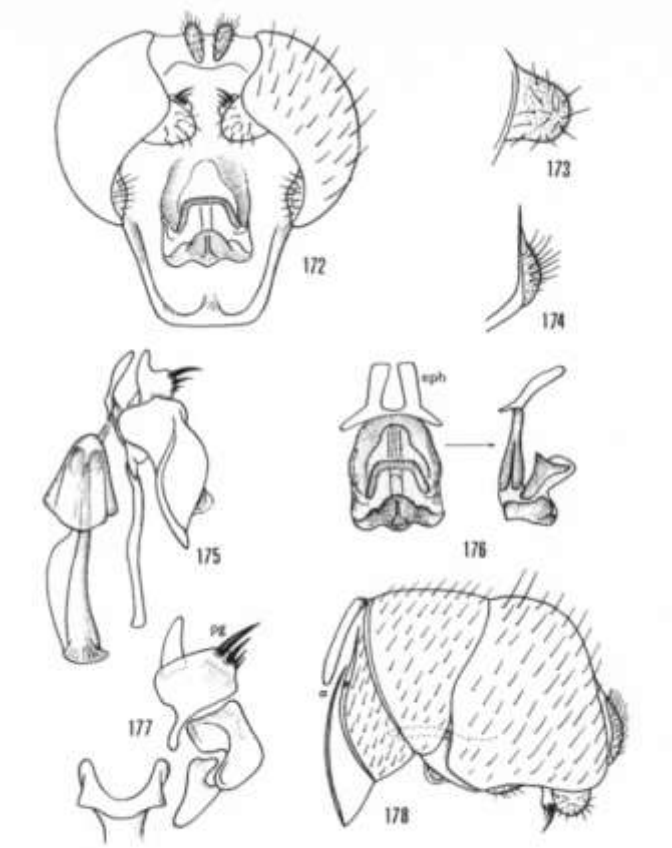
Ditaeniella grisescens (Meigen, 1830)

Sciomyza grisescens Meigen, 1830: 20.
Sciomyza nasuta Zetterstedt, 1846: 21 14.
Sciomyza brevipes Loew, 1856: 54.
Sciomyza propinqua Thomson, 1869: 570.

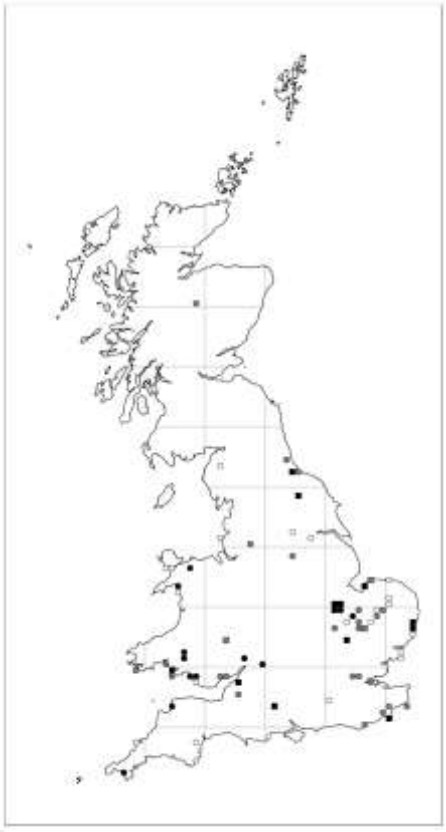
Decsription: A very isolated species characterised by having only one orbital seta, and by the haired prosternum, entire mesopleuron and inner posterior margin of hind coxae. Apically pointed mid-frontal stripe usually reaching anterior margin of frons. Arista short pubescent, third antennal segment darkened in apical half. Head mainly yellow, thorax and abdomen mainly yellowish-grey, mesonotum with darker stripes. Legs yellow, tips of fore tibiae and fore tarsi darkened. Pteropleuron with several hairs and two rather strong setae. Both parts of gonostyli reduced. Ejaculatory apodeme long and massive, with an extensive dorsal ridge. Postgonites with 3-4 strong spines, epiphallus bipartite. Unlike other species of the genus, sternum 7 of the male abdomen haired. Length: body 3.2-4.5 mm, wing 3.6-4.2 mm.

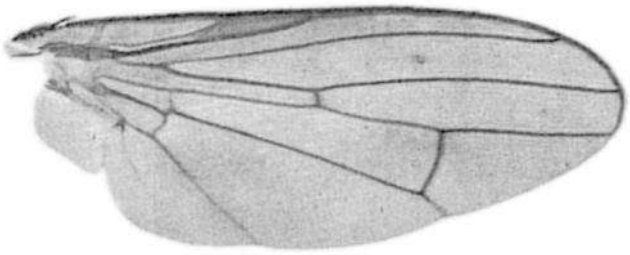
Distribution: A Palaearctic and Oriental species, known to occur from Iceland, Lapland and Franz Joseph Land to North Africa (Egypt), Lebanon, Iran and Afghanistan, throughout Soviet Central Asia, Mongolia and China to the Far East (map: Bratt *et al*., 1969). Very local in a wide range of wetland habitats throughout Britain. 'Rare' (RDB3) according to Shirt (1987), but reassessed as '**Notable**' by Falk (1991). Recorded from 23 hectads before 1980 and 52 hectads since.

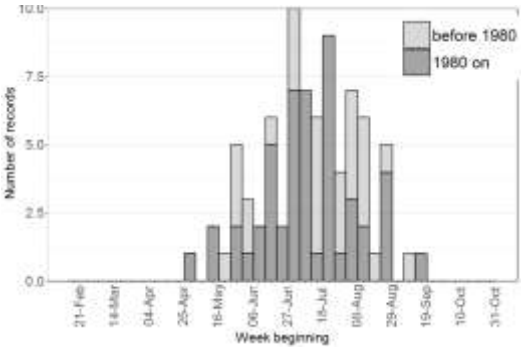
Biology: Adults are locally frequent in damp and wet habitats, either shaded or exposed, but may also occur in strictly terrestrial habitats. The larvae killed and consumed a wide variety of aquatic and terrestrial snails from many families in the laboratory. The larval stage lasted 7-9 days, and the pupal period 6-11 days. The larvae pupate mainly outside the host shell. The species probably overwinters in the puparium. About 5-7 generations may develop in one year. All immature stages were described by Bratt *et al*. (1969). Flight period from late May to late August or September.



Figs. 172-178. *Pherbellia grisescens* (Meig.). – 172: andrium in ventral view; 173 & 174: posterior and anterior part of gonostylus; 175: inner copulatory organ; 176: aedeagus in ventral and lateral view; 177: pregonite and postgonite; 178: male postabdomen in lateral view. For abbreviations see p. 26.







Genus *Pherbellia* Robineau-Desvoidy, 1830

Pherbellia Robineau-Desvoidy, 1830: 695.
Type-species: *Pherbellia vernalis* Robineau-Desvoidy, 1830 (= *Sciomyza schoenherri* Fallen, 1826) (mon.).
Chetocera Robineau-Desvoidy, 1830: 697.
Type-species: *Chetocera claripennis* Robineau-Desvoidy, 1830 (= *Sciomyza albocostata* Fallen, 1820a) (mon.).
Ditaenia Hendel, 1902a: 66.
Type-species: *Sciomyza cinerella* Fallén, 1820a (subseq. des. by Cresson, 1920: 49).
Oxytaenia Sack, 1939: 39.
Type-species: *Sciomyza brunnipes* Meigen, 1838 (orig. des.).

Small to medium sized flies with yellow, brown or greyish ground-colour. Frontal mid-stripe short, elongated or even band-shaped. Propleural seta usually strong and prosternum bare. Mesopleuron entirely bare, sometimes haired along posterior margin or on greater part of its surface. Pteropleuron with several bristle-like hairs and often with 2 more or less distinct setae. Sternopleuron haired, but some upper hairs

elongated in the *brunnipes*-group. Inner posterior margin of hind coxae bare. Fore tibiae with only one preapical seta, as on other tibiae. Vein R_1 of varying lengths in the different species-groups, anal vein always complete, reaching wing margin. Male genital structures different in individual species, but anterior pan of gonostyli without short and thickened setae. Epiphallus only small or absent in the *ventralis*-group and *brunnipes*-group, paraphallus well-developed in the *dorsata*- and *griseicollis*-group. Pregonites and postgonites well-separated, postgonites even duplicated in some species.

There is still no real agreement about the subdivision of the large genus *Pherbellia* into subgenera or species-groups, though several attempts have been made. Most of the species-groups erected on the basis of adult characters have also been confirmed by the larval features (cf. Bratt *et al*., 1969), but there are still differences of opinion, particularly as regards the number and the extent of species-groups within the subgenus *Chetocera* R.-D. sensu Rozkošný (1964). At least a *brunnipes*-group (*brunnipes*, *stackelbergi*), *dorsata*-group (*dorsata*, *griseola*, *obtusa*), *griseicollis*-group (*griseicollis*, *sordida*) and *ventralis*-group (*ventralis*, *obscura*, *rozkosnyi*, and *scutellaris*) can be defined. The other species seem to be more isolated, though they may form species-groups with species from other areas or regions.

The biology and immature stages of *Pherbellia* were studied in detail by Bratt *et al*. (1969). The larvae live as parasitoids of exposed aquatic or terrestrial pulmonate snails, though some larvae show more predacious behaviour especially during the third instar. Host specificity is known in several larvae living in terrestrial habitats. Puparia may be formed inside or outside the host snail. Some species that pupate inside the shells of aquatic snails form a plate-like septum that closes off the whorl of the shell. This calcareous septum is formed by the larva before pupation, from an excretion of its Malpighian tubules.

In the Palaearctic region a total of 42 species has been described, and 18 are known to occur in the British Isles although one, *P. stackelbergi*, has so far only been recorded in Ireland.

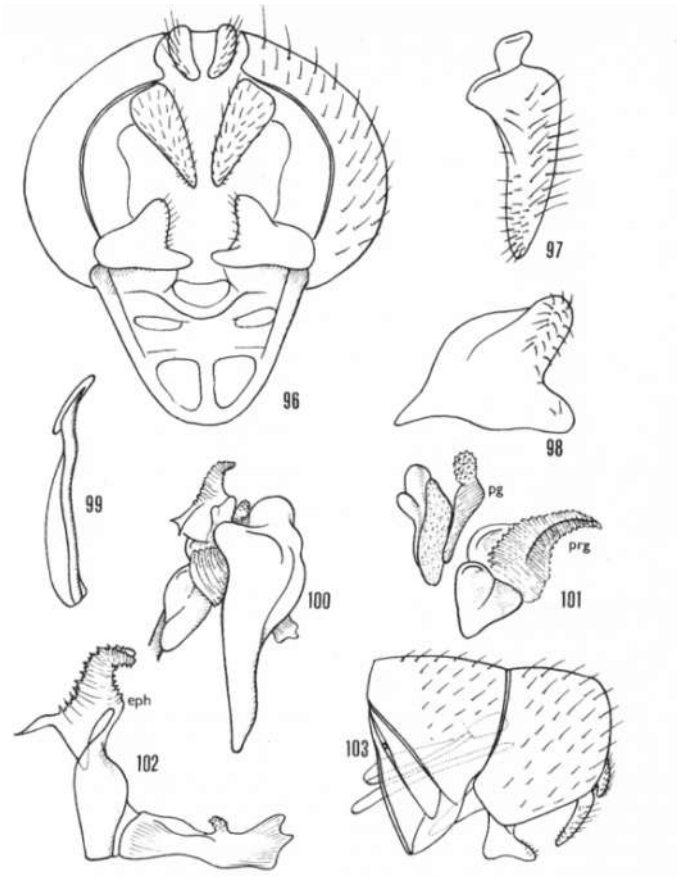
Pherbellia albocostata (Fallén, 1820)

Sciomyza albocostata Fallén, 1820a: 12.
Chetocera claripennis Robineau-Desvoidy, 1830: 697.

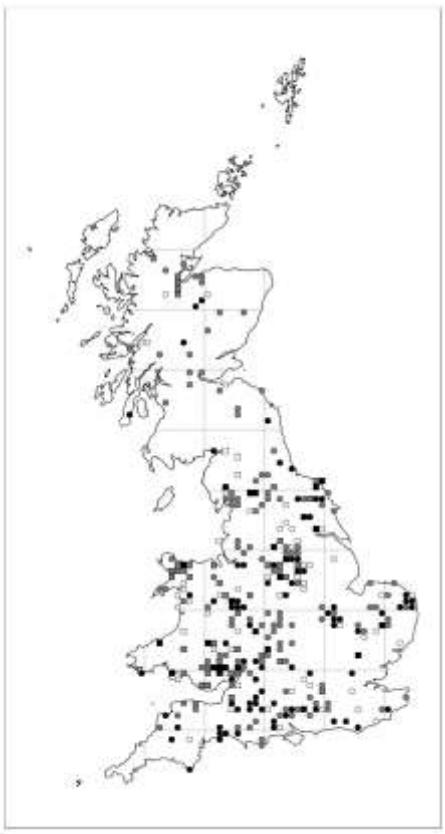
Description: A relatively pale, mainly reddish-yellow to yellowish-brown species. The short-plumose arista and several rows of mesopleural hairs along posterior margin of mesopleuron suggest a relationship with the *dorsata*-group. Fore legs brownish-black in females but yellowish in males, Wings strikingly bicoloured, with whitish band along costal border, anterior veins (Sc, R_1 and R_{2+3}) pale yellow. Pteropleuron with some subequal hairs but without stronger setae. Characters of male genitalia resembling *P. dubia*, with a somewhat bilobate anterior part of gonostyli, transversely ridged pregonites and small paraphallus in middle of distiphallus. On the other hand, the epiphallus in also transversely ridged and bifid apically, postgonites bilobate, and ejaculatory apodeme with a dorsal dilation. Length: body 4.0-7.2 mm, wing 4.0-6.3 mm.

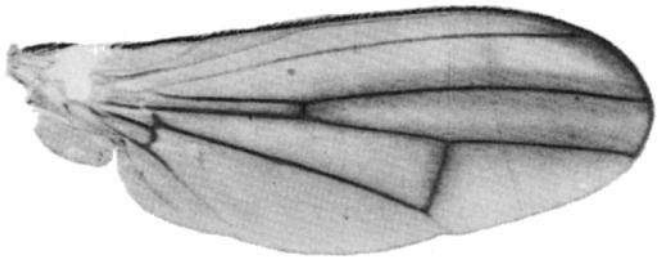
Distribution: Holarctic; in the Palaearctic region, widely distributed in North Europe; from Scandinavia south to the Pyrenees and Ireland east through most of Europe to Siberia and the Pacific (map: Bratt *et al.*, 1969); in North America ranging from western Alaska to Colorado and eastwards to Newfoundland. In damp, shaded woods throughout Britain. Recorded from 58 hectads before 1980 and 262 hectads since.

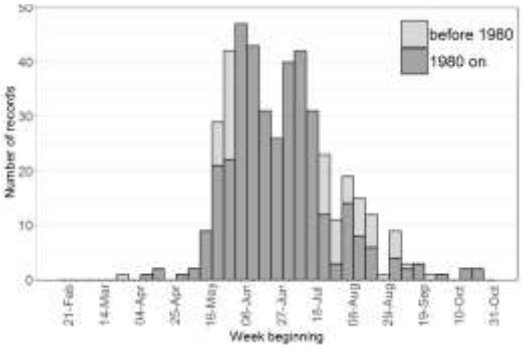
Biology: Inhabits damp woods, both deciduous and coniferous, and often occurs with *P. dubia*. Ringdahl (1957) found adults at 1000 m in the French Alps. The larvae feed as parasitoids mainly upon terrestrial gastropods of a wide range of species, but especially *Cochlicopa* and *Discus* spp. The larval stage lasts 73-173 days, the pupal period 49 days, and the puparium is the overwintering stage. The puparium is usually formed outside the host shell, among dead leaves, under moss and in litter. Probably univoltine. All immature stages were described and illustrated by Bratt *et al*. (1969). Flight period from end of May to late August or early September.



Figs. 96-103. *Pherbellia albocostata* (Fall.). – 96: andrium in ventral view; 97 & 98: posterior and anterior part of gonostylus; 99: ejaculatory apodeme; 100: inner copulatory organ; 101: pregonite and postgonite; 102: aedeagus; 103: male postabdomen in lateral view. For abbreviations see p. 26.







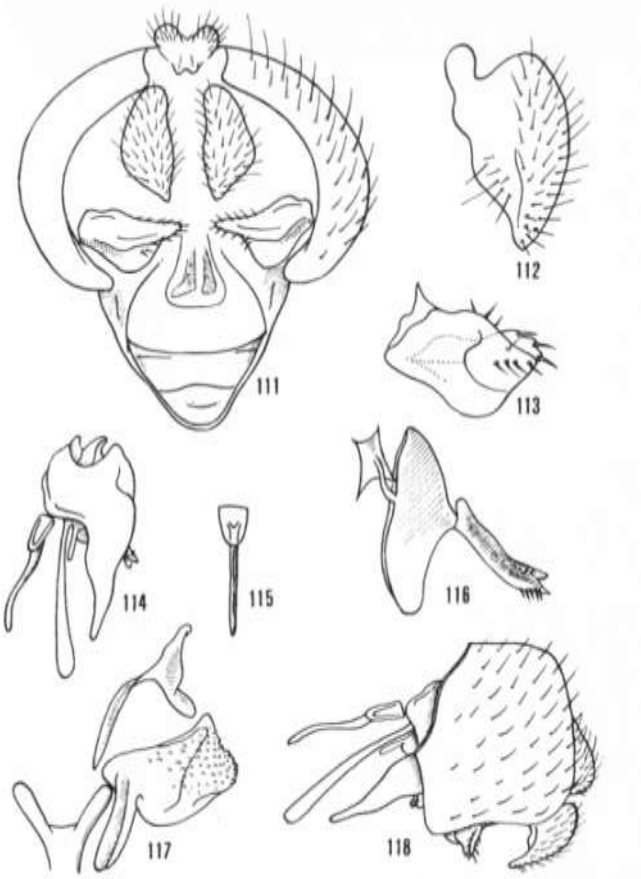
Pherbellia annulipes (Zetterstedt, 1846)

Sciomyza annulipes Zetterstedt, 1846: 2113.

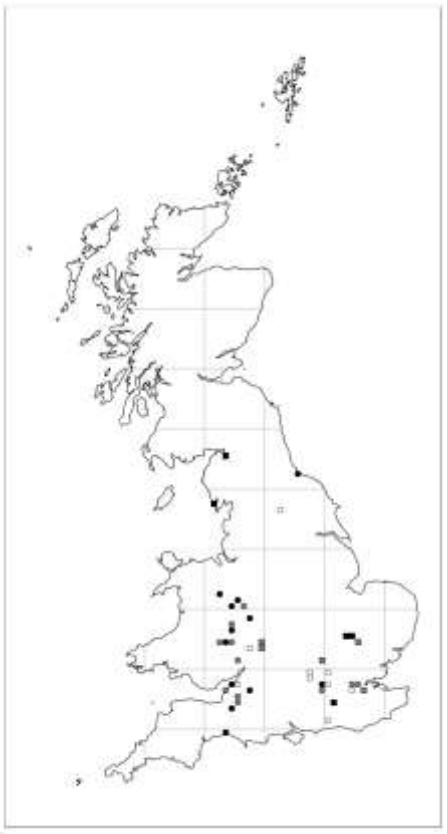
Description: According to external characters related to *P. nana*, with bare mesopleuron and characteristic dark rings near tips of middle and hind femora and tibiae. The greyish-brown ground-colour is also similar and so is the short-pubescent arista, but the cheeks are unusually narrow, hardly as broad as third antennal segment. Wings without any special pattern, somewhat darkened only along costal border and at cross-veins. Posterior part of gonostyli simple and stout, anterior part with a row of relatively strong setae. Aedeagus with small epiphallus and conspicuously broad basiphallus. Pregonite with transverse rows of small warts and postgonite rather slender. Length: body 3.4-5.3 mm, wing 3.2-4.8 mm.

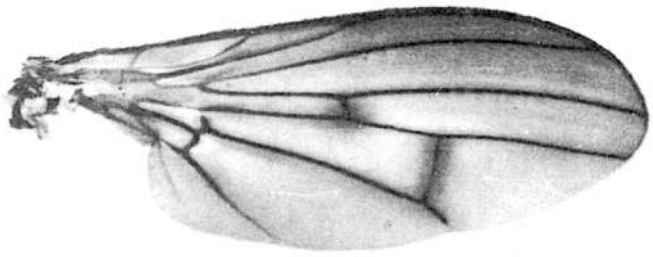
Distribution: A European species, extending from southern Scandinavia south to the Mediterranean (Corsica), and from Britain eastwards through southern and central Europe to the former Yugoslavia (map: Bratt, *et al*., 1969). Rather local from southern England and Wales, adults on mossy tree trunks in ancient woodlands. Recorded from 10 hectads before 1980 and 33 hectads since. '**Notable**' according to Falk (1991).

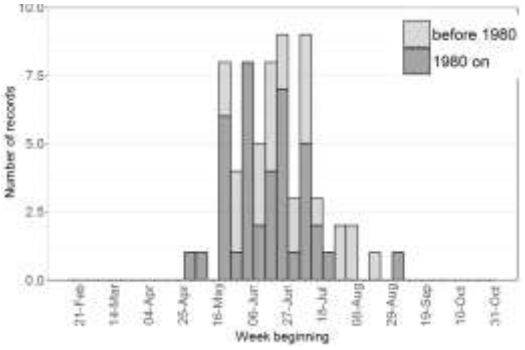
Biology: The species is sometimes common in open deciduous woods, especially of Beech or alluvial Alder woods. In the laboratory, the larvae attacked *Discus rotundatus* and behaved as parasitoids. After 14-23 days the larvae pupated within the empty shell of the second snail that they had killed and consumed. Univoltine, over-winters as a puparium within the host shell. All immature stages were described by Bratt *et al*. (1969). The flight period extends from the middle of May to late August.



Figs. 111-118. *Pherbellia annulipes* (Zett.). – 111: andrium in ventral view; 112 & 113: posterior and anterior part of gonostylus; 114: inner copulatory organ; 115: ejaculatory apodeme; 116: aedeagus; 117: pregonite and postgonite; 118: andrium in lateral view.







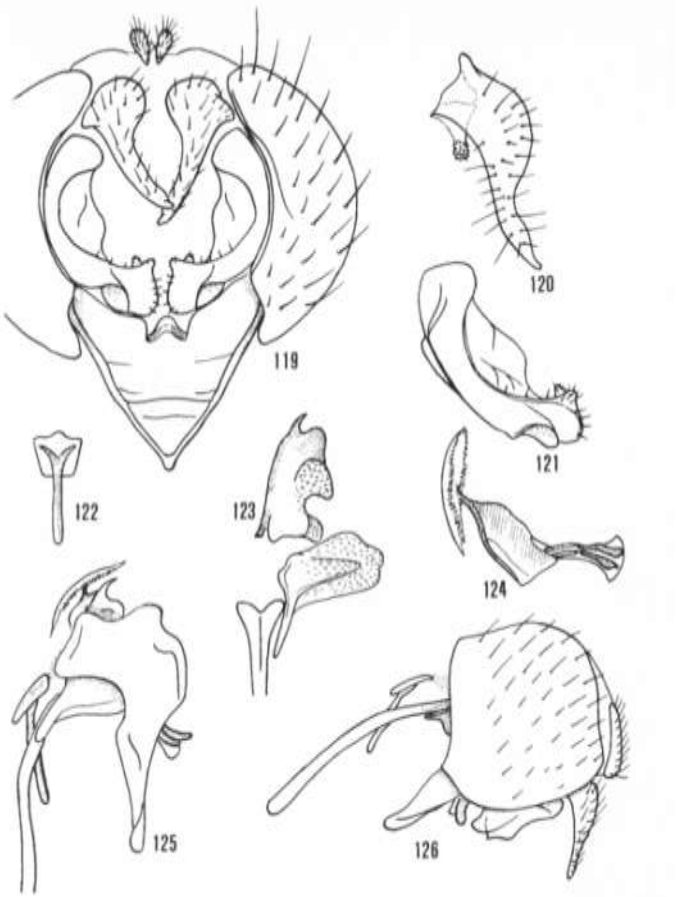
Pherbellia argyra Verbeke, 1967

Pherbellia argyra Verbeke 1967a: 4.
Sciomyza obtusa auct. nec Fallén, 1820a: 13.

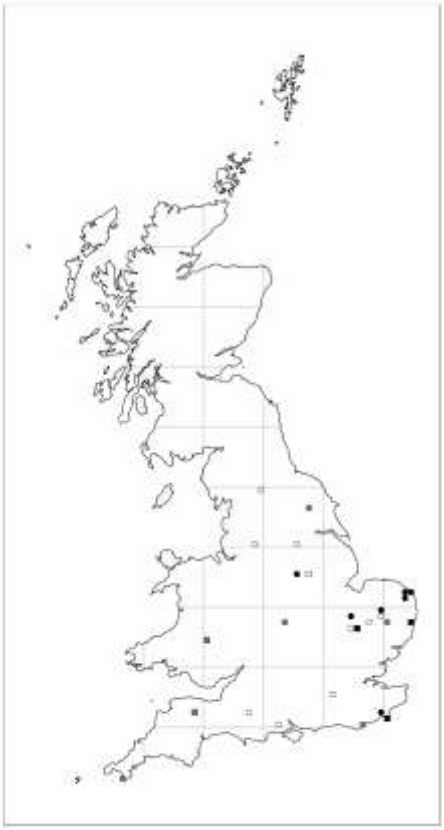
Description: A species with short mid-frontal stripe, bare mesopleuron and silvery pruinose (males) or whitish pruinose (females) anterior margin of frons. Arista short-plumose, longest hairs equal to nearly half width of third antennal segment. Mesonotum dark brown, yellowish pollinose, notopleura paler, pleura greyish pollinose but upper half of mesopleuron brown. Pteropleuron haired, with two distinct setae. Posterior part of gonostyli with short basal process; epiphallus large and fringed at margin, paraphallus absent, and distiphallus as in the dorsata-group, i.e. strengthened with elongated plates. Length: body 4.0-5.8 mm, wing 4.0-5.2 mm.

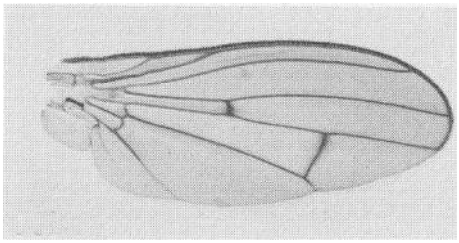
Distribution: Holarctic; in Europe from Lapland south to the Pyrenees and Ireland eastwards through central Europe to Russia; in North America ranging from western Alaska to Nevada, and eastwards to Massachusetts. In England and Wales typically found on grazing marshes beside ditches. Recorded from 10 hectads before 1980 and 17 hectads since. '**Vulnerable**' (RDB2) according to Falk (1991).

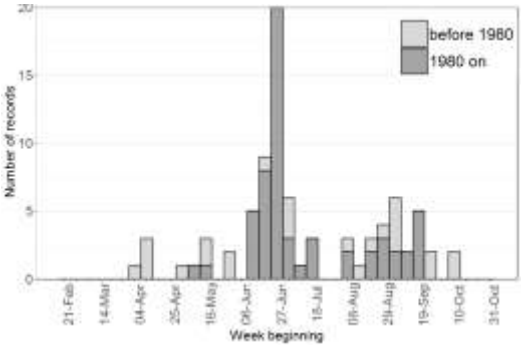
Biology: Adults occur at the edges of permanent ponds, in marshes and other aquatic situations with widely fluctuating water levels. Larvae have been found in *Aplexa hypnorum* and *Planorbis planorbis*, and the puparia in floating shells of *P. planorbis* and of *Anisus vortex*. The larvae thus live as parasitoids of aquatic pulmonate snails. The larval stage lasts 11-15 days, and the pupal stage 7-17 days. Polyvoltine, over-winters as a puparium which may be formed either within a host shell or outside it in the substrate. All immature stages were described by Bratt *el al*.(1969). Flight period from June to September.



Figs. 119-126. *Pherbellia argyra* Verb. – 119: andrium in ventral view; 120 & 121: posterior and anterior part of gonostylus; 122: ejaculatory apodeme; 123: pregonite and postgonite; 124: aedeagus; 125: inner copulatory organ; 126: andrium in lateral view.







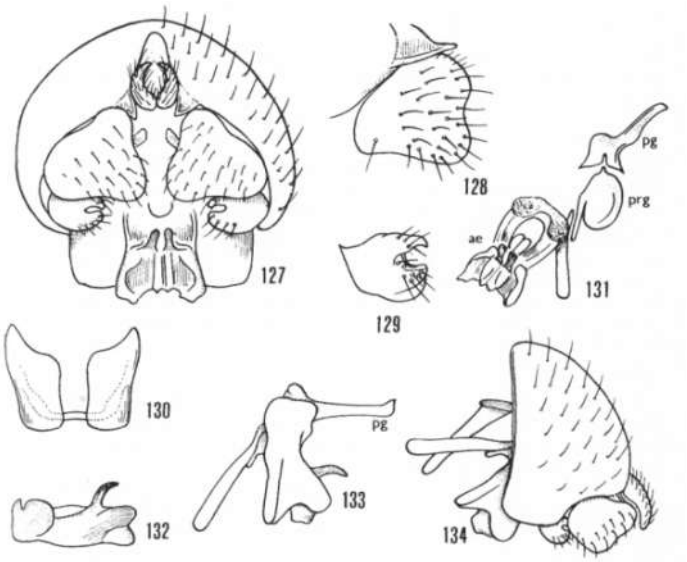
Pherbellia brunnipes (Meigen, 1838)

Sciomyza brunnipes Meigen, 1838: 364.
Sciomyza pusilla Zetterstedt, 1838: 739.
Sciomyza coxata Zetterstedt, 1838: 739.
Ditaenia uliginosa Enderlein, 1939: 207.

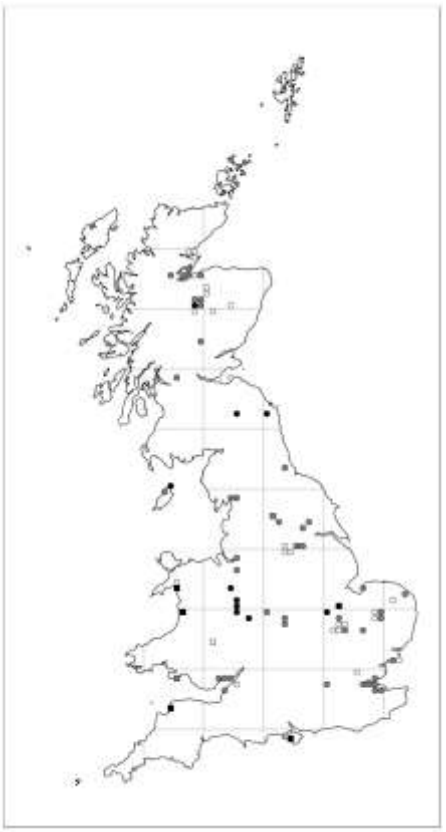
Description: A species with an elongate-triangular mid-frontal stripe, usually reaching anterior margin of frons. Orbital plates, narrow margin of frons along eyes, occiput and mesonotum intensely greyish pollinose. Arista only short-pubescent. A row of small hairs distinct close to eye-margin but not continuing on to the space between anterior orbital seta and anterior margin of frons. Mesopleuron completely bare, pteropleuron with 5-7 subequal hairs, sternopleuron haired and with 2 long setae at upper margin. Fore femora and tibiae darkened, both cross-veins distinctly infuscated. Male genitalia very characteristic: posterior part of gonostyli large and rounded on inner side postgonites characteristically elongated, aedeagus broad and without distinct epiphallus and paraphallus. Length: body 2.2-2.7 mm, wing 2.0-2.5 mm.

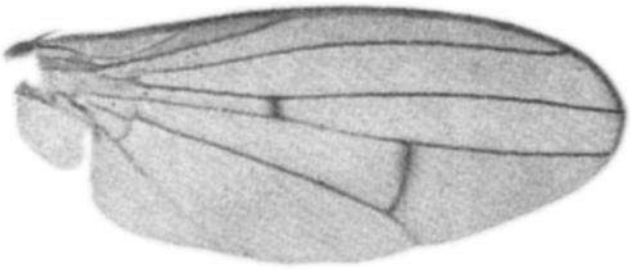
Distribution: In Europe, from Scandinavia and the Baltic states south to France and Ireland eastwards through northern and central Europe to Russia and the Ukraine (map: Bratt *et al*., 1969). Also Mongolia. Local throughout Britain in fens and also other wetlands. Recorded from 25 hectads before 1980 and 60 hectads since. '**Notable**' according to Falk (1991).

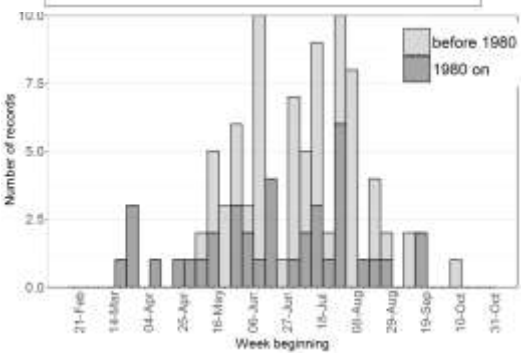
Biology: The species has been collected in exposed fens and marshes at the margins of vernal pools and ponds. Laboratory rearing of the larvae was not successful. The species overwinters as a puparium away from the host, and the free-floating puparia can be collected at the edges of standing water in spring. The third-instar larva and puparium were described by Bratt *et al*. (1969). The flight period extends from April to September.



Figs. 127-134. *Pherbellia brunnipes* (Meig.). – 127: andrium in ventral view; 128 & 129: posterior and anterior part of gonostylus; 130: hypandrium in ventral view; 131: aedeagus, pregonite and postgonite; 133: inner copulatory organ (without ejaculatory apodeme); 134: andrium in lateral view. For abbreviations see p. 26.







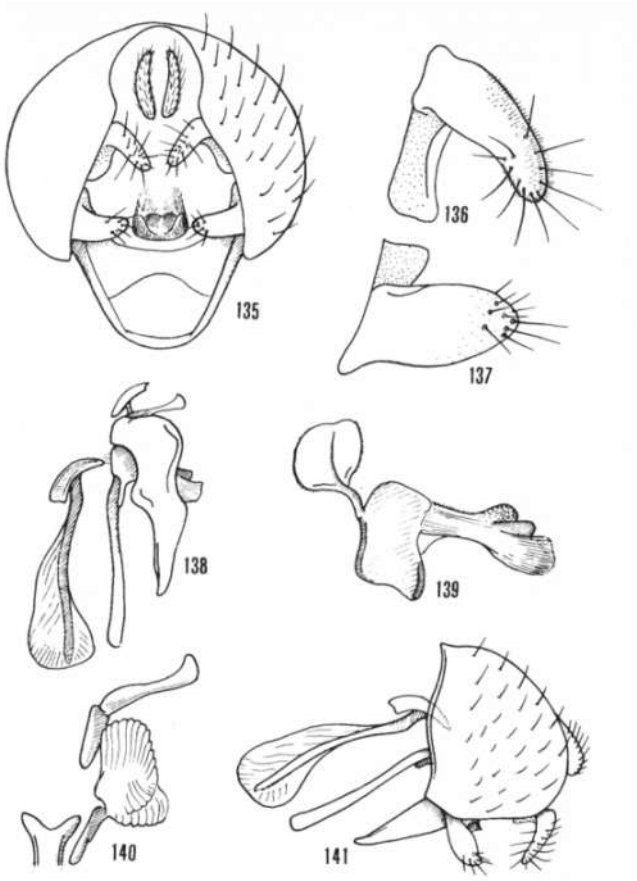
Pherbellia cinerella (Fallén, 1820)

Sciomyza cinerella Fallén, 1820a: 14.

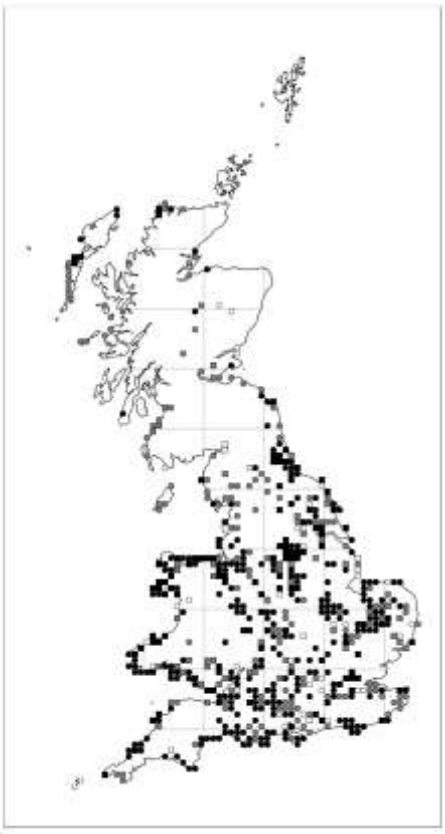
Description: One of the best characterised species of the genus, with a shining brown to black band-shaped mid-frontal stripe reaching anterior margin of frons and a dark costal border on wings. Third antennal segment black, arista distinctly pubescent. A black and silvery pollinose spot on each side at eye-margin at level of antennae. Body mainly brown, fore legs often almost black except for coxae, other legs yellow. Cross-veins darkened. Both parts of gonostyli relatively slender, simple. Ejaculatory apodeme long, with an extensive ridge. Postgonite elongated as in the *brunnipes*-group. Aedeagus with a broad epiphallus. Length: body 3.0-6.2 mm, wing 3.0-5.6 mm.

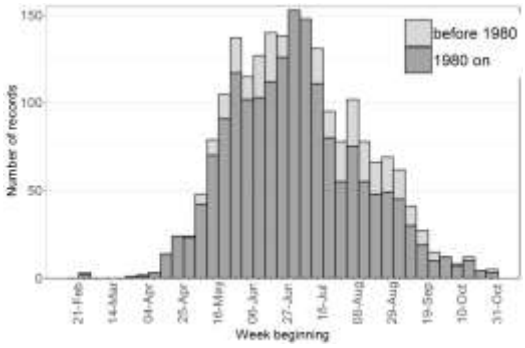
Distribution: Palaearctic and Oriental; in Europe extending from Lapland south to the Mediterranean and North Africa and Ireland eastwards through most of central Europe to Russia; Turkey, Tajikistan and Afghanistan to the Oriental Region (map: Bratt *et al*., 1969). Very common on calcareous grasslands, coastal dunes and in wetlands throughout Britain. Recorded from 41 hectads before 1980 and 554 hectads since.

Biology: This species occurs in a wide variety of freshwater and terrestrial habitats, often in dry grasslands including calcareous grasslands and dunes, but also fens and marshes in non-flooded or seasonally flooded areas and can be abundant in salt marshes. In the laboratory, the host-range of larvae is very broad and includes both terrestrial and aquatic pulmonate snails of various genera, but has not been found in nature. The larval stage lasts 10-13 days, and the pupal period 10-16 days. The puparia are usually formed outside the host shell. Polyvoltine, over-winters as a puparium, but according to Vala (1989), can overwinter as an adult in southern France. All immature stages were described by Bratt *et al*. (1969). May be found almost any time of year and some early records are consistent with over-wintering adults.



Figs. 135-141. *Pherbellia cinerella* (Fall.). – 135: andrium in ventral view; 136 & 137: posterior and anterior part of gonostylus; 138: inner copulatory organ; 139: aedeagus; 140: pregonite and postgonite; 141: andrium in lateral view.





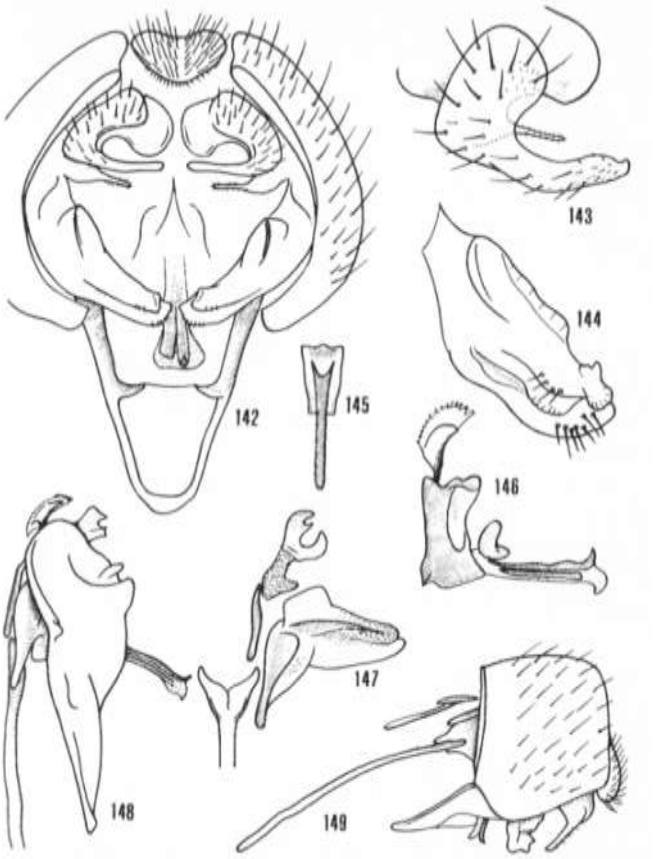
Pherbellia dorsata (Zetterstedt, 1846)

Sciomyza dorsata Zetterstedt, 1846: 2096.

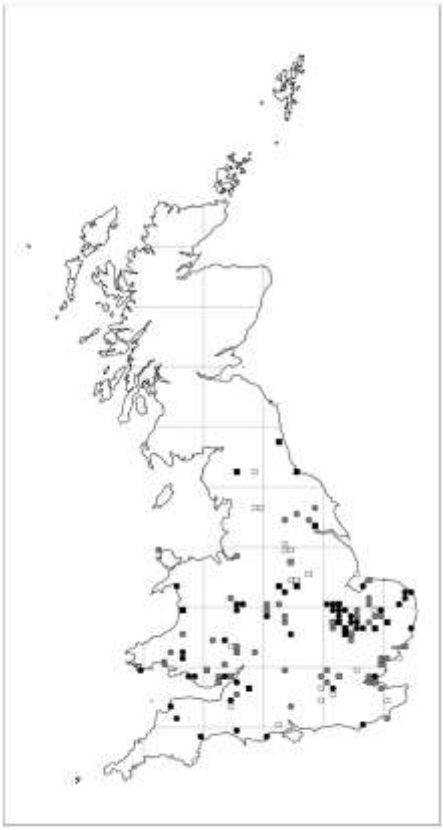
Description: A typical species of the *dorsata*-group with several hairs along the posterior margin of the mesopleuron. Ground-colour yellowish-brown, mesonotum darkened, lower pleura extensively greyish pollinose. Fore legs usually as pale brown as other pairs, not darkened. Mid-frontal stripe short and triangular. Arista long-plumose, some dorsal hairs nearly as long as third antennal segment is wide. Pteropleuron haired but 2 strong setae also present, sternopleuron with normal hairs. Posterior pan of gonostyli characteristically curved, with a thin inner process. Epiphallus with a fringed margin, postgonite trifid apically and paraphallus well-developed at base of distiphallus. Length: body 4.6-6.0 mm, wing 4.8-5.7 mm.

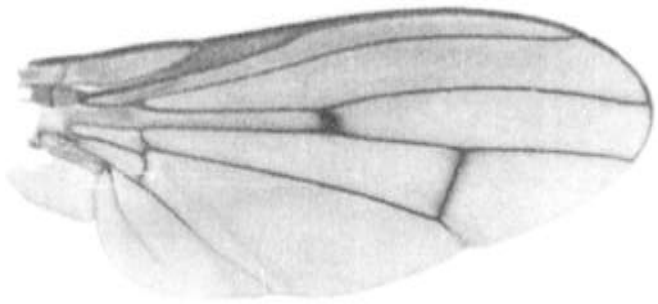
Distribution: A Eurasian species, occurring from central Sweden south to Spain, and Ireland eastwards to the former Yugoslavia and Turkey, Kazakhstan and western Siberia (map: Bratt *et al*., 1969). England and Wales, typically in fens and grazing marshes. Recorded from 23 hectads before 1980 and 109 hectads since. '**Notable**' according to Falk (1991).

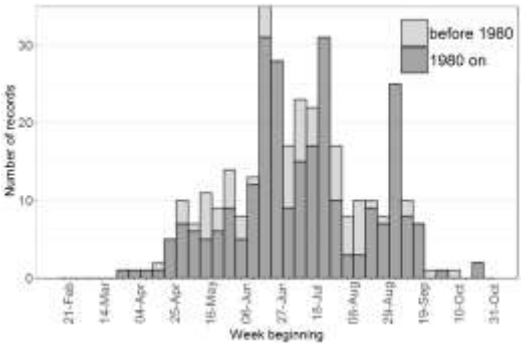
Biology: This species breeds in permanent aquatic habitats of various types, in both open marshes or fens and around the vegetated margins of pools within woodland. In the laboratory, larvae will attack a wide range of terrestrial and aquatic pulmonate snails, but in the field it has been reared only from *Planorbis planorbis*. The larval period lasts from 7 to 12 days, and the pupal period from 7 to 21 days. The puparium is formed within the host shell. There are 4-5 generations per year and over-wintering occurs in the puparium. All immature stages were described by Bratt *et al*. (1969). The flight period extends from late April or early May to early October.



Figs. 142-149. *Pherbellia dorsata* (Zett.). – 142: andrium in ventral view; 143 & 144: posterior and anterior part of gonostylus; 145: ejaculatory apodeme; 146: aedeagus; 147: pregonite and postgonite; 148: inner copulatory organ (without ejaculatory apodeme); 149: andrium in lateral view.







Pherbellia dubia (Fallén, 1820)

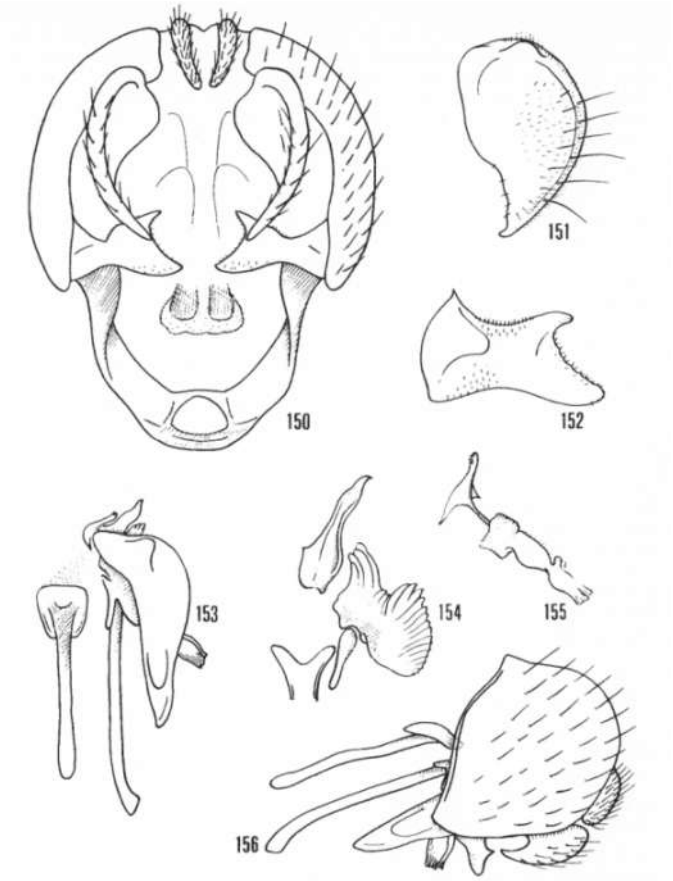
Sciomyza dubia Fallén, 1820a: 13.
Sciomyza rufa Zetterstedt, 1846: 2116.
Pherbellia caparti Verbeke, 1967b: 8.

Description: *P. dubia* differs from all other species of the genus by the black apical half (or more) of the third antennal segment. Arista pubescent, its hairs about as long as arista is wide at base. Mid-frontal stripe somewhat elongated, often reaching middle of frons. Thorax and abdomen mainly yellowish-brown, mesonotum more greyish. Mesopleuron completely bare, pteropleuron with 3-7 subequal hairs. Tips of fore tibiae and fore tarsi darkened. Posterior part of gonostyli large, markedly arched on outer side, anterior part bilobed externally. Inner copulatory organ resembling that of *P. albocostata*: pregonites transversely ridged, postgonites simple, epiphallus triangular, a small paraphallus in middle of distiphallus. Ejaculatory apodeme without dorsal ridge. Length: body 3.4-6.2 mm, wing 3.2-6.6 mm.

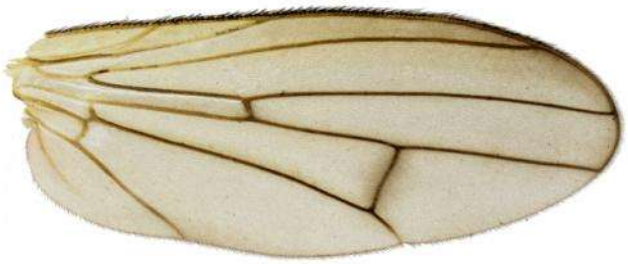
Distribution: A Eurasian species, extending from Lapland south to northern France and Ireland eastwards through central Europe (Switzerland, Alps) to Romania and European Russia, in Asia from Kazakhstan through Siberia to Kamchatka, and Japan (map; Bratt *et al*., 1969). Common in damp, shaded woodlands throughout Britain. Recorded from 73 hectads before 1980 and 370 hectads since.

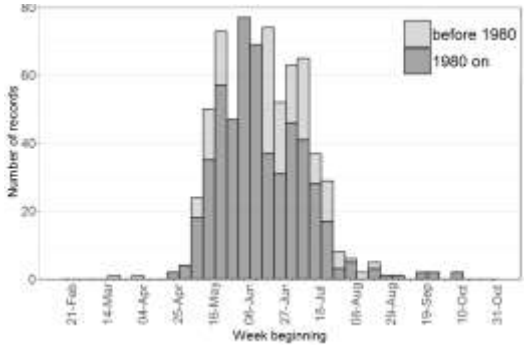
Biology: Adults are found in a wide range of damp habitats including deciduous and coniferous woodland, hedgerows and unimproved, non-flooded grassland. The larva has been reared in the laboratory from a wide range of terrestrial gastropods. In the field it has been reared from *Cochlicopa lubrica* and puparia found in snails of the genera *Cochlicopa*, *Discus*, *Hygromia, Oxychilus* and *Retinella* (Bratt *et al*., 1969) and in *Discus rotundatus* in Ireland (Chandler, 1972). The larval stage lasts for 31 to 61 days. The puparium is formed in the host shell. This apparently univoltine species overwinters in the pupal stage. All immature stages were described by Bratt *et al*. (1969). Adults occur from the beginning of May to late August.

Note: this species is rather similar in general appearance to *Renocera pallida* with which it shares the distinctive bi-coloured third antennal segment; It has a distinct propleural bristle, which is absent in *R. pallida* and other Tetanocerini. The bi-coloured third antennal segment also occurs in the rather rare *Sciomyza testacea*.



Figs. 150-156. *Pherbellia dubia* (Fall.). – 150: andrium in ventral view; 151 & 152: posterior and anterior part of gonostylus; 153: inner copulatory organ; 154: pregonite and postgonite; 155: aedeagus; 156: andrium in ventral view.





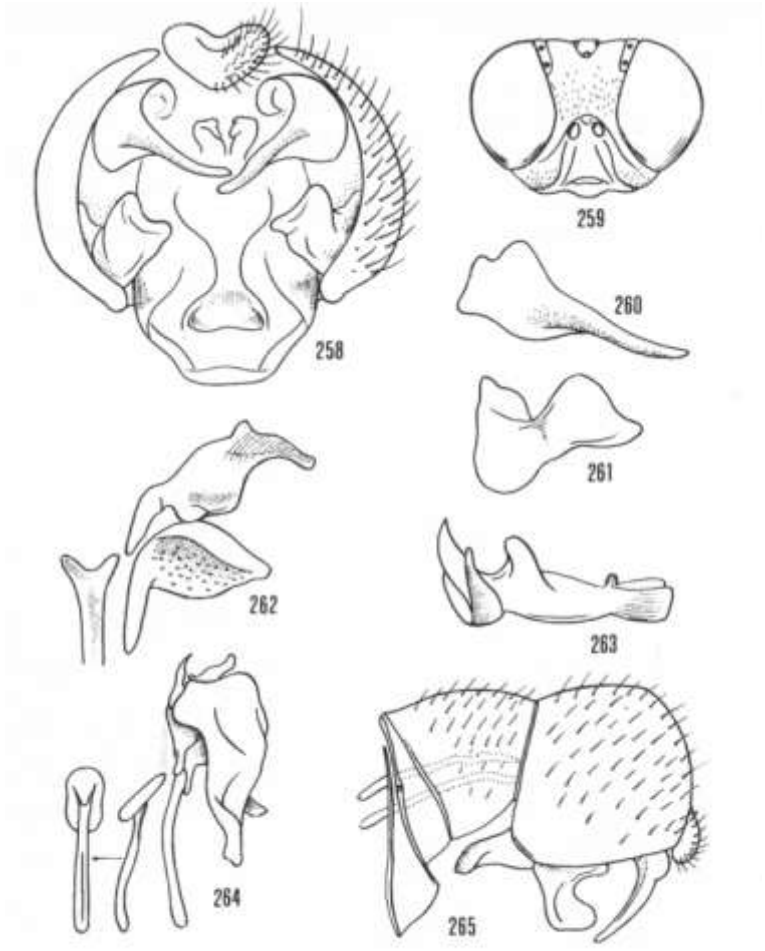
Pherbellia goberti (Pandellé, 1902)

Pherbellia goberti (Pandellé, 1902)
Pherbellia stylifera Rozkošný, 1982: 54.

Description: A species showing some affinity with *P. pallidiventris* but with quite characteristic male genitalia. Head almost flat anteriorly but markedly wide. Ground-colour yellow to yellowish-brown including mesonotum, thorax mainly shining. Mid-frontal stripe short, frons narrowed anteriorly (Fig. 259), cheeks narrow, arista short pubescent. Mesonotum yellowish pollinose, pleura mainly shining yellow. Mesopleuron entirely bare, pteropleuron with 6-9 bristle-like hairs. Fore legs dark brown in both sexes, basal part of fore femora in males more yellow. Wings hyaline, both cross-veins infuscated. Abdomen shining brownish-yellow. Posterior part of gonostyli long and slender in apical half, without distinct setae, and anterior part also virtually smooth. Ejaculatory apodeme moderately long, without any ridge. Pregonite and postgonite simple, well-separated. Epiphallus and a true paraphallus hardly developed. Length: body 4.4 mm, wing 4.0 mm.

Distribution: Sweden, Finland, the Netherlands, Germany, SW France. Added to the British list by Cole (2003) (as *P. stylifera*) from a pond margin surrounded by *Salix* carr at Godmanchester, Cambridgeshire in 1998.

Biology: unknown. Flight period, May to July according to Speight & Knutson (2012), but the British specimen was collected on August 18.



Figs. 258-265. *Pherbellia stylifera* Rozk. – 258: andrium in ventral view; 259: male head in frontal view; 260 & 261: posterior and anterior part of gonostylus; 262: pregonite and postgonite; 263: aedeagus; 264: inner copulatory organ; 265: male postabdomen in lateral view.

Pherbellia griseola (Fallén, 1820)

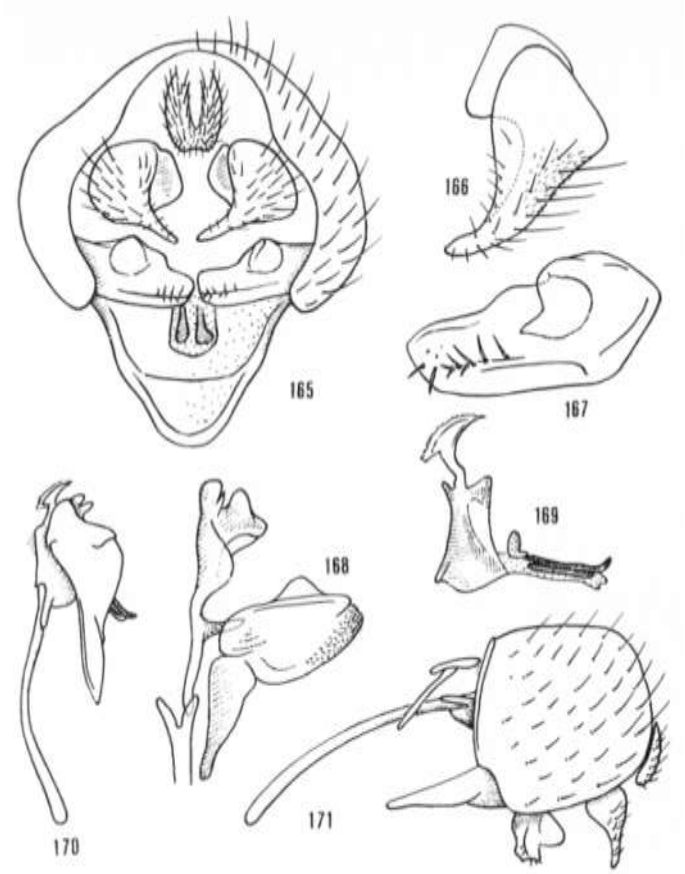
Sciomyza griseola Fallén, 1820a: l4.
Sciomyza fuscipes Macquart, 1835: 407.
Sciomyza rufipes Zetterstedt, 1846; 2097.
Sciomyza atripedella Boheman, 1864: 84.

Description: A species of the *dorsata*-group with several hairs along the posterior margin of the mesopleuron. Ground-colour rather variable, from yellowish-brown to dark brown, and the size also frequently very different. Mesonotum and lower pleura usually more greyish, narrow posterior margins of abdominal terga yellowish. Arista short-plumose, dorsal hairs hardly half the width of third antennal segment. Fore legs usually much darker than the other pairs. Pteropleuron with several hairs and 2-3 distinct setae. Male genitalia characteristic: posterior part of gonostyli with two inner processes, postgonites bilobed apically, epiphallus with a fringed margin, paraphallus well-developed, located at base of distiphallus, strip-like sclerotised plates of distiphallus distinct. Ejaculatory apodeme relatively short. Length: body 2.6-6.8 mm, wing 2.7-6.0 mm.

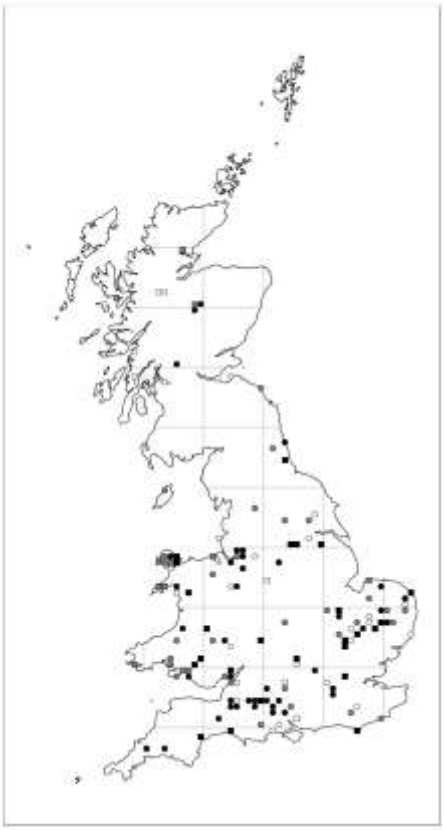
Distribution: Holarctic; in the Palaearctic region from Lapland south to Spain and North Africa (Tunisia), Ireland eastwards through most of Europe into European Russia; in Asia, Iran to Siberia, Mongolia, China and Japan (map: Bratt *et al*., 1969). Transcontinental in the Nearctic. Very local in a wide range of wetland habitats throughout Britain. '**Notable**' according to Falk (1991). Recorded from 30 hectads before 1980 and 108 hectads since.

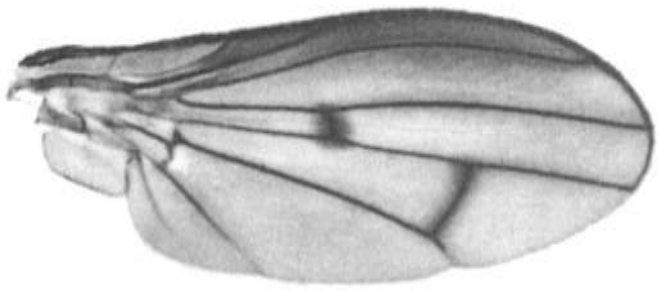
Biology: Adults occur in temporary and permanent marshes and swamps, and around ponds and other standing water with fluctuating water-levels. The larvae feed in exposed freshwater snails. In the laboratory, larvae will attack Lymnaeidae, Physidae, Planorbidae and Succineidae. In the wild, larvae and puparia have been found in *Stagnicola palustris*. The puparia are usually formed within the shell of the host snail, but occasionally outside it. The larval stage lasts for 8 to 11 days, and the pupal stage for 10 to 15 days. A polyvoltine species that probably over-winters as the puparium. The flight period is from mid-May to mid-September.

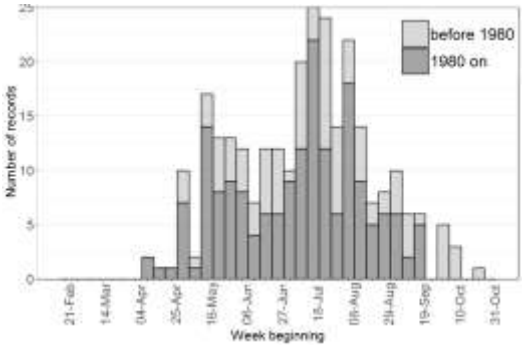
Note. *P. griseola* is highly variable in size and body colour. Large and pale specimens in particular can easily be confused with *P. dorsata*.



Figs. 165-171. *Pherbellia griseola* (Fall.). – 165: andrium in ventral view; 166 & 167: posterior and anterior part of gonostylus; 168: pregonite and postgonite; 169: aedeagus; 170: inner copulatory organ (without ejaculatory apodeme); 171: andrium in lateral view.







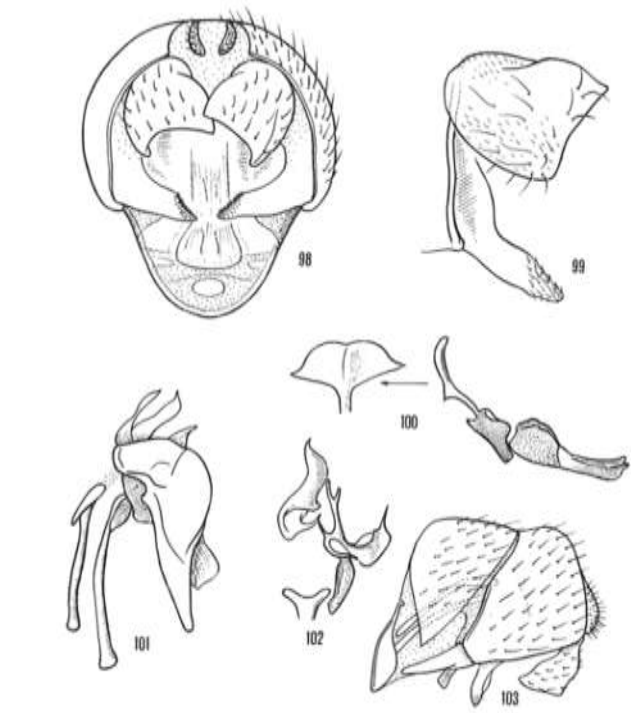
Pherbellia knutsoni Verbeke, 1967

Description: Mid frontal stripe whitish pruinose, narrowed anteriorly, reaching distinctly beyond the middle of the frons (measured from the front of the foremost ocelli). Arista only very short pubescent. Thorax greyish pruinose with 4 darker stripes on the mesonotum: humeri, notopleurae and scutellum more yellow. Mesopleuron bare, pteropleuron with 3-4 strong, bristle like hairs. Legs yellow, apical half of fore tibia, apical 4 tarsal segments on fore legs and apical 2 segments on hind legs darker brown. Fore basitarsi often whitish on greater part. Male genitalia: posterior part of gonostylus without proximal tip, pregonites with several pointed projections. Body length 5.0-6.2mm, wing length 4.3-4.6mm.

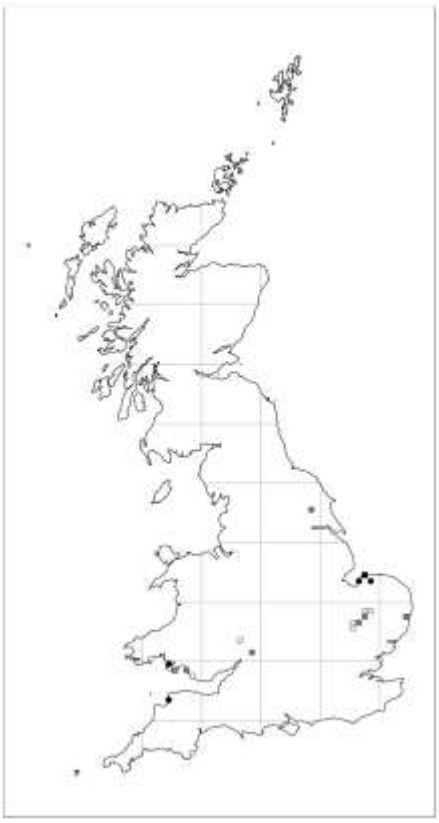
Distribution: A rare species that has been found only in Ireland, Great Britain, France (Brittany, Alps) and the Swiss Jura. Widely but very sparsely recorded in southern England and Wales. Most records are from chalk grassland, the Breck heathland of East Anglia or dry coastal dunes in South Wales. Accorded the status '**Rare'** (RDB3) by Falk (1991). Recorded from 8 hectads before 1980 and 12 hectads since.

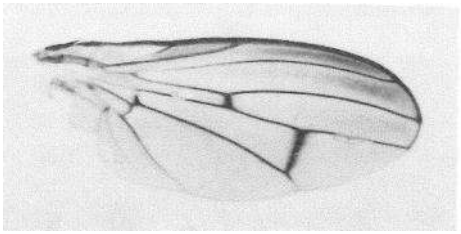
Biology: A species of dry, unimproved grassland. The larvae are internal parasites of terrestrial gastropods: *Cochlicella acuta*, *Helicella caperata*, *H. itala* and *H. virgata*. In the laboratory it has been found to attack several other species. The puparium may be formed either within or away from its host shell. Over-winters as the puparium. Adults have been recorded from late May to September. The records suggest two generations per year.

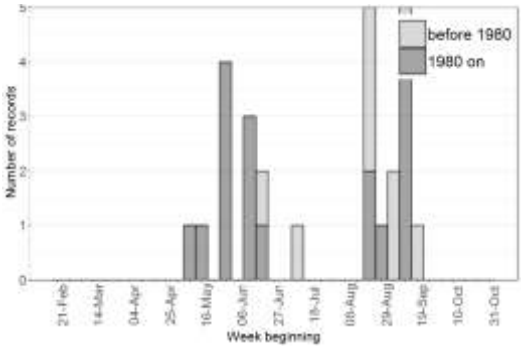
According to Chandler (1972) "*P. knutsoni* may be identical with *Sciomyza virgata* Haliday, 1838. The original description of the latter species is insufficient and the type material lost."



Figs. 98—103. Pherbellia knutsoni. 98 — Andrium in ventral view, 99 — posterior and anterior part of gonostylus, 100 — aedeagus (left: epiphallus), 101 — inner copulatory organ, 102 — pregonite and postgonite, 103 — male postabdomen in lateral view







Pherbellia nana (Fallén, 1820)

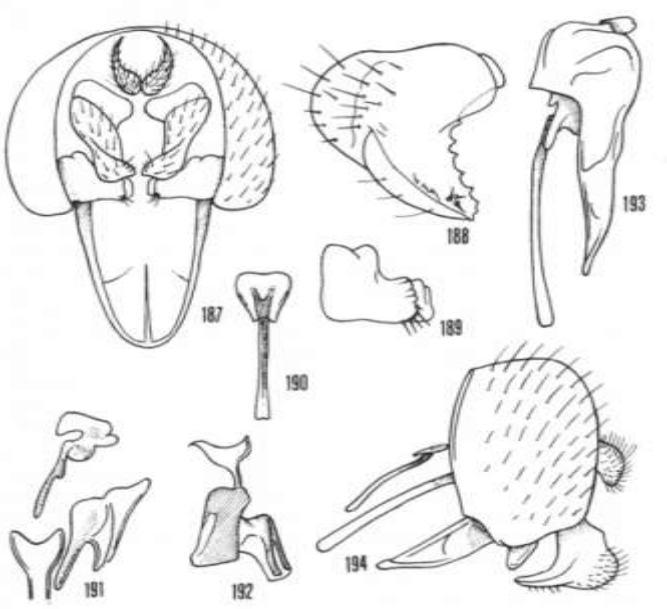
Sciomyza nana Fallén, 1820a: 15.
Pherbellia villiersi Séguy, 1941: 31.

Description: The smallest species of the genus. Ground-colour brown and grey. Short and triangular mid-frontal stripe, orbital plates, occiput and greater part of thorax and abdomen densely greyish pruinose, Rest of frontal band contrasting reddish-brown. Antennal arista short-pubescent. Mesonotum with the usual 4 longitudinal stripes; a distinct brown band at upper margin of pleura. Mesopleuron entirely bare, pteropleuron with several (3-5) subequal hairs. Fore legs darkened except for coxae and last tarsal segment, other pairs of legs paler but with a brown apical ring on middle and hind femora and tibiae. Wings very characteristic - slightly infuscated with some diffuse markings in the form of a subapical transverse stripe and several median spots. Posterior part of gonostyli large, subtriangular and incurved, anterior part relatively small. Inner copulatory organ of the same type as in *P. argyra*, i.e. with a distinct epiphallus having, however, a simple margin, no paraphallus, and with a strengthened distiphallus. Length: body 2.4-3.5 mm, wing 2.2-3.3 mm.

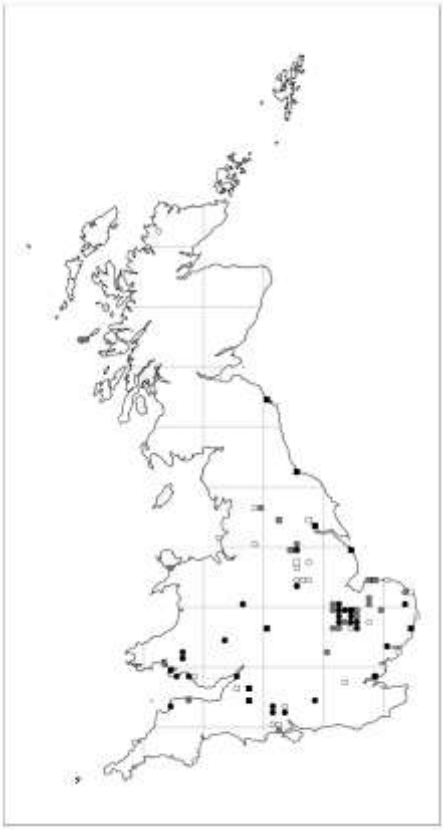
Distribution: Holarctic; in the Palaearctic region from Lapland south to northern France, Ireland eastwards through central Europe to European Russia; Mediterranean basin from North Africa (Morocco, Algeria) to Greece; in Asia across Afghanistan, Mongolia to China to Japan; in North America (where it is the most

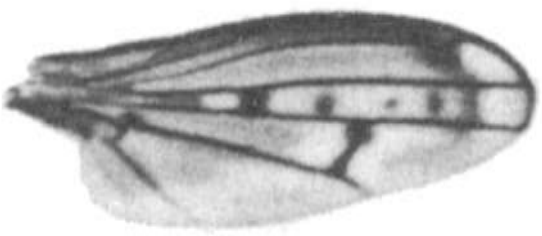
widespread *Pherbellia*) from Alaska to southern Mexico, Florida and eastern Quebec (map: Bratt *et al*., 1969). In Britain, local beside ponds and ditches with summer draw down in water levels. '**Notable**' according to Falk (1991). Recorded from 23 hectads before 1980 and 60 hectads since.

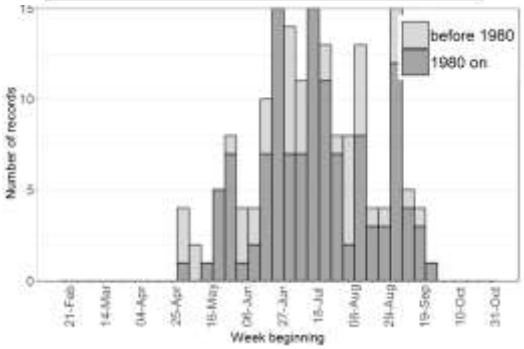
Biology: Adults have been collected in various habitats such as open sunlit marshes, deeply shaded forest pools and margins of lakes. The larvae are probably not host specific and live as parasitoids in many species of aquatic snails (*Aplexa*, *Lymnaea*, *Physa*, *Planorbis*) as well as in terrestrial species (*Eulota*, *Helicella*, *Hygromia*, *Succinea*). The larval stage lasts 6-18 days, the pupal period 7-13 days, and puparium is usually formed within the host shell. Polyvoltine, may breed throughout the year in the southern parts of its range. Over-winters as the puparium. All immature stages were described by Bratt *et al*. (1969). Flight period from mid April to September.



Figs. 187-194. *Pherbellia nana* (Fall.). – 187: andrium in ventral view; 188 & 189: posterior and anterior part of gonostylus; 190: ejaculatory apodeme; 191: pregonite and postgonite; 192: aedeagus; 193: inner copulatory organ (without ejaculatory apodeme); 194: andrium in lateral view.







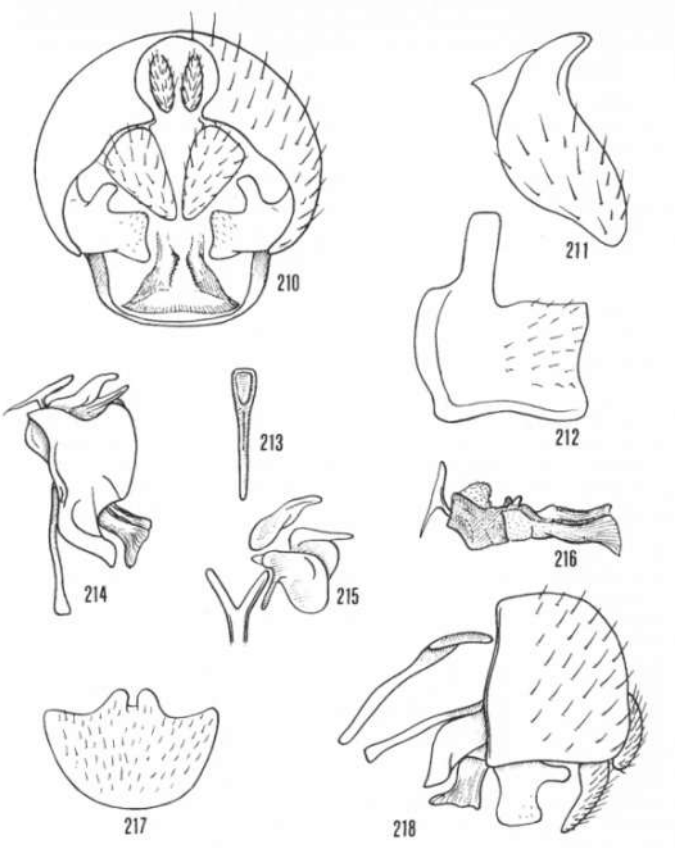
Pherbellia pallidiventris (Fallén, 1820)

Sciomyza pallidiventris Fallén, 1820a: 14.

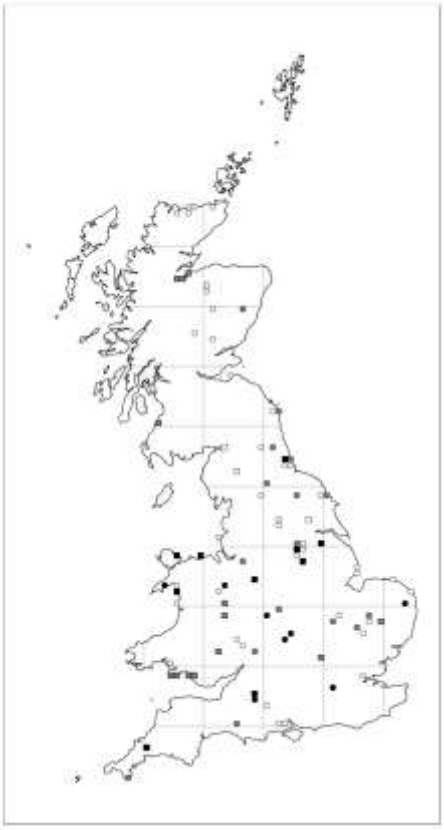
Description: A small species with bare mesopleuron. Ground-colour yellow, but mesonotum grey and lower pleura also more greyish, both whitish pruinose. Short mid-frontal stripe and orbits greyish-brown, densely whitish pollinose, rest of frontal band contrasting yellow. Third antennal segment relatively short and rounded, arista short-pubescent. Fore legs darkened, often almost black in females but pale in males. Pteropleuron with two setae and 1-2 additional bristle-like hairs. Colour of abdomen rather variable, yellowish-brown or more greyish, often paler on distal margins of terga. Anterior part of gonostyli with a typical band-shaped dorsal process. Sternum 5 also very characteristic, semicircular and with a pair of tubercles on posterior margin. Hypandrium and aedeagus unusually broad, epiphallus distinct. Length: body 2.4-4.0 mm, wing 2.5-3.8 mm.

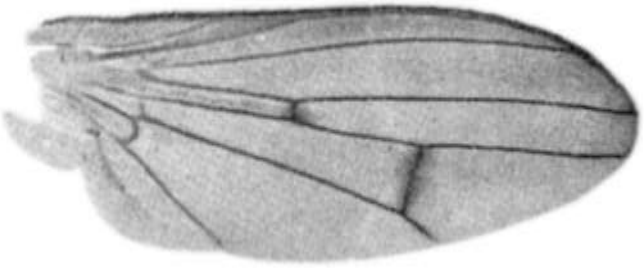
Distribution: A European species occurring from Lapland south to the Pyrenees and from Ireland eastwards through central Europe to European Russia and the Ukraine. Local throughout Britain in woodlands, wetlands and coastal habitats. Recorded from 41 hectads before 1980 and 47 hectads since.

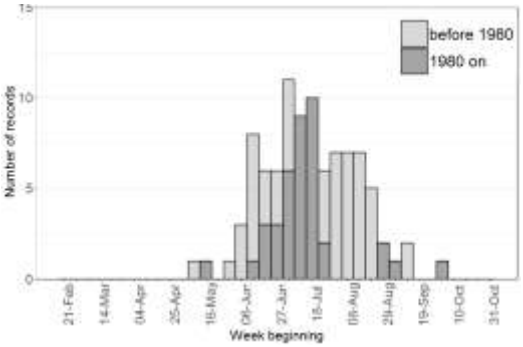
Biology: Adults have been collected in damp woodland and from the sheltered margins of standing water. Immature stages unknown. Occurs from the beginning of June to the end of August.



Figs. 210-218. *Pherbellia pallidiventris* (Fall.). – 210: andrium in ventral view; 211 & 212: posterior and anterior part of gonostylus; 213: ejaculatory apodeme; 214: inner copulatory organ (without ejaculatory apodeme); 215: pregonite and postgonite; 216: aedeagus; 217: the male 5th sternite; 218: andrium in lateral view.







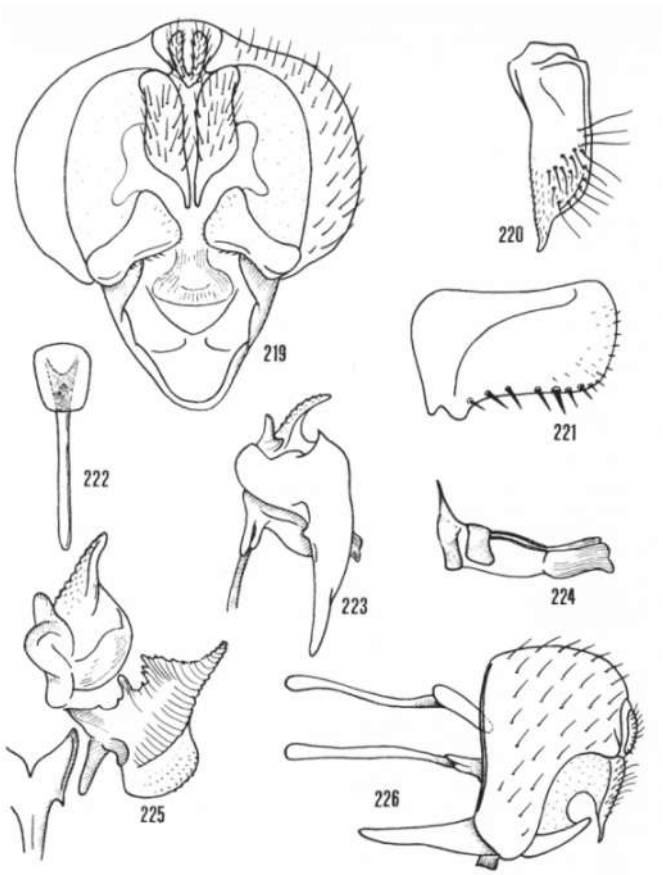
Pherbellia rozkosnyi Verbeke, 1967

Pherbellia rozkosnyi Verbeke, 1967

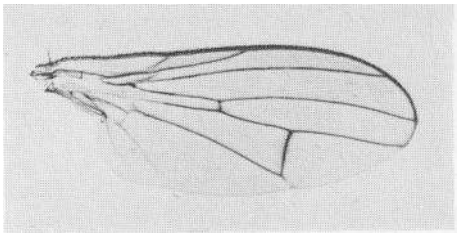
Description: A species of the *ventralis*-group that is closely related to *P. scutellaris*. Head relatively round in lateral view, mid-frontal stripe reaching at most to middle of frons, arista only short-pubescent. Mesonotum usually darker than in *scutellaris*, densely grey pollinose, scutellum contrasting yellow. Mesopleuron bare, pteropleuron with the usual two stronger setae and 4-6 additional hairs. Legs yellow, in males often only the last 3 tarsal segments on fore legs contrasting dark. In females the fore legs much darker, tibiae and tarsal segments almost black. Hind femur with dark brown spots at tip. Male genitalia similar to those of *scutellaris* but remarkably different in following characters: posterior part of gonostyli relatively narrow, not markedly broadened before apex; postgonite also bilobed but the dorsal projection much shorter that the ventral; basiphallus with a distinct pointed dorsal projection. Length; body 4.3-4.8 mm, wing 4.4-4.6 mm.

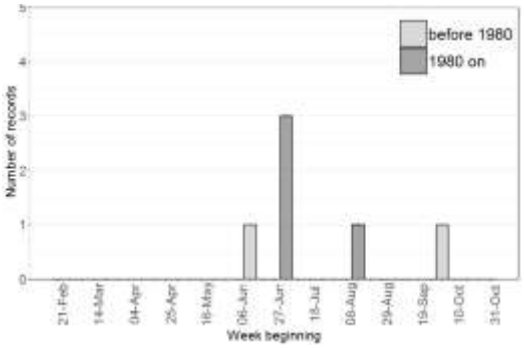
Distribution: This species has been confused with *P. scutellaris*. Very probably a European species, recorded from Finland to Germany, Ireland eastwards through central Europe to the Czech Republic, Slovakia and Switzerland and also northern Italy. Added to the British list by Perry (1990) who swept a male on the north Devon coast on the Dipterists Forum summer field meeting in 1989. Recorded from 0 hectads before 1980 and 7 hectads since.

Biology: Adults found in deciduous woodland, pine forest at higher altitudes, also damp grassland with tall-herb communities. Immature stages unknown. Bratt *et al*. (1969) apparently confused this species with *P. scutellaris*. The flight period seems to be relatively long, from the beginning of June to the middle of October.



Figs. 219-226. *Pherbellia rozkosnyi* Verb. – 219: andrium in ventral view; 220 & 221: posterior and anterior part of gonostylus; 222: ejaculatory apodeme; 223: inner copulatory organ (without ejaculatory apodeme); 224: aedeagus; 225: pregonite and postgonite; 226: andrium in lateral view.





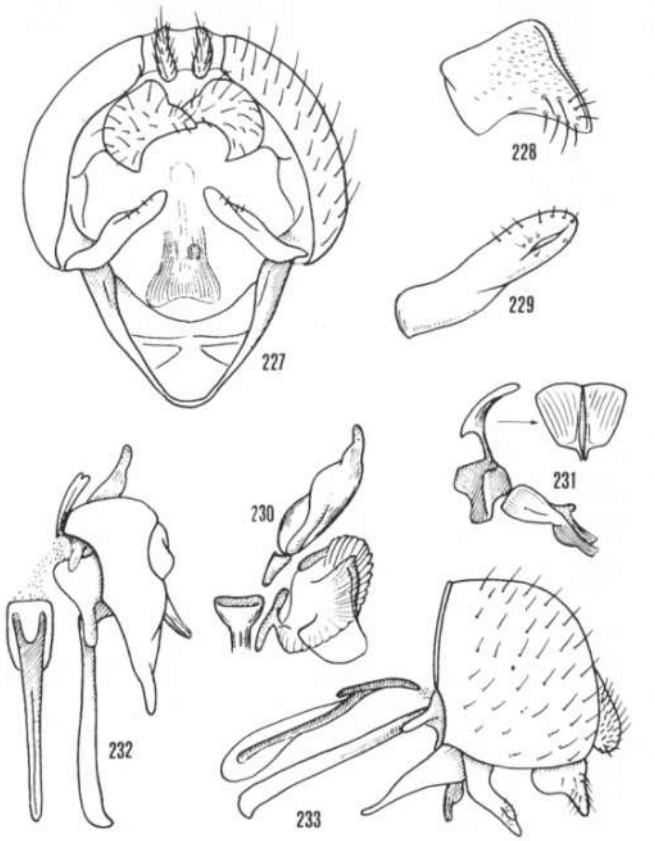
Pherbellia schoenherri (Fallén, 1826)

Musca punctata Fabricius, 1794: 347 (preocc. by *Musca punctata* Poda, 1761).
Sciomyza schoenherri Fallén, 1826: 13.
Pherbellia vernalis Robineau-Desvoidy, 1830: 696.

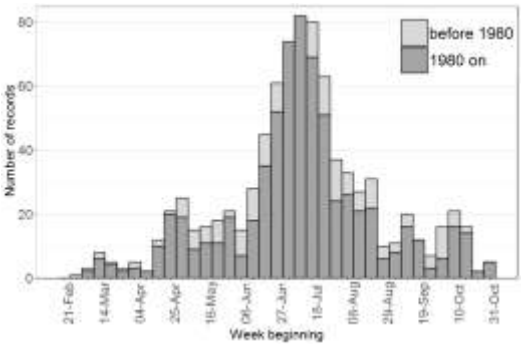
Description: A very distinctive species characterised by blackish spots on the wings. Mid-frontal stripe extending to anterior margin of frons as in *grisescens*, but two orbital setae present and mesopleuron entirely bare. Ground-colour brown, mesonotum, lower pleura and abdomen more greyish. Pteropleuron with 4-6 subequal bristle-like hairs, and several similar elongated hairs distinct in upper posterior corner of sternopleuron. Fore legs intensively darkened. Posterior part of gonostyli sub-triangular, anterior part relatively slender. Ejaculatory apodeme long, with a ridge on greater part of its length. Postgonites elongated, epiphallus large. Length: body 3.2-5.0 mm, wing 3.4-4.6 mm.

Distribution: Holarctic; in the Palaearctic, from Scandinavia south to Spain, Ireland eastwards through northern and central Europe to European Russia; Turkey, Mongolia and Japan. Transcontinental in the Nearctic. Widespread and sometimes abundant, in a wide range of wetlands throughout Britain. Recorded from 38 hectads before 1980 and 260 hectads since.

Biology: Adults are frequent at the margins of ponds, lakes and streams, often in reed or sedge beds or tall-herb communities. Females oviposit on the shells of semi-terrestrial or 'aerial' Succineidae (especially *Succinea* and *Oxyloma* spp.) and the larvae live as very specialised parasitoids. Eggs are laid longitudinally in the sutures and always on living snails. Only one larva is able to complete its development in each snail. The complete larval development takes about 7 days. The larva usually pupates away from the host. Some very early collecting dates indicate that the species can overwinter in the adult stage. The egg and the puparium were described by Rozkošný (1967). McDonnell et al. (2003) found that it would also attack *Galba truncatula* in situations where other Succineidae are scarce. Since this snail is an important vector of liver fluke, this suggests the fly has potential as a biological control agent.



Figs. 227-233. *Pherbellia schoenherri* (Fall.). – 227: andrium in ventral view; 228 & 229: posterior and anterior part of gonostylus; 230: pregonite and postgonite; 231: aedeagus; 232: inner copulatory organ; 233: andrium in lateral view.



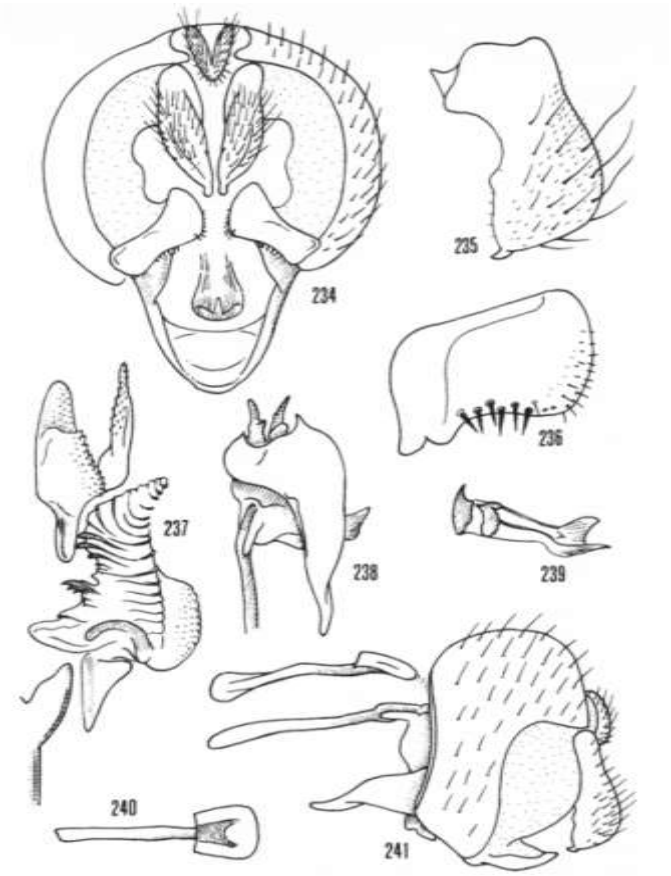
Pherbellia scutellaris (Roser, 1840)

Sciomyza scutellaris Roser, 1840: 61.
Sciomyza bezzii Hendel, 1902a: 46.

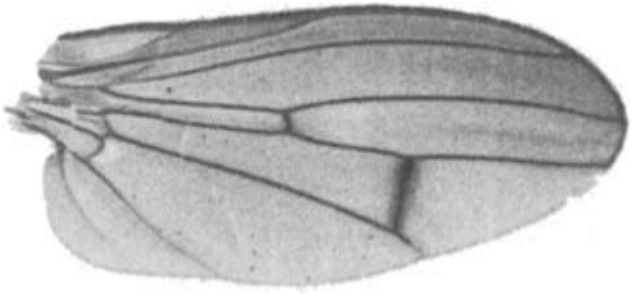
Description: Closely related to *P. rozkosnyi*; reliable differences are found mainly in the male genitalia. Ground-colour unusually variable, from mainly yellow to greyish-brown. Mid-frontal stripe reaching at most to middle of frons, antennal arista short-pubescent. Mesonotum mostly more brown than grey, with 4 indistinct longitudinal stripes, scutellum yellow but not too contrasting. Pleura often at least partly yellowish, mesopleuron bare, pteropleuron with the usual two setae in addition to several hairs. Fore legs darkened but femora mainly yellow, only their inner side more brownish on apical third. Also fore basitarsi mainly pale yellow. Two dark spots distinct at tip of hind femur. Ventral side of hind trochanters and femora with very dense pubescence in males. Posterior part of gonostyli very broad even in apical half, with a short spine-like tip on inner side. Postgonite duplicated, both its projections of the same length. Basiphallus only with a very short dorsal projection. Length: body 4.2-6.0 mm, wing 4.4-5.6 mm.

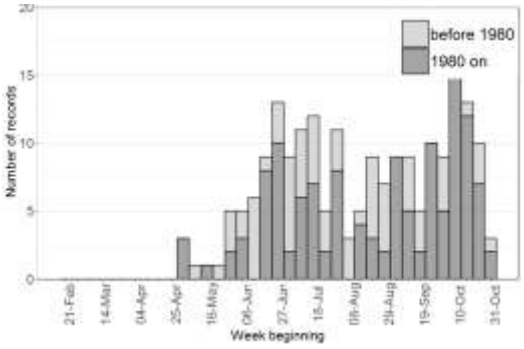
Distribution: Requires review due to confusion with closely related species (*P. pallidicarpa*, *P. rozkosnyi*, *P. sordida*), but probably widespread in Atlantic and Continental Europe. Confirmed records from Britain, Ireland, Belgium, France, Switzerland, Norway, European Russia and Mongolia. In shaded woodlands (often ancient) throughout Britain. Recorded from 45 hectads before 1980 and 110 hectads since.

Biology: The species is locally abundant in deciduous and sometimes also in coniferous woods, especially in open, grassy areas with flushes. Larvae have been found in the wild feeding in two *Clausilia* spp. (which are small terrestrial pulmonate snails), but they killed and fed on a wide range of terrestrial gastropods during laboratory rearing. The larval stage lasts from 54 to 94 days. The pupal period took 44 days. The puparia are formed outside the host shell. Probably over-winters in the larval stage. Biology and all immature stages were described by Bratt *et al*. (1969), but this account may refer at least partly to *P. rozkosnyi*. Adults occur from May to late September or October. The records suggest two generations per year.



Figs. 234-241. *Pherbellia scutellaris* (Roser). – 234: andrium in ventral view; 235 & 236: posterior and anterior part of gonostylus; 237: pregonite and postgonite; 238: inner copulatory organ (without ejaculatory apodeme); 239: aedeagus; 240: ejaculatory apodeme; 241: andrium in lateral view.





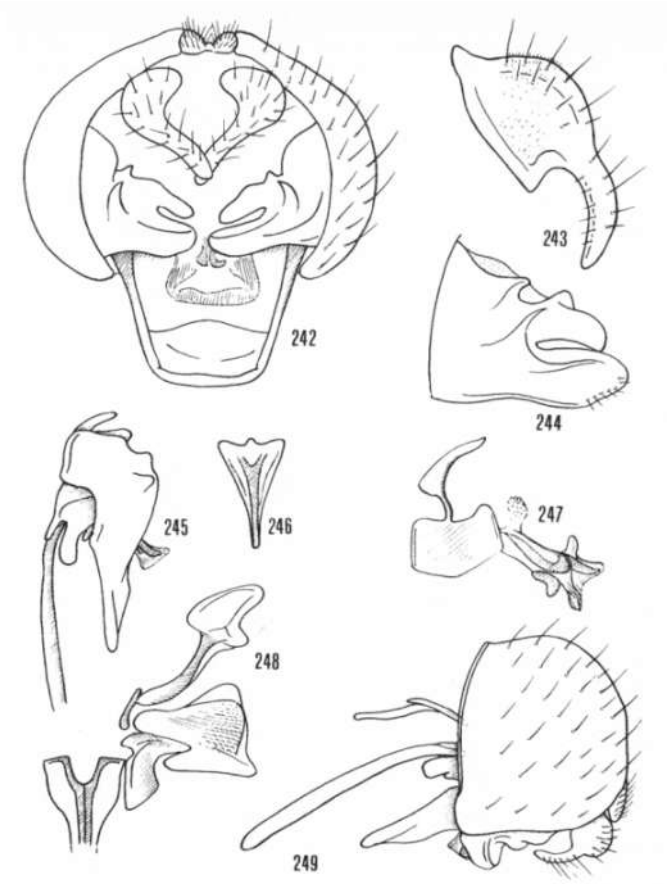
Pherbellia sordida (Hendel, 1902)

Sciomyza sordida Hendel, 1902a: 43.

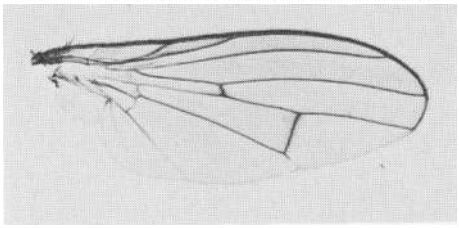
Description: Externally resembling *P. scutellaris*, but closely related to *P. griseicollis* according to male genitalia. Mid-frontal stripe rather short, cheek much narrower than half height of eye. Arista with relatively long pubescence, dorsal hairs distinctly longer than arista is broad at base. Mesonotum mainly grey, humeri and notopleura paler, often almost yellow, pleura extensively greyish pollinose. Fore legs mainly uniform in colour, yellowish-brown in males and brown in females, only last tarsal segments more darkened. Hind femora without apical spots, ventral pubescence on hind trochanters and femora not as dense as in *P. scutellaris*. Posterior part of gonostyli hook-like in lateral view, anterior part with apical incision. Ejaculatory apodeme short and broad, postgonite broadened apically. Aedeagus of the same type as *P. griseicollis*, i.e. with a well-developed epiphallus, paraphallus and elongated stripe-like plates in distiphallus. Length: body 5.0-5.7 mm, wing 5.2-5.6 mm.

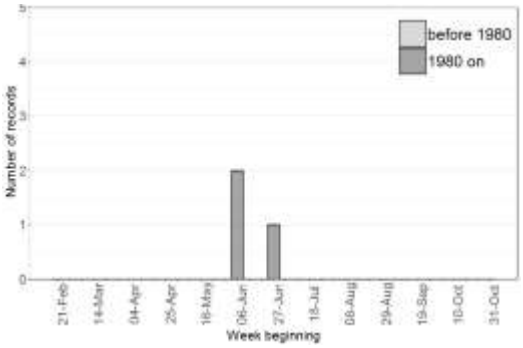
Distribution: Probably a European species: from Scandinavia to the Pyrenees and from Britain eastwards to Italy, Hungary, Romania and the European parts of Russia. Added to the British list by Perry (1990) from a male swept from rough grass and nettles beneath pines in the Kings Forest, Suffolk on 24 June. Mike Pavett found a second specimen at Pant-y-Sais on 4 June 2002.

Biology: Adults may live near standing water and marshes, but they have sometimes been collected in drier situations. Immature stages unknown. Speight & Knutson (2012) give the flight period as end of April to beginning of September.



Figs. 242-249. *Pherbellia sordida* (Hend.). – 242: andrium in ventral view; 243 & 244: posterior and anterior part of gonostylus; 245: inner copulatory organ (without ejaculatory apodeme); 246: ejaculatory apodeme; 247: aedeagus; 248: pregonite and postgonite; 249: andrium in lateral view.





Pherbellia stackelbergi Elberg, 1965

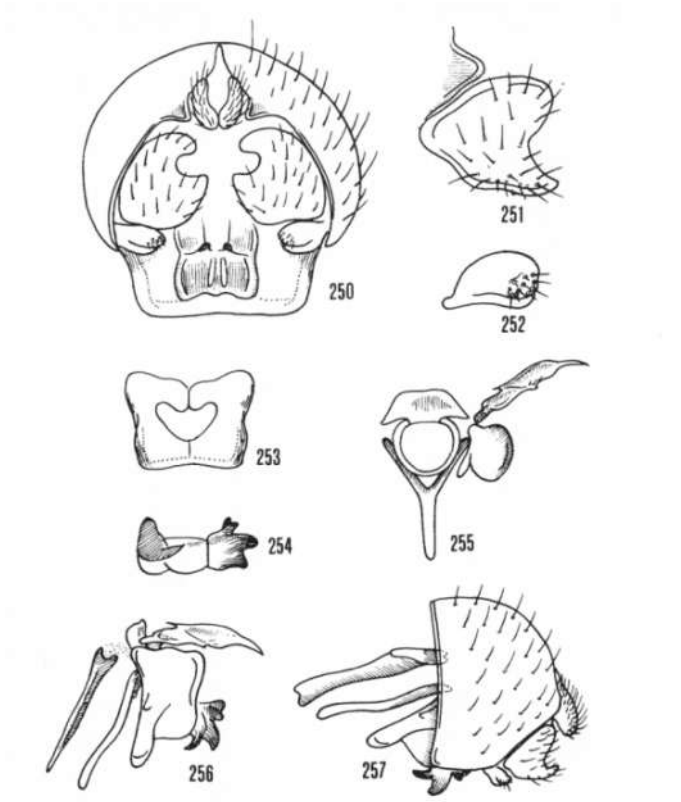
Pherbellia stackelbergi Elberg, 1965: 191.

Description: Closely related to *P. brunnipes* as is indicated by the external characters as well as by the structure of male genitalia. Mid-frontal stripe elongate and pointed, usually reaching anterior margin of

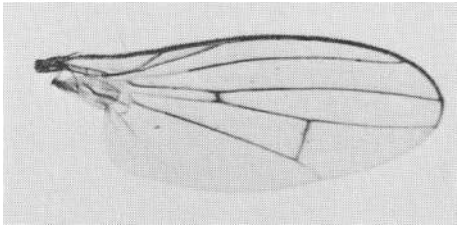
frons. Arista short-pubescent. A row of several hairs well-developed on space between anterior orbital seta and fore margin of frons. Ground-colour as in *brunnipes* including greyish mesonotum and transversely brown and yellow striped abdomen. Mesopleuron completely bare, pteropleuron with several subequal hairs, and sternopleuron with 2 distinct setae at upper margin. Male genitalia very similar to those of *brunnipes* but with the following differences: posterior part of gonostyli distinctly pointed on inner side, postgonites also elongated but more narrowed apically; some smaller differences are also to be found in the shape of ejaculatory apodeme, hypandrium and aedeagus. Length: body 3.0-3.5 mm, wing 2.2-3.5 mm.

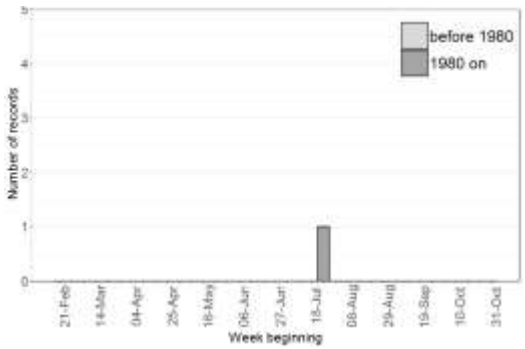
Distribution: A Eurasian species, known to occur in Sweden, Finland, Denmark, Germany, Poland, the Leningrad area, the Estonian SSR and in Siberia (Samarovo on the lrtysh river). Added to the British list by Staunton *et al*. (2008) from a single female caught in an emergence trap on the banks of the River Shanon in Co. Roscommon, Ireland in July 2007 and, so far, only recorded from Ireland.

Biology: Unknown. The long flight period elsewhere extends from the beginning of May to late October.



Figs. 250-257. *Pherbellia stackelbergi* Elb. – 250: andrium in ventral view; 251 & 252: posterior and anterior part of gonostylus; 253: hypandrium in ventral view; 254: aedeagus; 255: aedeagal apodeme, epiphallus, pregonite and postgonite; 256: inner copulatory organ; 257: andrium in lateral view.





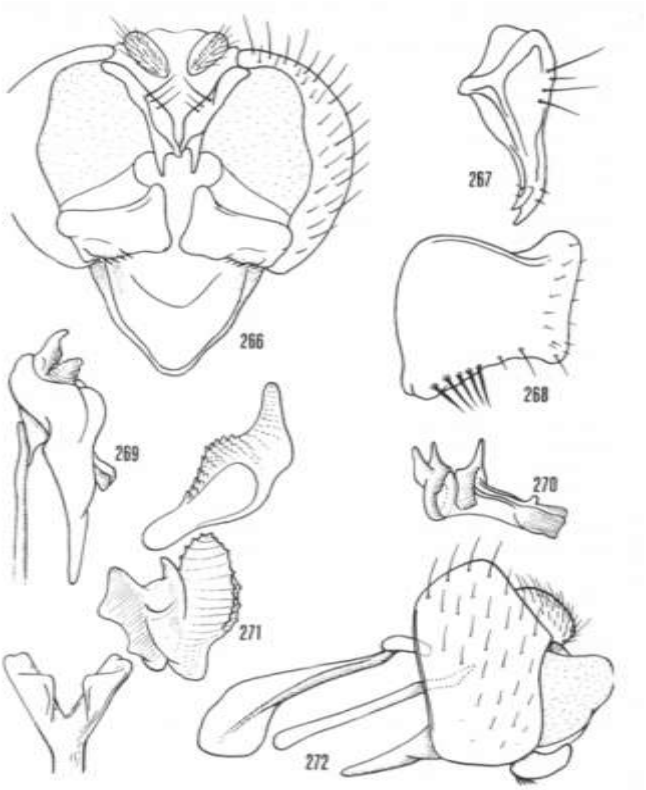
Pherbellia ventralis (Fallén, 1820)

Sciomyza ventralis Fallén, 1820a: 14.

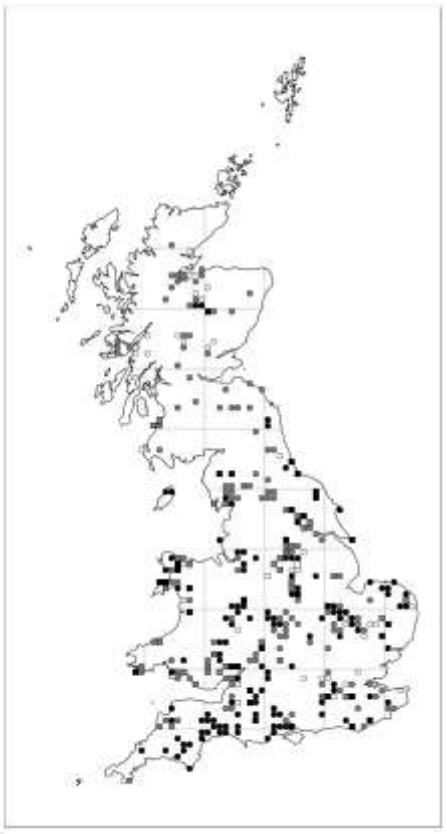
Description: A typical species of the *ventralis*-group, and most closely related to *P. obscura*. Mid-frontal stripe short; occiput, orbital plates and entire thorax contrasting grey, in some males even bluish-grey; abdomen usually unicolorous, yellow to yellowish-brown. Antennal arista very short-pubescent, inner angle of eye distinctly obtuse in frontal view. Mesopleuron bare, pteropleuron with 4-6 subequal hairs, sternopleuron haired but without setae. Fore legs darkened, usually grey pollinose. Posterior part of gonostyli gradually narrowed, bifid apically, with several stronger setae; anterior part broad, with the usual row of strong setae at base. Pregonite transversely ridged, postgonite with rows of warts, both relatively large and simple. Basiphallus bipartite, with several pointed dorsal projections. Length: body 3.0-4.4 mm, wing 3.2-4.2 mm.

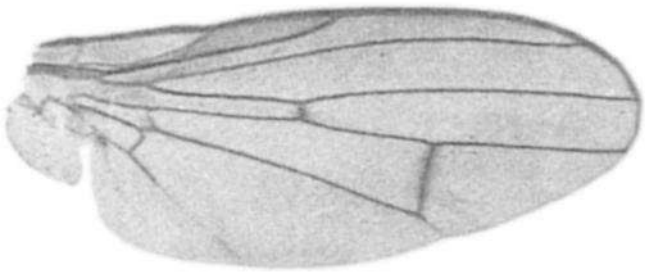
Distribution: A European species, extending from Iceland south to northern France and Ireland eastwards through northern and central Europe to Italy and parts of European Russia (map: Bratt *et al*., 1969). Common in a wide range of wetlands throughout Britain. Recorded from 40 hectads before 1980 and 310 hectads since.

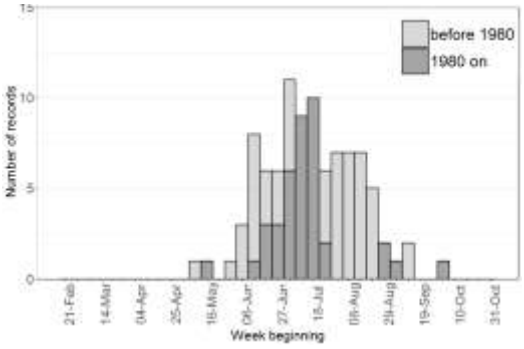
Biology: Adults in various aquatic and damp habitats from calcareous flushes to stream-sides in blanket bog and damp, unimproved grasslands. A larva found in the field was feeding on a living *Stagnicola palustris*, but in the laboratory the larvae attacked other aquatic snails including physids, planorbids and *Succinea* spp. The larval stage lasted 8-12 days, and the pupal period 10-21 days. Larvae pupated on moss or in the host shells. A polyvoltine species that apparently over-winters in the pupal stage. The flight period appears to be rather long, from the beginning of April to late October, but the species is most common in spring and early summer. All immature stages were described by Bratt *et al*. (1969).



Figs. 266-272. *Pherbellia ventralis* (Fall.). – 266: andrium in ventral view; 267 & 268: posterior and anterior part of gonostylus; 269: inner copulatory organ (without ejaculatory apodeme); 270: aedeagus; 271: pregonite and postgonite; 272: andrium in lateral view.







Genus *Pteromicra* Lioy, 1864

Pteromicra Lioy, 1864: 1012.
Type-species *Sciomyza glabricula* Fallén, 1820a (mon.).
Dichrochira Hendel, 1902a: 57.
Type-species: *Sciomyza nigrimana* Meigen, 1830 (= *Sciomyza glabricula* Fallén, 1820a) (subseq. des. by Cresson, 1920: 38).

Generally small species with dark brown to black and yellow ground-colour. In terms of the ground-plan of the family, most characters are distinctly plesiotypic, but the anterior orbital seta is often short or missing and the cheeks are unusually narrow. Mid-frontal stripe virtually absent and frons entirely shining, arista moderately long-haired. Propleural seta rather weak but distinct, prosternum always bare like the mesopleuron. Pteropleuron with several hairs, sternopleuron haired on greater part of its surface. Fore tibia only with one preapical seta, inner posterior margin of hind coxae bare. Wings distinctly narrowed in *P. angustipennis* and *P. oldenbergi*, with a partly reduced anal lobe; hyaline or completely infuscated, without darker pattern. Vein R_1 ending beyond anterior cross-vein, anal vein complete, reaching wing-margin. Male genitalia of the same basic type as in *Pherbellia*, both parts of gonostyli always well-developed. Hypandrium with a pair of pubescent lobes in ventral and posterior position that may even

represent apical parts of the postgonites. These lobes appear to be quite specific structures confined to the species of *Pteromicra*. Ejaculatory apodeme moderately to rather long, without any vertical ridge. Pregonites and postgonites well separated, a rather short and broad epiphallus always present. True paraphallus missing, and a curved dorsal projection on basiphallus only found in *P. glabricula* (Fall). Distiphallus fairly flat and apically dilated.

The biology of the genus and the morphology of the immature stages were studied by Rozkošný & Knutson (1970), who also revised the type-material and distribution of the Palaearctic species. The larvae were first thought to be predators of aquatic and hydrophilous snails, but in view of the many parasitoid tendencies detected in the species studied, they have recently been classified as parasitoids.

The world fauna of the genus is relatively well-known, and a list of the species compiled by Rozkošný (1979) includes 17 species, 6 of which are found in the Palaearctic region and 4 in the British Isles.

Pteromicra angustipennis (Staeger, 1845)

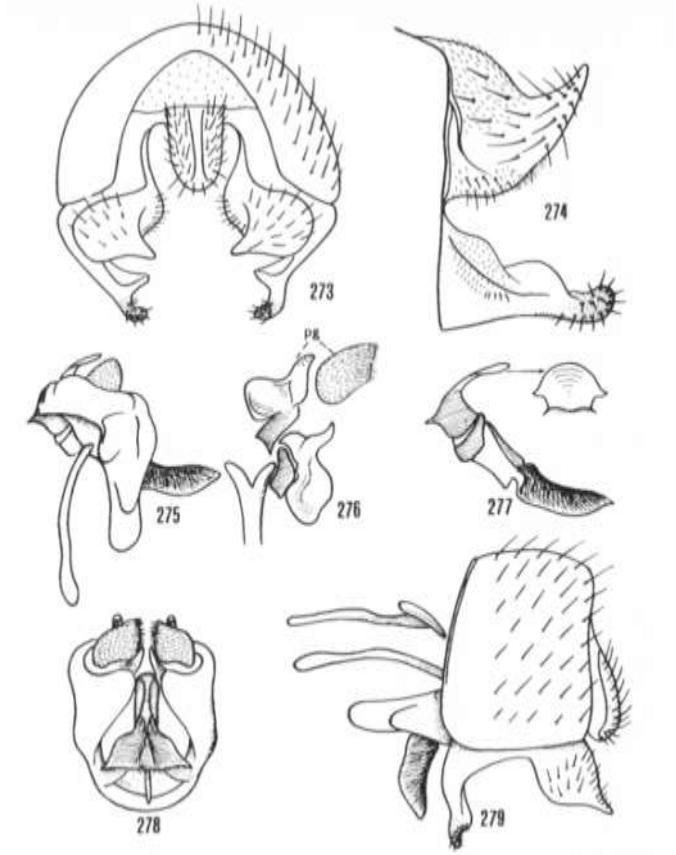
Sciomyza angustipennis Staeger. 1845: 40.
Sciomyza glabricula auct. nec Fallén, 1820a: 15.

Description: Anterior half of frons extensively yellow, two orbital setae present, the anterior one somewhat shorter. Third antennal segment darkened, arista moderately long-haired, dorsal hairs about half as long as width of third antennal segment. Central part of face brownish. Thorax mainly dark brown and black, hypopleuron brown, whitish pollinose. Fore legs mainly black, only coxae whitish and basal third (or more) of femora yellow. In males last tarsal segment often yellowish. Wings brownish infuscated, distinctly narrowed, with a partly reduced anal lobe. Posterior part of gonostyli subtriangular, pointed on inner side, anterior part bifid in caudal view. Ejaculatory apodeme long, epiphallus almost semicircular. Length: body 2.5-4.0 mm, wing 2.0-3.4 mm.

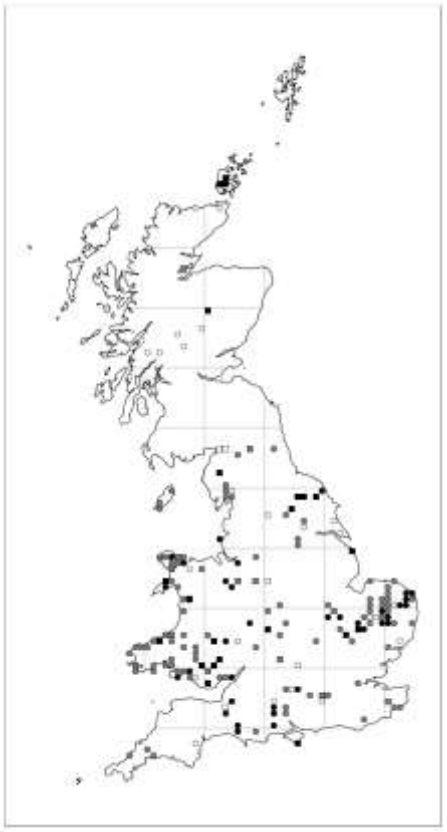
Distribution: Holarctic: in the Palaearctic region from Lapland south to northern France, Ireland eastwards through northern and central Europe, parts of Russia, and Siberia to the Pacific; also Mongolia. In North America known to occur in Alaska, British Columbia, Alberta, and Manitoba (map: Rozkošný & Knutson, 1970). The commonest member of the genus, widespread throughout Britain, most easily found in tussocks in wetlands and beside freshwater. This was the most abundant species in pitfall traps operated by the Welsh Peatlands Invertebrate Survey although it was rarely recorded by other sampling techniques (water traps and sweep netting). It seems likely that it is reluctant to fly and remains low down in the vegetation where it is not readily detected by a Dipterist with a hand net. Recorded from 31 hectads before 1980 and 158 hectads since.

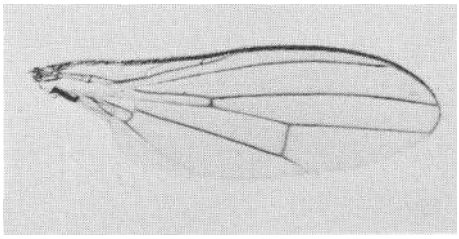
Biology: Adults have been collected around ponds, swamps and marshes, damp, unimproved seasonally flooded grassland and drainage ditches with slow-moving water. In the laboratory the larvae are predatory on various freshwater and terrestrial gastropods: *Anisus vortex*, *Bathyomphalus contortus*, *Galba truncatula*, young *Planorbis planorbis*, *Segmentina nitida*, *Succinea* spp. and *Trochulus hispidus*. Snails attacked by the larva may live for 2 days but then die; thereafter the larva buries itself in the snail's tissue with only its posterior spiracles protruding, until the host is consumed. The puparium may be formed in the

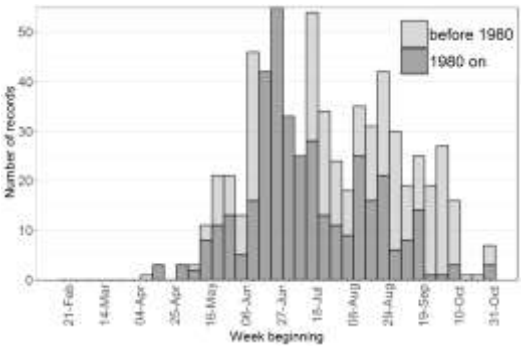
host's shell, but more usually within damp substrates nearby. Believed to overwinter in the puparium. The flight period is from May to the beginning of September.



Figs. 273-279. *Pteromicra angustipennis* (Stæg.). – 273: andrium in caudal view; 274: posterior and anterior part of gonostylus; 275: inner copulatory organ (without ejaculatory apodeme) in lateral view; 276: pregonite and postgonite; 277: aedeagus; 278: inner copulatory organ in ventral view; 279: andrium in lateral view.







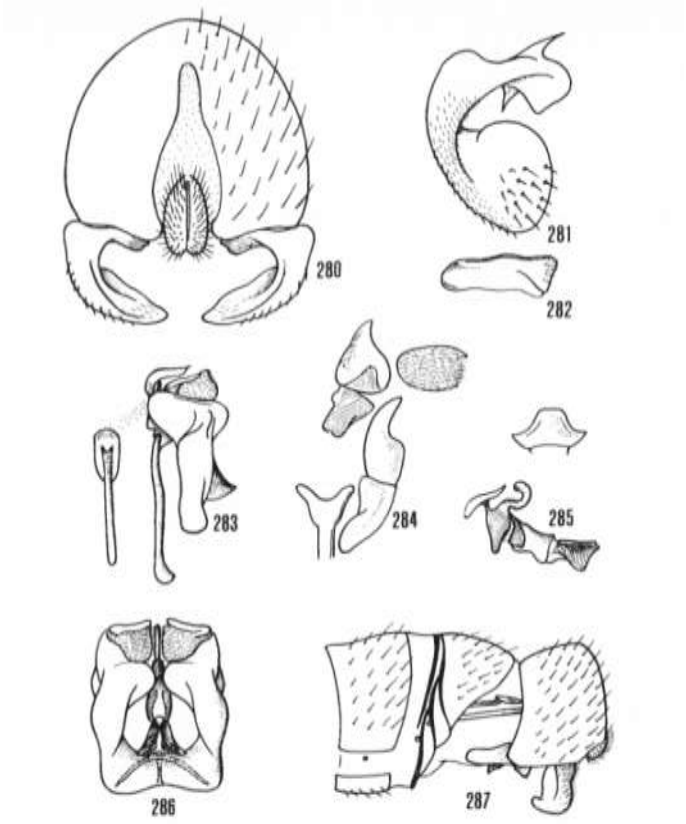
Pteromicra glabricula (Fallén, 1820)

Sciomyza glabricula Fallén, 1820a: l5.
Sciomyza nigrimana Meigen, 1830: 14.
Sciomyza albitarsis Zetterstedt, 1838: 738.

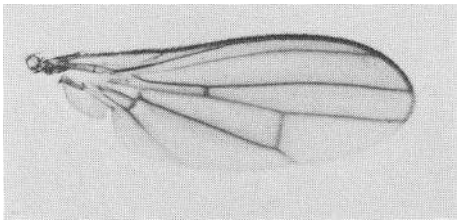
Description: Only narrow anterior margin of frons yellow and only one orbital seta present. Third antennal segment partly blackish, arista short-haired, dorsal hairs often hardly half as long as width of third antennal segment. Face mainly shining black, thorax also entirely dark brown and black. Fore legs darkened, but basal two-thirds of femora yellow and apical tarsal segment whitish. Wings only slightly infuscated and not narrowed. Posterior part of gonostyli large, blade-like, anterior part comparatively small. Ejaculatory apodeme rather long, epiphallus subtriangular. Basiphallus with a recurved dorsal projection. Length: body 2.5-4.0 mm, wing 2.8-3.6 mm.

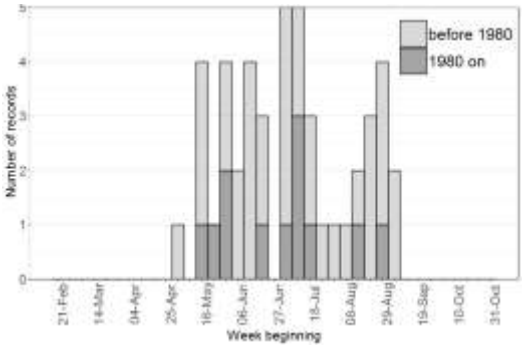
Distribution: Eurasian: Iceland south to northern France, Ireland eastwards through northern and central Europe to Hungary and the European parts of Russia and on through Siberia to the Pacific (map: Rozkošný & Knutson, 1970). Scarce in Britain, beside ponds and in various wetlands. Recorded from 26 hectads before 1980 and 22 hectads since. Was categorised as 'Vulnerable' (RDB2) by Shirt (1987), but reassessed as '**Notable**' by Falk (1991). This species was confused with *P. angustipennis* before the review by Rozkošný & Knutson (1970), so earlier records must be considered unreliable.

Biology: The species occurs around small pools in sparsely wooded marshes, bogs, ponds, and other standing water with seasonally fluctuating water levels. In the laboratory, larvae attacked a wide range of freshwater gastropods such as *Lymnaea*, *Planorbis*, *Physa*, and *Succinea* and the terrestrial genus *Discus*, but the *Lymnaea* spp. were distinctly preferred. Each larva may kill and eat 2-4 snails during its development; the duration of the larval stage is 8-9 days, and pupal period 16-17 days. The puparium is only rarely formed in the host's shell; usually it is formed under some nearby damp substrate. Believed to over-winter in the puparium. All the larval instars and the puparium were described by Rozkošný & Knutson (1970). The flight period extends from May to August.



Figs. 280-287. *Pteromicra glabricula* (Fall.). – 280: andrium in caudal view; 281 & 282: posterior and anterior part of gonostylus; 283: inner copulatory organ in lateral view; 284: pregonite and postgonite; 285: aedeagus (above epiphallus); 286: inner copulatory organ in ventral view; 287: male postabdomen in lateral view.





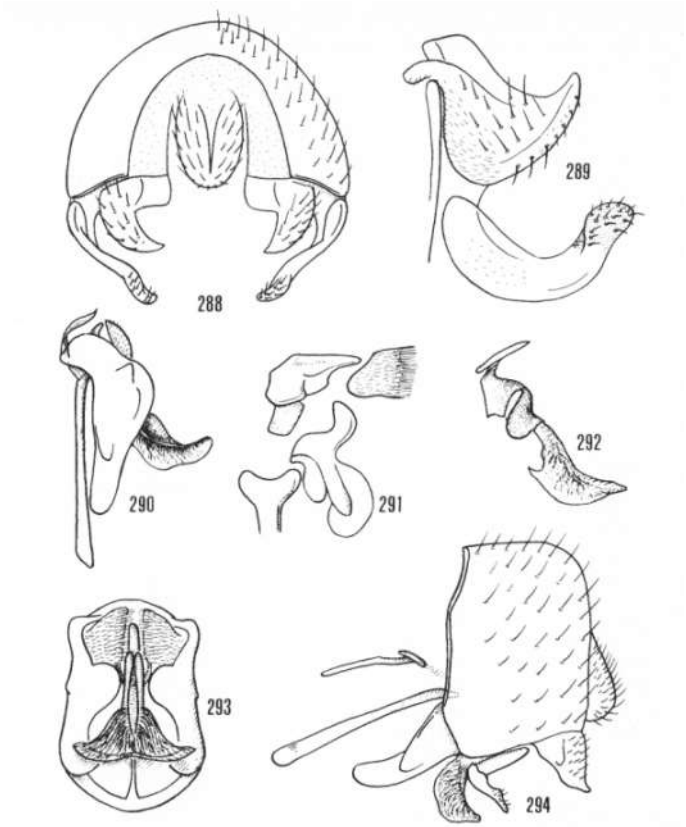
Pteromicra leucopeza (Meigen, 1838)

Opomyza leucopeza Meigen, 1838: 380.

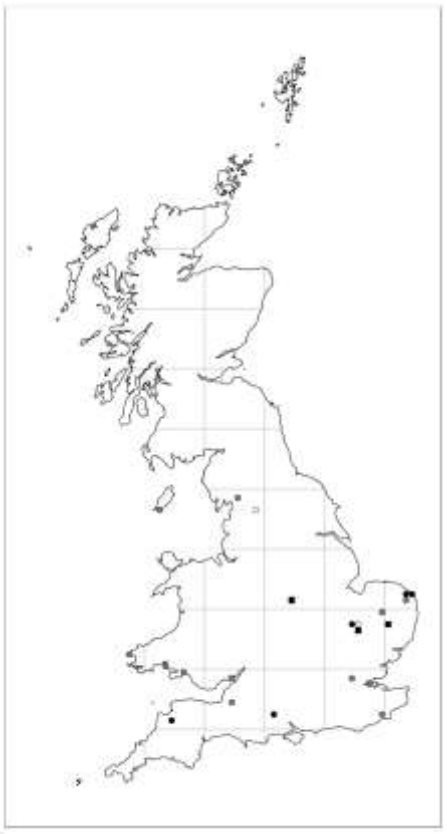
Description: Closely related to *P. angustipennis* according to the structure of the male genitalia, but clearly distinguishable by colour characters and the normal, broad, wings. Anterior half of frons yellowish to a varying extent. Two orbital setae present but anterior one about half as long as posterior seta. Third antennal segment darkened, only yellow ventrobasally. Arista moderately long-haired, its dorsal hairs slightly longer than half width of third antennal segment. Face often brownish, palpi entirely yellow. Thorax shining dark brown to black on mesonotum, scutellum and upper pleura, but extensively yellow on lower pleura and sometimes also on humeri and notopleura. Hypopleuron always yellow, with indistinct whitish pollen. Fore legs mainly black, but coxae whitish and basal half (in males) or narrow base (in females) of femora yellow. Last tarsal segment of fore legs (in males) or 3 apical tarsal segments (in females) contrasting white. Wings only slightly infuscated, the anal lobe not reduced. Posterior part of gonostyli subtriangular but less pointed than in *angustipennis*, anterior part with a simply rounded apex. Some further sound differences may be found in the shape of the hypandrium, pregonites, postgonites, and aedeagus. Ejaculatory apodeme relatively short. Length: body 2.5-4.0 mm, wing 2.8-3.6 mm.

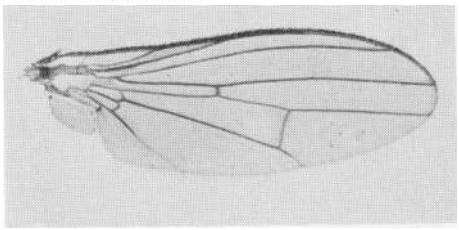
Distribution: Holarctic: in the Palaearctic region from southern Scandinavia south to northern France, Ireland eastwards through northern and central Europe (including the Alps) to parts of European Russia; in North America known from Massachusetts to South Dakota (map; Rozkošný & Knutson, 1970). Beside ponds and ditches mainly in the South. Recorded from 2 hectads before 1980 and 20 hectads since. '**Vulnerable**' (RDB2) according to Falk (1991).

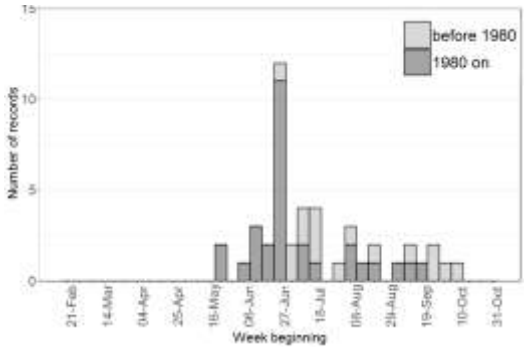
Biology: Adults usually occur around thinly vegetated margins of pools in grassland or in damp woodland. Several larvae were found in dead and living *Bathyomphalus contortus* in Denmark, but they also fed on mature *Anisus vortex* in the laboratory. These larvae continued to feed in decaying snails for 5-6 days and pupated outside the host shells some 6-10 days after they were collected. The pupal stage lasted about 14 days and the puparium is formed in a damp substrate near the consumed host's shell, but collections of viable puparia during the spring indicate that the species overwinters in the puparial stage. The puparium was described by Rozkošný (1967) and Rozkošný & Knutson (1970). The flight period extends from May to the end of September.



Figs. 288-294. *Pteromicra leucopeza* (Meig.). – 288: andrium in caudal view; 289: posterior and anterior part of gonostylus; 290: inner copulatory organ (without ejaculatory apodeme) in lateral view; 291: pregonite and postgonite; 292: aedeagus; 293: inner copulatory organ in ventral view; 294: andrium in lateral view.







Pteromicra pectorosa (Hendel, 1902)

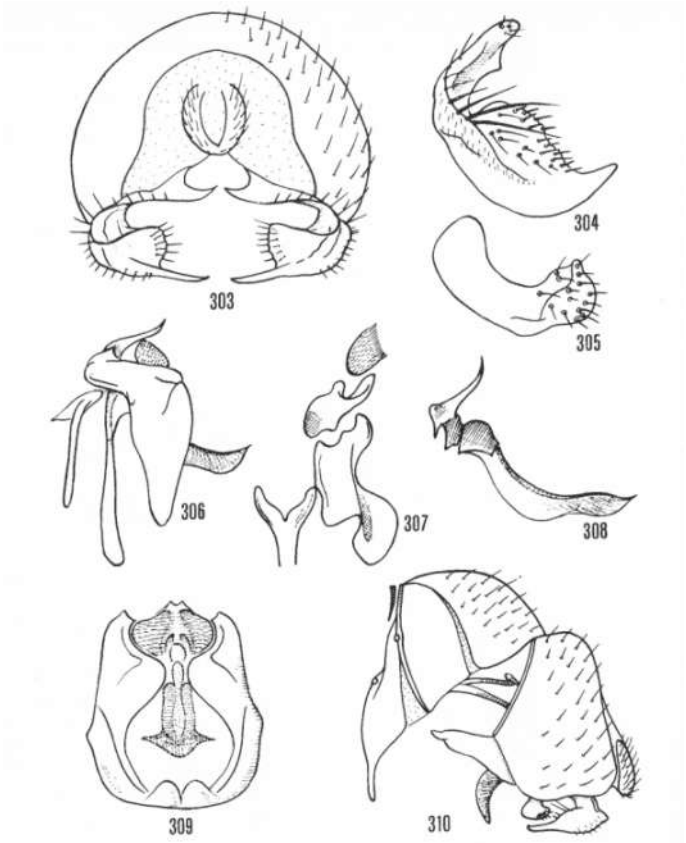
Dichrochira pectorosa Hendel, 1902a: 61.

Description: A rather isolated species, partly resembling *P. leucopeza* in its colour but with only one pair of orbital setae. Anterior margin of frons yellowish to a varying extent, face and palpi completely yellow. Third antennal segment broadly yellow at base and on ventral side, dorsal aristal hairs over half width of third antennal segment. Thorax shining dark brown, but humeri, propleura and at least hypopleuron yellow. Fore legs blackish, coxae white, basal half or less of fore femora yellow. Last 2-3 tarsal segments on fore legs white. Wings somewhat infuscated. Posterior part of gonostyli relatively slender and incurved, anterior part simply rounded. Ejaculatory apodeme moderately long, pregonites and postgonites specific. Epiphallus markedly pointed in lateral view, basiphallus without any dorsal projection. Length: body 3.0-3.8 mm, wing 3.0-3.6 mm.

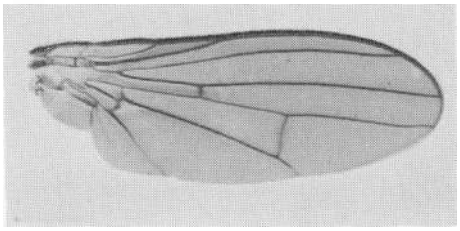
Distribution: Holarctic. In Europe distributed from southern Sweden south to Germany, Ireland eastwards through northern and central Europe (Poland, Czech Republic) to Hungary (map: Rozkošný & Knutson, 1970); in North America extending from Alaska to California, and eastwards to New York. Scarce in

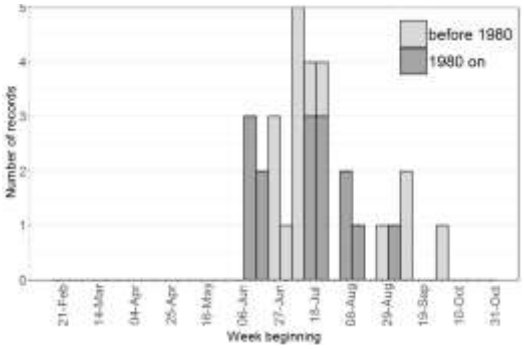
southern Britain, beside ponds and in various wetlands, often near the coast. Recorded from 0 hectads before 1980 and 12 hectads since. '**Vulnerable**' (RDB2) according to Falk (1991).

Biology: Adults have been collected around vernal pools and in swampy areas. Some reared females from Denmark laid up to 714 eggs each during a maximum of 38 days. The newly-hatched larvae killed and ate snails of *Segmentina nitida* and *Anisus vortex* in the laboratory, killing 2-3 snails in the course of their development. The duration of the larval stage ranged from 7 to 10 days. Puparia were formed in or outside the host snail and the pupal period lasted 10 to 13 days. The species probably overwinters in the puparium. All immature stages were described by Rozkošný & Knutson (1970). Flight period seems limited from June to the mid September.



Figs. 303-310. *Pteromicra pectorosa* (Hend.). – 303: andrium in caudal view; 304 & 305: posterior and anterior part of gonostylus; 306: inner copulatory organ in lateral view; 307: pregonite and postgonite; 308: aedeagus; 309: inner copulatory organ in ventral view; 310: male postabdomen in lateral view.





Genus *Sciomyza* Fallén, 1820

Sciomyza Fallén, 1820a: 11.
Type-species: *Sciomyza simplex* Fallén, 18203 (subseq. des. by Westwood, 1840: 145).
Bischofia Hendel, 1902a: 52.
Type-species: *Sciomyza simplex* Fallén, 1820a (subseq. des. by Coquillett, 1910: 514).

Medium-sized to relatively large species characterised by two preapical setae on tibiae. Frons at least partly but often completely shining, ocellar triangle and orbital plates also wholly shining. Two orbital setae always present, antennal arista long-haired. Cheeks always much broader than third antennal segment at base. Prosternum haired in all species, propleural seta long. Mesopleuron with several hairs or rather strong setae along posterior margin, pteropleuron with some hairs and at least two setae, sternopleuron haired. All tibiae with two preapical setae, in a dorsal and anterodorsal position. Posterior inner margin of hind coxae bare. Wings without specific characters. Male genitalia distinctly specialised: both parts of gonostyli connected along margin of periandrium; cerci forming a more or less distinct apical plate that is bifid or pointed distally; hypandrium large and massive in lateral view; postgonites unusually long, with a row of several hairs at tip; aedeagus simple, with a short and broad epiphallus.

The biology of the Holarctic and Nearctic species of the genus was studied by Foote (1959). All the known larvae are apparently associated with terrestrial snails of the family Succineidae. The larvae are considered to be mainly parasitoids, though some predaceous features were also noted.

A key to the world species of *Sciomyza* was given by Steyskal (1954). Only 6 species are now recognised as belonging to this genus, three of which occur in Britain.

Sciomyza dryomyzina Zetterstedt, 1846

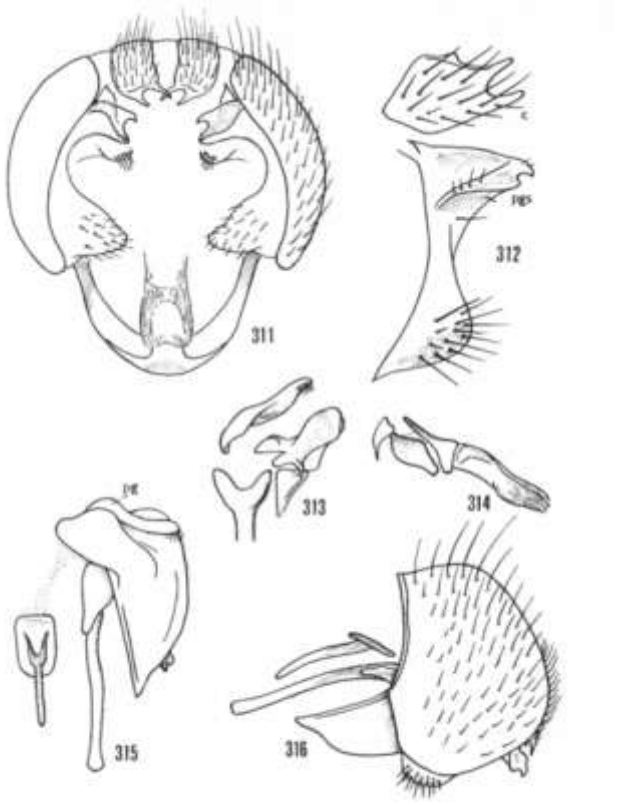
Sciomyza dryomyzina Zetterstedt, 1846: 2094.
Sciomyza atrimana Zetterstedt, 1860: 6335.

Description: Body mainly reddish-yellow, including third antennal segment and mesonotum, but fore femora and abdomen may be more brownish and fore tibiae and tarsi are contrasting black. Antennal arista long-plumose. Mesopleuron with several hairs along posterior margin, pteropleuron with 2-3 strong setae and several additional hairs. Humeri, notopleura and lower pleura densely whitish pruinose. Male cerci markedly bifid apically. Posterior part of gonostyli with a spine-like tip, anterior part relatively short. Flat posterior part of ejaculatory apodeme large, sub-oval. Epiphallus small. Length: body 3.8-7.0 mm, Wing 3.6-6.0 mm.

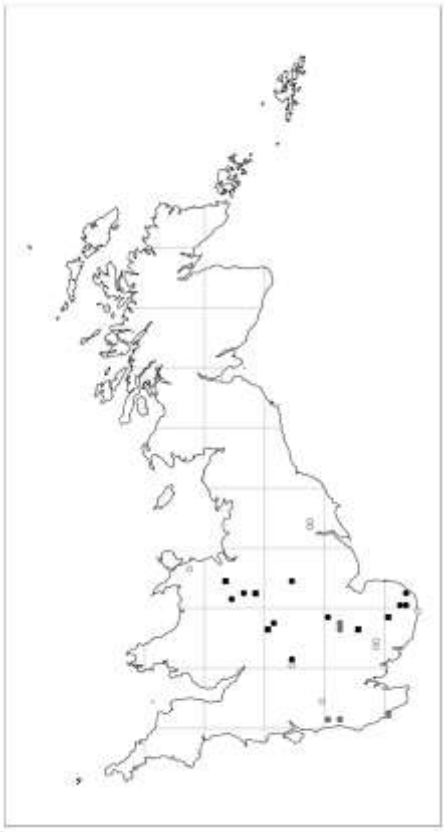
Distribution: Holarctic: in Europe from Lapland south to France, Ireland (Nash, 1975), through northern and central Europe to parts of European Russia and western Siberia; transcontinental in northern parts of the Nearctic. Rare, in alluvial wetlands and flood plains in Britain. Recorded from 8 hectads before 1980 and 19 hectads since. '**Vulnerable**' (RDB2) according to Falk (1991).

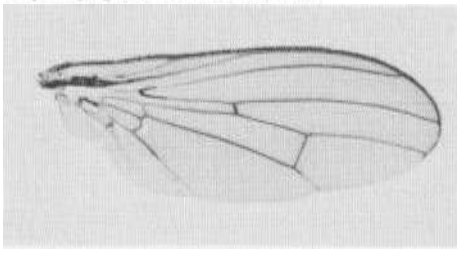
Biology: Seasonally flooded, damp grassland and fens with tall-herb communities. The larva is an internal parasitoid/predator/saprophage of Succineidae (*Succinea* and *Oxyloma*). The puparium was described by

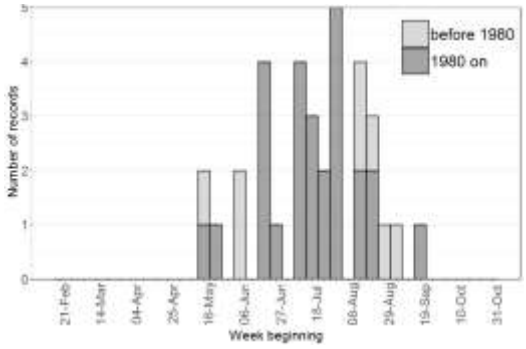
Foote (1959), is formed away from the host and the species over-winters in the puparium. The flight period extends from the middle of May to the middle of mid September.



Figs. 311-316. *Sciomyza dryomyzina* Zett. – 311: andrium in ventral view; 312: apical part of cercus, posterior and anterior part of gonostylus; 313: pregonite and postgonite; 314: aedeagus; 315: inner copulatory organ; 316: andrium in lateral view.







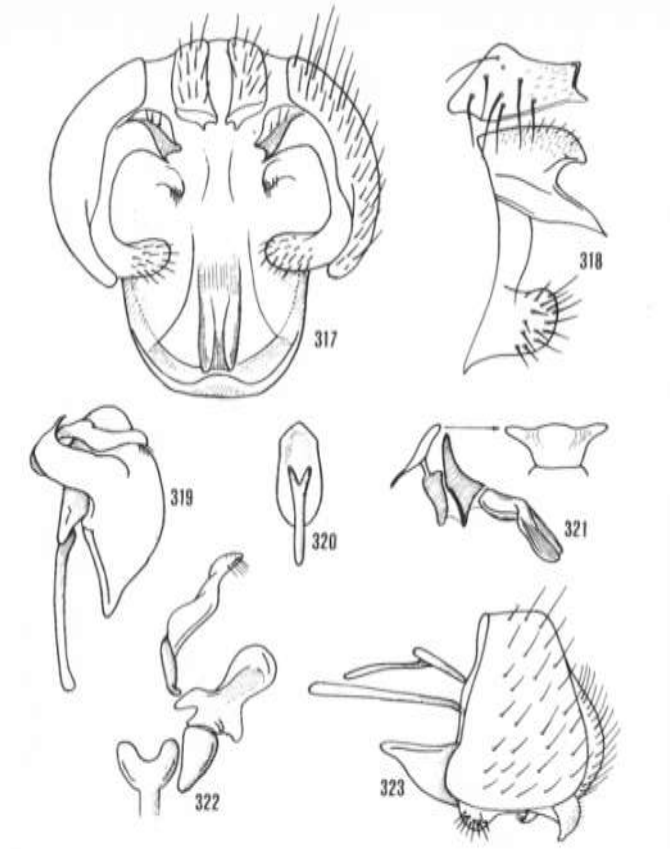
Sciomyza simplex Fallén, 1820

Sciomyza simplex Fallén, 1820a: 12.

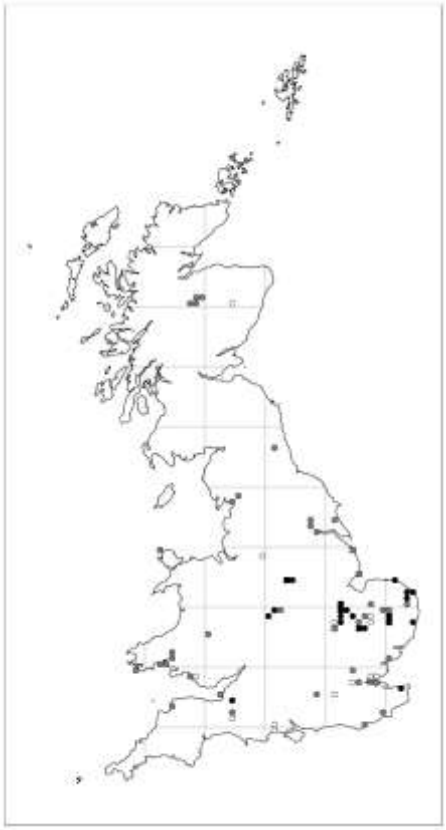
Description: Body mainly yellow to yellowish-brown, only central part of mesonotum greyish-black. Tips of fore tibiae and fore tarsi usually darkened, also abdomen often partly brown. Anterior half of frons (or more) matt, third antennal segment yellow, arista long-plumose. Humeri, notopleura and lower pleura densely whitish pruinose, upper pleura shining. Mesopleuron with hairs and setae along posterior margin, pteropleuron usually with several hairs and 3-5 strong setae. Male cerci bifid apically but both projections only short. Posterior part of gonostyli bilobed, anterior lobe pointed; anterior part of gonostyli rounded on inner side. Flat posterior part of ejaculatory apodeme elongate-oval, epiphallus well-developed, transverse. Length: body 5.0-7.8 mm, wing 5.0-6.7 mm.

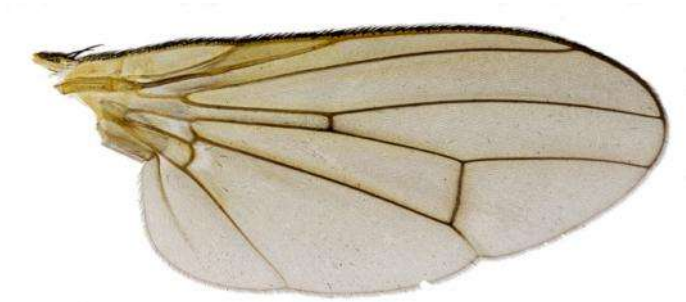
Distribution: Holarctic: in Europe from Lapland south to central France, Ireland eastwards through most of Europe to the Balkans and western Siberia and Kazakhstan; in North America mainly in the north-western region. Scarce, grazing marshes and other wetlands. Recently added to the Irish list (Gittings & Speight, 2010). Recorded from 13 hectads before 1980 and 61 hectads since. '**Notable**' according to Falk (1991).

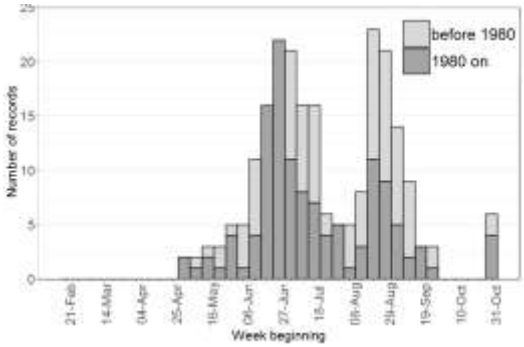
Biology: Adults occur in wetlands with tall emergent vegetation such as reed and sedge beds. The immature stages were described by Foote (1959) who observed the full life cycle in America. The larvae are parasitoids/predators of a range of freshwater and terrestrial gastropods, moving from one snail to another as they are consumed. The puparium may be formed inside or away from the host and the species over-winters in the puparium. The length of the larval life is 11-12 days, and the pupal period about 11 days. The flight period is from the middle of May to early October.



Figs. 317-323. *Sciomyza simplex* Fall. – 317: andrium in ventral view; 318: apical part of cercus, posterior and anterior part of gonostylus; 319: inner copulatory organ (without ejaculatory apodeme); 320: ejaculatory apodeme; 321: aedeagus; 322: pregonite and postgonite; 323: andrium in lateral view.







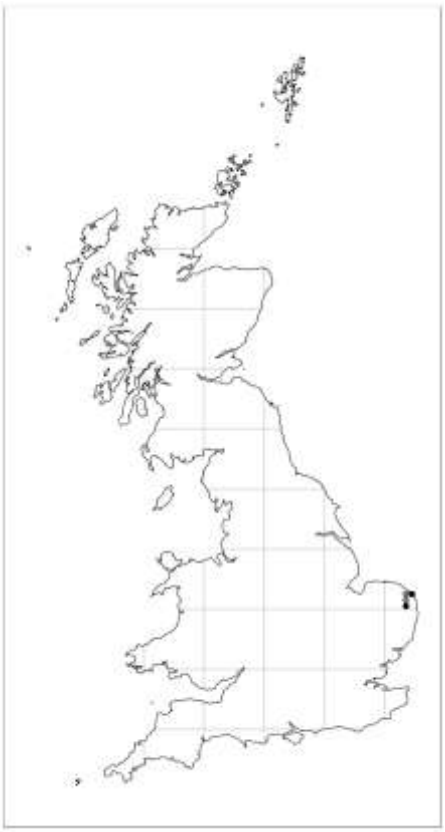
Sciomyza testacea Macquart, 1835

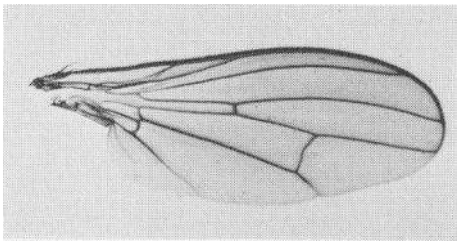
Sciomyza testacea Macquart, 1835: 406.

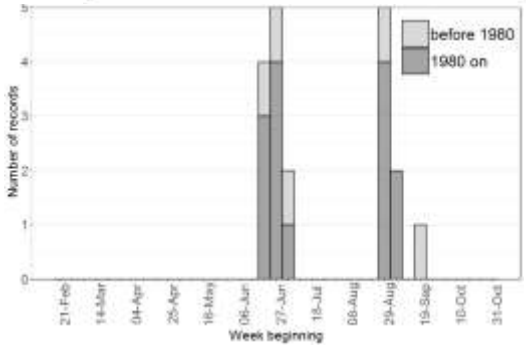
Description: Usually smaller than the other species of the genus, and well-characterised by the third antennal segment which is yellow basally with a strongly contrasting black apex. Frons entirely shining, arista long-plumose. Thorax uniformly reddish-yellow, humeral calli, notopleura and lower pleura densely whitish pruinose, other parts subshining or shining. Mesopleuron with several hairs along posterior margin, and pteropleuron with two setae and some additional hairs. Fore legs conspicuously darkened, usually black except for coxae and basal ⅓-½ of femora. Male cerci with a distinctly apical projection. Posterior part of gonostyli with a spine-like tip, anterior part rounded apically. Inner copulatory organ of the same type as in *S. simplex*, but ejaculatory apodeme and pregonites rather different. Length: body 3.8-4.9 mm, wing 3.0-5.0 mm.

Distribution: European: extending from southern Sweden and the Baltic republics of the USSR to France, Italy and Yugoslavia. Rare, Norfolk Broads. Recorded from 0 hectads before 1980 and 4 hectads since. Added to the British List by the East Anglian Fens Invertebrate Survey. Recently added to the Irish list (Gittings & Speight, 2010).

Biology: Wet woodland, seasonally flooded grassland with tall-herb communities, reed or sedge beds. The immature stages are undescribed, but it has been reared from *Succinea* species collected from tall herb vegetation in a heavily shaded wet woodland (Knutson, 1988). The flight period extends from the June to September. The records suggest two generations per year.







Genus *Tetanura* Fallén, 1820

Tetanura Fallén, 1820b: 10.
Type-species: *Tetanura pallidiventris* Fallén, 1820b (mon.).

This genus appears to be rather isolated in the tribe Sciomyzini. Mid-frontal stripe indistinct, frons completely shining, both orbital setae well-developed. Densely long whitish-pubescent arista in an unusual position, placed just before apex of third antennal segment. Prosternum bare, propleural seta long, hairs below anterior spiracle entirely absent. Mesopleuron bare, ptero- and sternopleuron haired. Inner posterior margin of hind coxae bare. Males with strikingly reduced gonostyli, females with a unique flat ovipositor.

The biology and immature stages of *T. pallidiventris* were studied by Knutson (1970a). The larvae live as typical parasitoids of several terrestrial snails. Only two species have been described, but *T. falleni* has not been recorded since it was first described. *T. pallidiventris* is very probably Eurasian in distribution, and the second species is known only from Central Europe.

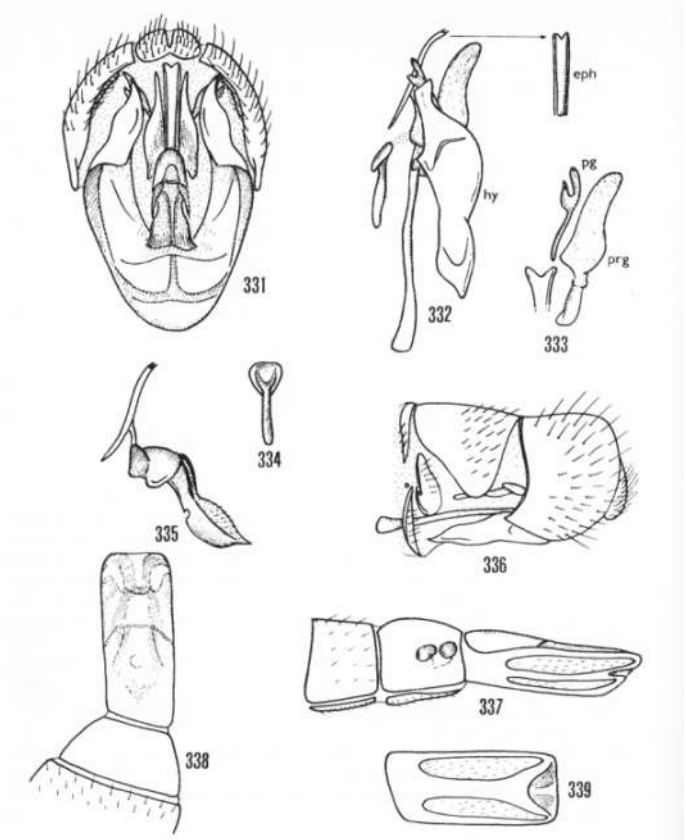
Tetanura pallidiventris Fallén, 1820

Tetanura pallidivetris Fallén, 1820b: 10.

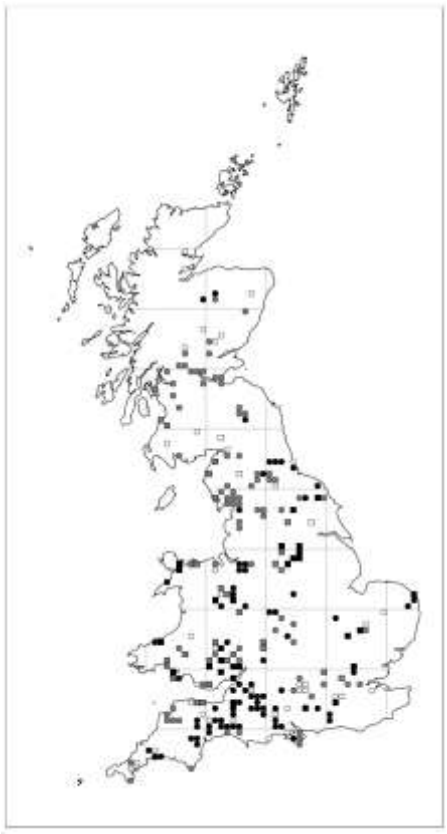
Description: A rather small species, resembling members of the genus *Pteromicra*. Head almost round in lateral view, cheeks hardly broader than third antennal segment. Anterior part of frons yellow to a varying extent, face often brownish. Subapical arista with long white pubescence, its dorsal hairs much longer than arista is broad at base. Body mainly shining, yellowish-brown to brown, disc of mesonotum regularly darker. Legs mainly yellow but fore tibiae and tarsi dark brown, sometimes also tips of fore femora darkened dorsally and hind femora with a brown apical ring. The usual anterior and anterodorsal setae on femora entirely absent. Wings usually with approximated cross-veins, but the position of posterior cross-vein rather variable. Male gonostyli remarkably reduced, only the vestiges of their posterior parts visible. Hypandrium large, elongated posteriorly; pregonites unusually long and postgonites bifid apically; epiphallus long and narrow, rest of aedeagus resembling *Pteromicra* species. Ejaculatory apodeme relatively short. Apical segments of female abdomen modified into a flat ovipositor that is unique within the entire family. Length: body 2.2-4.5 mm, wing 2.8-3.6 mm.

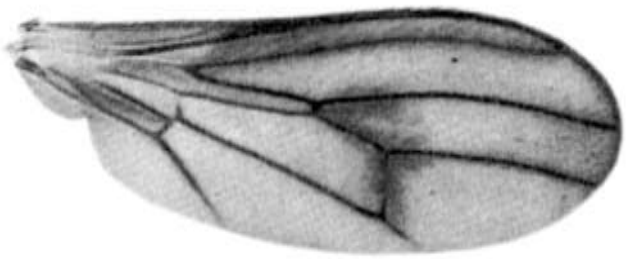
Distribution: Eurasian: in Europe from Lapland south to the Pyrenees and Ireland eastwards through central Europe to parts of European Russia, eastern Siberia and Japan. Widespread and sometimes abundant in shaded, damp usually ancient woodlands in Britain. Recorded from 38 hectads before 1980 and 209 hectads since.

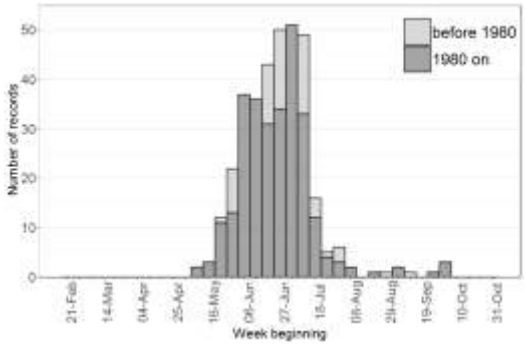
Biology: This species occurs almost exclusively in woodland habitats, preferring wet and shaded places in mixed forests. One of the few sciomyzids that is a true internal parasitoid of terrestrial gastropods. Females lay eggs directly on the soft parts of resting terrestrial snails, using their flattened and partly twisted ovipositor. In the field, larvae have been found in *Cochlicopa lubrica*, *Discus rotundatus* and *Aegopinella pura*. The larva crawls deep into the shell, between the mantle and the shell itself and thence into the snail's tissues. The exact length of the larval stage is not known, but the snail may remain alive for some months. The snail eventually dies and the larva completes development in the decaying tissues. The larva always pupates in the host snail shell and the puparium overwinters. There appears to be only one generation per year. The egg, larval cephalopharyngeal skeleton and puparium were described by Knutson (1970a). Flight period from late May or early June to late July.



Figs. 331-339. *Tetanura pallidiventris* Fall. – 331: andrium in ventral view; 332: inner copulatory organ; 333: pregonite and postgonite; 334: ejaculatory apodeme; 335: aedeagus; 336: male postabdomen in lateral view; 337 & 338: ovipositor in dorsal and lateral view; 339: apical part of ovipositor in ventral view. For abbreviations see p. 26.







Tribe Tetanocerini

Propleural seta absent, at most represented by a few short hairs. Second antennal segment very often elongated, even rod-like in some species. Sometimes ocellar setae, one orbital seta, one pair of scutellar setae or one of the postalar setae absent. Subalar setae present in some genera. Male abdominal left spiracles 6 and 7 usually situated in the sterna, and right spiracles 6 and 7 in right corner of sternum 8 (or sternum 7+8). A vestige of tergum 7 or 8 (or a secondary sclerite : ventral sclerite) found in many genera. Andrium often conspicuously asymmetrical (*Anticheta*, *Elgiva*, some *Tetanocera* spp.), and sometimes only the shape of the hypandrium and distiphallus distorting a probably secondary symmetry of the periandrium and gonostyli. Sternum 5 often modified, emarginated or narrow, and in *Hydromya* the shape of sternum 4 unique, produced into two cylindrical processes. Anterior part of gonostyli markedly reduced in most genera except for some species of *Renocera*, often distinct only as a small setose protuberance at base of posterior part of gonostyli. Pregonites usually absent and postgonites relatively small, usually bipartite and haired apically, somewhat longer only in *Psacadina*. Epiphallus or paraphallus not developed distiphallus usually complicated and asymmetrical.

The larvae live as snail egg eaters, as aquatic predators of snails and mussels, or as parasitoids of terrestrial snails including slugs.

Altogether 38 species of this tribe have been found in the British Isles.

Genus *Anticheta* Haliday, 1838

Anticheta Haliday, 1838: 187 (as subgenus of *Sciomyza*).
Type-species: *Tetanocera vittata* Haliday, 1833 (= *Sciomyza analis* Meigen, 1830) (mon.).
Heteropteryx Hendel, 1902a: 81.
Type-species: *Sciomyza brevipennis* Zetterstedt, 1846 (mon.) (preocc. by *Heteropteryx* Gray, 1835).
Hemitelopteryx Cresson, 1920: 51 (as n. name for *Heteropteryx* Hendel, 1902a).

Rather small, reddish-brown or at least partly black species. Arista with moderately long black hairs, ocellar setae well developed, anterior orbital seta sometimes absent. Mid-frontal stripe complete and shining. One or two pairs of scutellar setae, mesopleuron and pteropleuron entirely bare, subalar setae absent. Prosternum always bare. Hind tibia with two relatively strong preapical setae, dorsal and anterodorsal in position. R_1 ending at or beyond level of anterior cross-vein, wings somewhat reduced in one species. Postabdomen remarkably asymmetrical, including periandrium and gonostyli. Periandrium produced at least on right side into a large lobe, gonostyli differently shaped on each side. Sternum 5 large, asymmetrical, with one or two protuberances distally. Inner copulatory organ relatively small.

The larvae are known to feed solely on the eggs or embryos of snails for at least most of their development. Puparia may be found in spring along the edges of standing water or in flood refuse.

Altogether 13 species have been described, almost all from the Nearctic and Palaearctic regions, and most of them were revised by Steyskal (1960). There are six Palaearctic species, restricted mainly to northern and central Europe and four have been recorded from the British Isles.

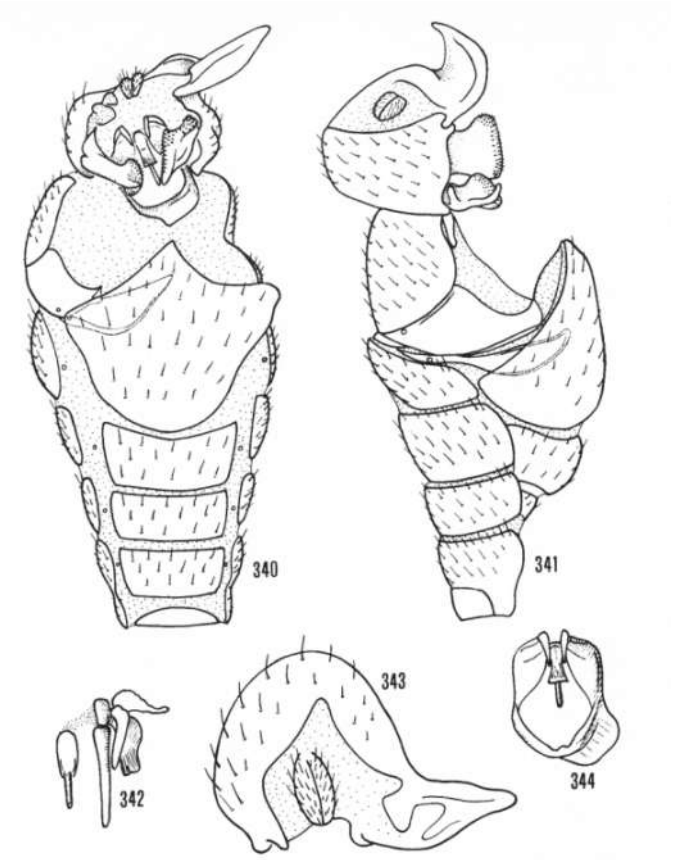
Anticheta analis (Meigen, 1830)

Sciomyza analis Meigen. 1830: 15.
Tetanocera vittata Haliday, 1833: 168.

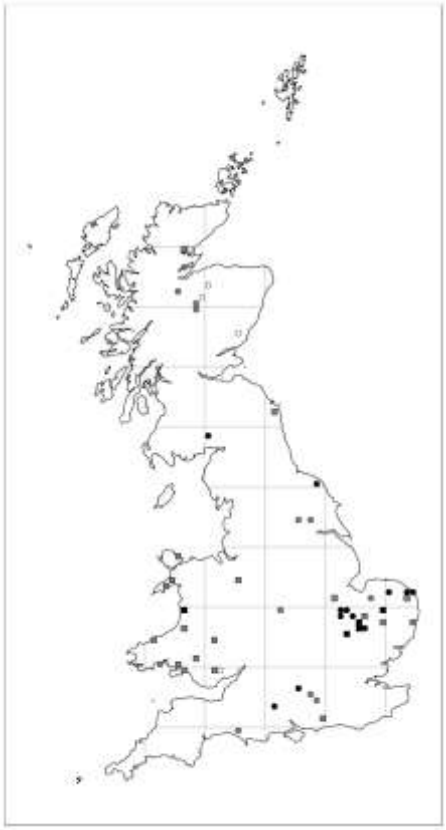
Description: Mainly yellow to reddish-brown species with two orbital setae. Only third antennal segment entirely black. Mid-frontal stripe band-shaped, shining brown, slightly broadened towards anterior margin of frons; rest of frons dull yellow. Arista somewhat thickened in basal third but not as strikingly as in *A. atriseta*, aristal hairs equalling half width of third antennal segment or almost so. Palpi blackish in apical half. Thorax and abdomen yellow and densely whitish pruinose, more brown only on prescutellar area, scutellum and dorsal part of abdomen. Legs mainly yellow, fore legs darkened, fore femora partly brownish, fore tibiae in apical half and fore tarsi blackish. Cross-veins on wings distinctly infuscated. Male sternum 5 pointed posteriorly, periandrium with a long process on right side. Gonostyli different in shape and size, inner copulatory organ small, hypandrium asymmetrical. Length: body 3.8-5.0 mm, wing 3.4-4.2 mm.

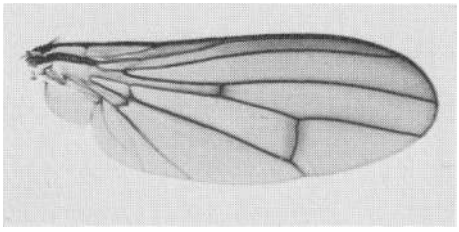
Distribution: A European species, extending from Lapland south to northern France, Ireland eastwards through central and southern Europe to European parts of Russia and Armenia. Widely scattered, but scarce in Britain, in old fens and *Carex* swamps. 'Vulnerable' according to Shirt (1987) revised to '**Rare**' (RDB3) by Falk (1991). Recorded from 5 hectads before 1980 and 48 hectads since.

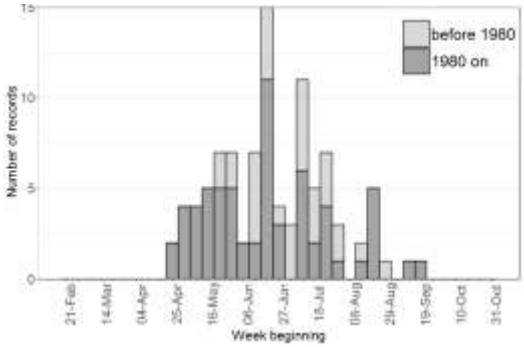
Biology: Adults have been collected in marshes and around seasonal pools, wet grasslands and the edges of raised bog. Knutson (1966) observed the complete life cycle. Larvae feed on exposed egg masses of the snail *Galba truncatula* on which the female had oviposited. Egg masses in at least partial shade were used and some occurred on dead stalks of *Sparganium* projecting above the water surface. The larvae remained within the egg mass with their posterior spiracles projecting. Puparia are formed in the empty egg mass. Over-wintering occurs in the puparium. Larvae fed on eggs and embryos of the snails for 19-29 days, and the pupal period lasted for 13 to 24 days. There are thought to be 2-4 generations per year. All immature stages were described by Knutson (1966). The flight period is from May to late August.



Figs. 340-344. *Antichaeta analis* (Meig.). – 340 & 341: male abdomen in ventral and lateral view; 342: inner copulatory organ in lateral view (without hypandrium); 343: andrium in caudal view; 344: inner copulatory organ in ventral view.







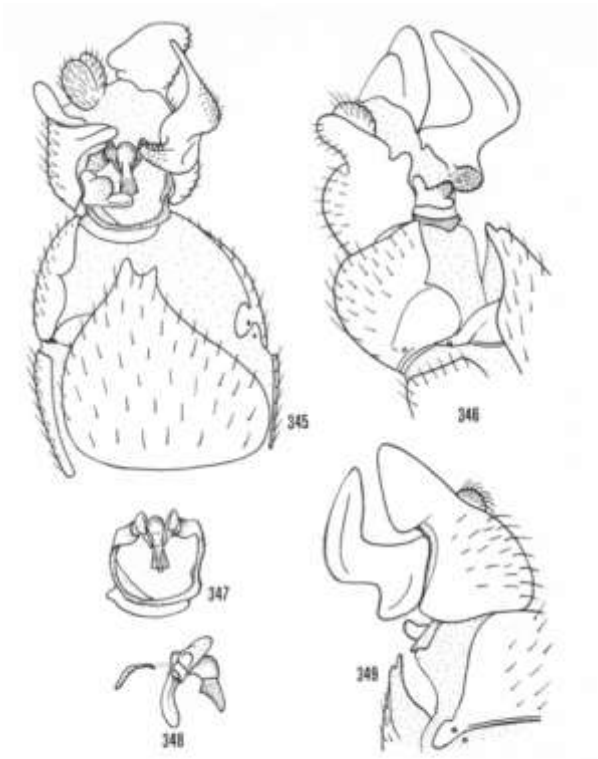
Anticheta atriseta (Loew, 1849)

Sciomyza atriseta Loew, 1849: 340.

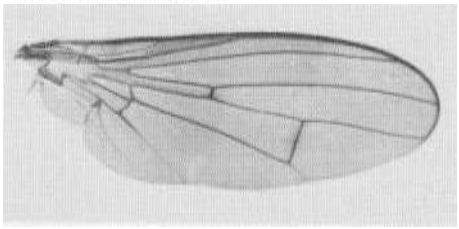
Description: A predominantly black species with mainly yellow antennae and legs. Only one orbital seta present. Mid-frontal stripe shining brown, very broad, band-shaped, with a fine median groove; rest of the frons velvety black. Antennal arista black, with very dense short hairs and strikingly thickened in basal third. Aristal hairs about as long as arista is broad at base. Third antennal segment mainly yellow, only blackish at base of arista. Thorax and abdomen subshining black, partly whitish pruinose, whitish pruinosity especially dense on lower pleura. Legs mainly reddish-yellow, only fore legs blackish except for basal ⅔ of femora and coxae. Wings greyish infuscated. Male periandrium with two posterior processes but the right one much longer. Right gonostylus also conspicuously larger than the left. Inner copulatory organ small as in other species of the genus. Length: body 3.6-4.5 mm, wing 3.2-4.3 mm.

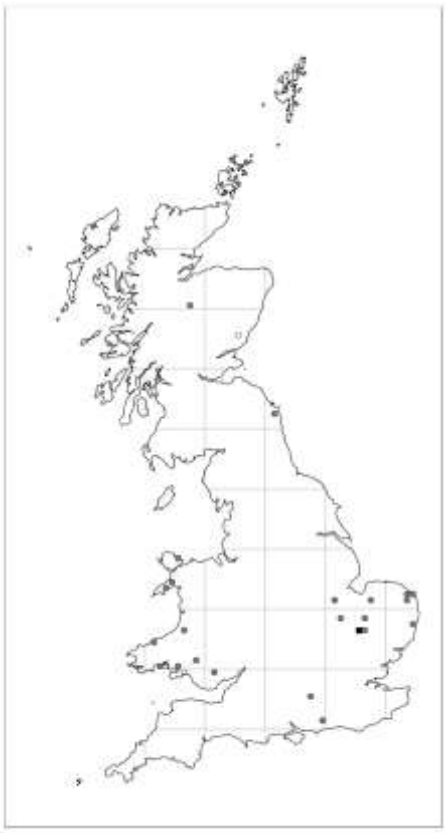
Distribution: A rare European species, extending from Fennoscandia south to France and Britain eastward to European parts of Russia. Added to the British list by Foster & Proctor (1997). Rare, mainly recorded from the Norfolk Broads. Recorded from 3 hectads before 1980 and 23 hectads since.

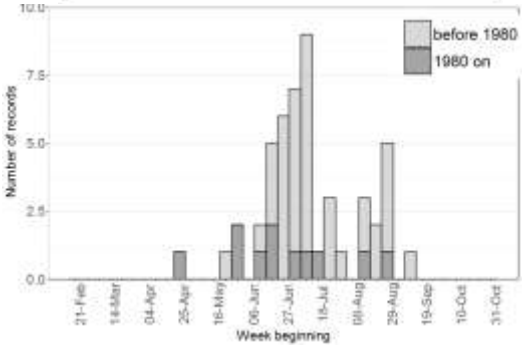
Biology: Adults occur in wet woodland, often along streams or rivers with dense vegetation such as *Equisetum*, *Carex* and *Iris*. Immature stages largely unknown. A puparium was mentioned by Knutson (1966) but no description was published. Flight period from May to the end of July.



Figs. 345-349. *Antichaeta atroseta* (Loew). – 345 & 346: male postabdomen in ventral and lateral view; 347: inner copulatory organ in ventral view; 348: the same in lateral view (without hypandrium); 349: andrium from right side.







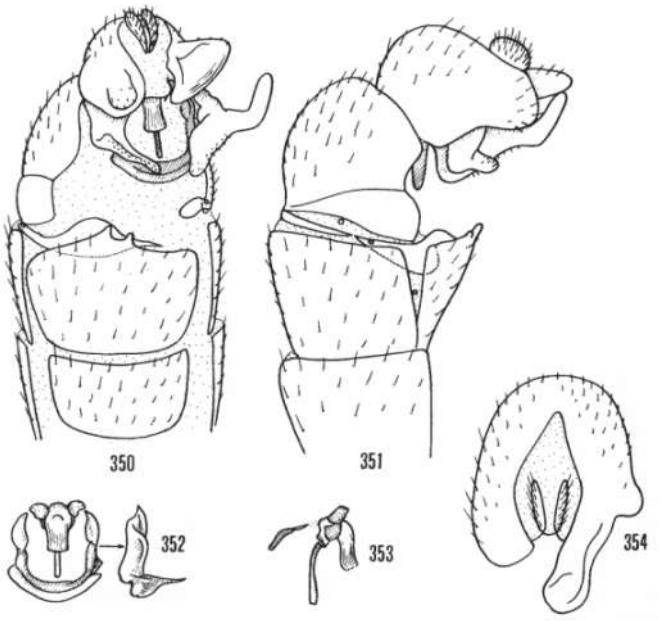
Anticheta brevipennis (Zetterstedt, 1846)

Sciomyza brevipennis Zetterstedt, 1846; 2102.

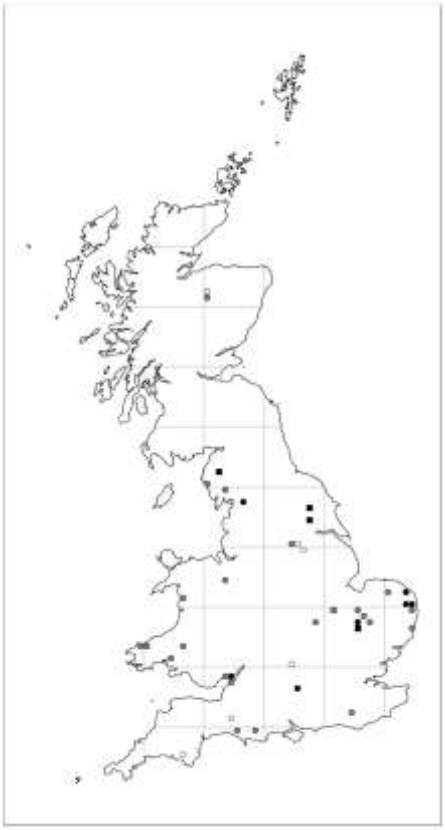
Description: Black and yellow species, with remarkably narrow and short, brownish-infuscated wings. Setae partly reduced: only one orbital seta, presutural and anterior dorsocentral setae absent, only one postalar seta. Mid-frontal stripe shining black, broad, with a fine median groove, leaving only narrow parts of the frons velvety-black. Antennae completely orange, but arista more brown. Aristal hairs short, hardly equalling half width of third antennal segment. Cheeks very narrow. Thorax with dark brown and subshining mesonotum and scutellum, pleura mainly yellow, lower pleura densely whitish pollinose. Legs mainly yellow, fore legs darkened as from apical third of femora but last two tarsal segments white. Hind femora with a brown apical ring. Abdomen subshining dark brown to black. Male sternum 5 with 2 posterior protuberances. Periandrium with two posterior processes, the right one much longer. Both gonostyli relatively large, right gonostylus with a long cylindrical projection. Hypandrium almost symmetrical. Length: body 3.4-5.0 mm, wing 2.2-3.2 mm.

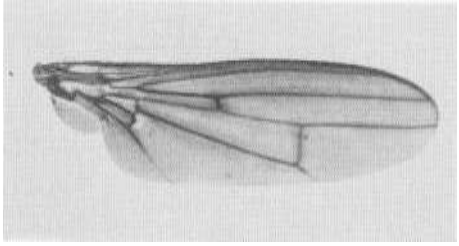
Distribution: A European species, known from southern Fennoscandia south to central France, Ireland eastwards through north and central Europe into the European parts of Russia. Scarce in Britain, often in dense vegetation beside ditches or ponds. Recorded from 7 hectads before 1980 and 34 hectads since. '**Vulnerable**' (RDB2) according to Falk (1991).

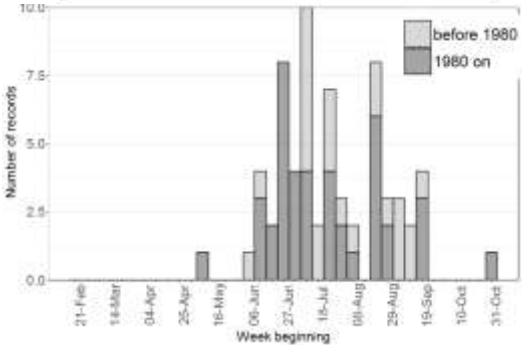
Biology: Adults may be locally abundant in damp and shaded habitats with herbaceous vegetation near the margins of woods and the edges of vernal pools and marshes. Eggs and larvae were found on and in the egg masses of *Succinea* sp. in Denmark, but larvae also developed on the eggs of *Lymnaea truncatula* in the laboratory. For the first few days, the larvae fed on the gelatinous matrix of the egg capsules, but later mainly on the snail embryos. Pupation occurs within or away from the consumed egg mass. The entire larval stage took 17-22 days, and the pupal period 16-25 days. The species overwinters in the puparium. Puparia were found in spring floating at the edges of standing water. All immature stages were described by Knutson (1966). The flight period from June to the end of August or early September.



Figs. 350-354. *Antichaeta brevipennis* (Zett.). – 350 & 351: male postabdomen in ventral and lateral view; 352: inner copulatory organ in ventral view and hypandrium in lateral view (on the right); 353: the same in lateral view (without hypandrium); 354: andrium in caudal view.







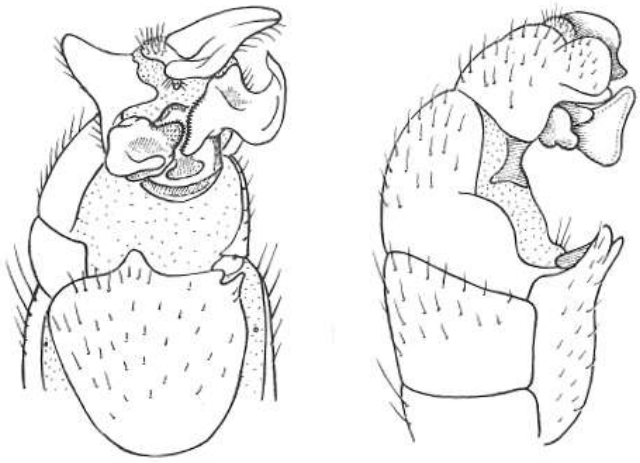
Anticheta obliviosa Enderlein, 1939

Antichaeta obliviosa Enderlein, 1939: 209.

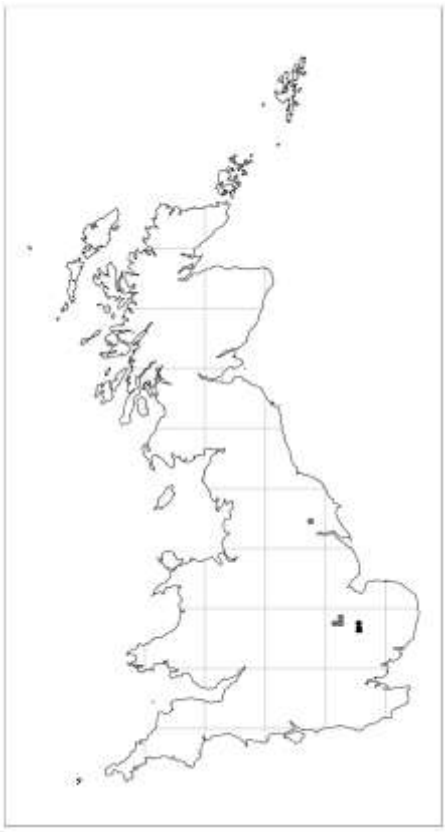
Description: A dark species with mainly yellow head and legs, resembling *A. aristata* but with two orbital setae. Frons reddish-yellow, mid-frontal stripe shining brown. Antennae yellow, only dorsal side of third antennal segment darkened, arista black, short-haired, palpi black. Thorax, including scutellum and abdomen, brownish-black. Legs mainly ochre-yellow, only fore legs darkened; fore femora brown, tibiae and tarsi blackish, last tarsal segment yellowish. Wings slightly brownish infuscated, membrane along both cross-veins darker. Male genitalia not examined, only females available. Length: body 4.0-5.0 mm, wing 4.2-4.6 mm.

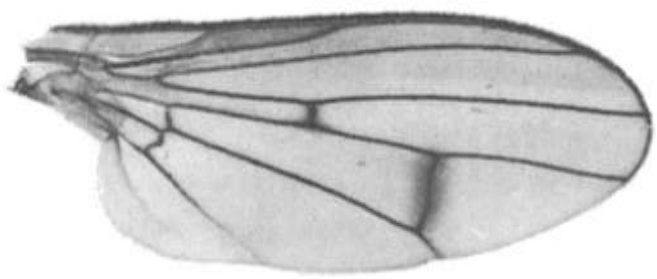
Distribution: A rare European species known from Denmark, Britain, Belgium, Germany, France, Hungary and Italy. Added to the British list by Cole (1988) and only known from a few sites in the Huntingdon district, including Woodwalton Fen NNR. Recorded from 0 hectads before 1980 and 6 hectads since. '**Vulnerable**' (RDB2) according to Falk (1991).

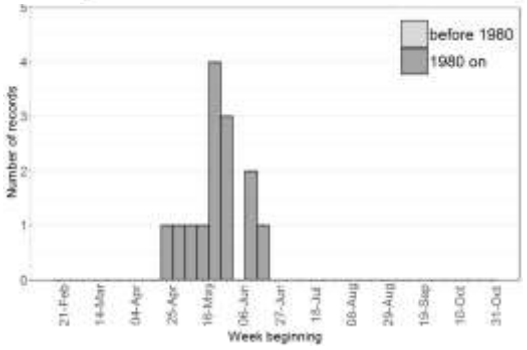
Biology: Adult in wet woodland and well-vegetated margins of water in open areas of woods. Immature stages unknown. The puparium is the overwintering stage. Probably univoltine. The adults have been collected from April to late June.



A. obliviosa, male postabdomen in ventral and lateral view







Genus *Coremacera* Rondani, 1856

Coremacera Rondani, 1856: 106.
Type-species: *Musca marginata* Fabricius, 1775 (orig. des.).
Statinia Meigen, 1800: 36.
Type-species: *Musca marginata* Fabricius, 1775 (subseq. mon. in Latreille, 1802: 461) (suppressed by I.C.Z.N., 1963: 339).

Medium-sized to large species characterised by the setose apex of third antennal segment. Two orbital setae; mid-frontal stripe usually broad and shining, sometimes indistinct because frons completely shining or, on the contrary, at least partly pollinose. A large, velvety black spot may be present around base of anterior orbital seta, and may even reach to the base of posterior orbital seta or be completely absent. Lunula clearly visible, transverse, band-shaped and shining. Face markedly concave. Prosternum, mesopleuron and pteropleuron entirely bare, subalar setae missing. Hind tibia with only one preapical seta, in an anterodorsal position, inner posterior margin of hind coxa without hairs. Ventral side of hind femora densely setose in males and with several posteroventral setae in females. Wings with a reticulate pattern. Male sternum 5 sometimes narrow, sternum 6 well-developed ventrally, usually with two posterior protuberances, sternum 7 only small. Andrium and gonostyli symmetrical, hypandrium and aedeagus asymmetrical. Aedeagal apodeme somewhat dilated apically, ejaculatory apodeme usually sickle-shaped.

The biology is known only in *C. marginata*, but it is probable that other species of the genus also live as parasitoids of terrestrial snails in the larval stage, like the larva of *C. marginata*.

Twelve species are known to belong to this exclusively Palaearctic genus. Only *C. marginata* (Fabr.) has been recorded in the British Isles.

Coremacera marginata (Fabricius, 1775)

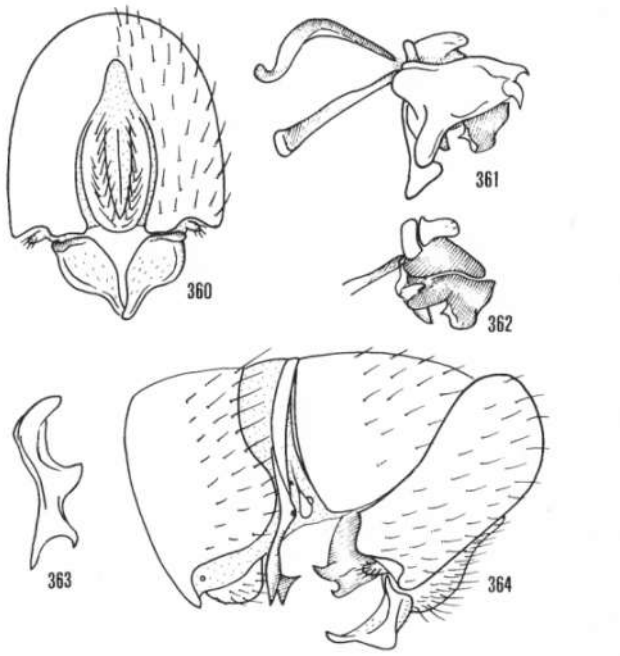
Musca marginata Fabricius. 1775: 784.
Musca tristis Harris, 1780: 115.
Tetanocera crinicornis Fallen, 1820a: 5.

Description: Dark brown to blackish species with darkened legs and dark brown wings with numerous hyaline spots. Frons yellowish-brown, subshining, mid-frontal stripe of the same colour, generally more shining, broad and reaching anterior margin of frons. A velvety black elongate-oval spot surrounding bases of orbital setae on each side of frons. Lunula broad, shining brown. Arista with a long and dense pubescence consisting of whitish hairs. Face without a central black spot. Mesonotum greyish with numerous brownish spots. Legs mainly dark brown, only tips of femora and proximal parts of tibiae and tarsi often paler. Male gonostyli relatively broad and short, simply pointed. Male sternum 5 somewhat narrow, emarginated posteriorly. Sternum 6 with two pointed posterior protuberances. Posterior process of hypandrium bifid apically. Length: body 6.0-9.8 mm, wing 4.8-7.0 mm.

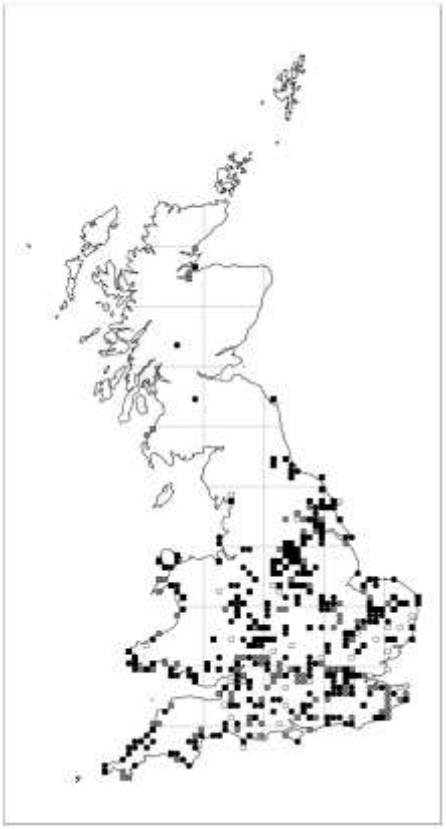
Distribution: A Eurasian species; widespread in Europe from Scandinavia to the Mediterranean and eastwards to European Russia and, as *C. marginata pontica,* also recorded from Georgia, Armenia,

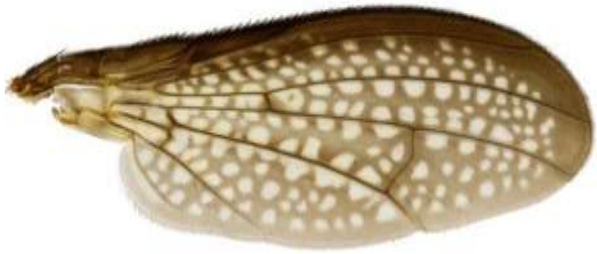
Azerbaijan, Turkey and Iran. Fairly common in calcareous grasslands and occasionally wetlands in England and Wales, only recorded from a restricted area around the Moray and Dornoch Firths in Scotland. Recorded from 33 hectads before 1980 and 373 hectads since.

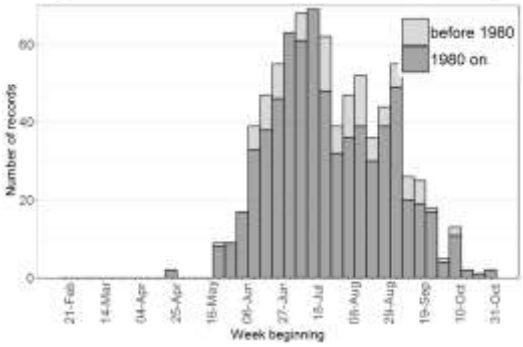
Biology: A species of open ground; unimproved and lightly grazed grassland. Often in relatively dry habitats such as coastal dunes and especially on calcareous soils. Knutson (1973) described and figured the larva and puparium. Eggs are laid on snails or in their vicinity. The larvae is a predator of various terrestrial snails, preferring mainly *Cochlicopa* and *Discus* species in the laboratory, but has also been reared on many other species. The newly-hatched larvae feed in the first snail for about one month whilst the infested snail may live for as long as 10 days, so that the larva then continues feeding on the decaying tissues for many days. The second snail is killed more quickly, in one or two days. Only rarely does the same larva attack a third snail. The larval stage lasts from 22 to 97 days, and the pupal period from 47 to 124 days. The puparia are formed outside the shells, and the species appears to over-winter as a mature larva or puparium. The adults have been collected from late May to early October.



Figs. 360-364. *Coremacera marginata* (Fabr.). – 360: andrium in caudal view; 361: inner copulatory organ; 362: aedeagus and postgonite; 363: 6th sternum in ventral view; 364: male postabdomen in lateral view.







Genus *Dichetophora* Rondani, 1868

Dichetophora Rondani, 1868: 200.
Type-species: *Scatophaga obliterata* Fabricius, 1805 (orig. des.).

Medium-sized species with yellowish-brown ground-colour and finely and sparsely reticulate wings. Mid-frontal stripe band-shaped, broad and shining, lunula also clearly visible and broad. Antennae elongated, third segment tapered towards apex, antennal arista densely whitish pubescent. Some setae weak (humerals, sometimes also anterior orbitals and ocellars) or absent (presuturals, anterior dorsocentrals, prescutellars, basal scutellars, sometimes also one postalar). Prosternum, meso- and pteropleuron bare, subalar setae absent. Short but strong, spine-like antero- and posteroventral setae present on apical third (or more) of all femora, often only weakly distinct on middle pair but usually strong along entire apical half of posterior pair in both sexes. Inner posterior margin of hind coxae haired. Wings relatively narrow and long, posterior cross-vein unusually oblique. Male genitalia with narrow and pointed gonostyli, hypandrium almost symmetrical. Aedeagus stout and complicated, ejaculatory apodeme sickle-shaped.

The few species that have been studied, which include only one of the European species (Vala *et al*. 1987), suggest a predaceous mode of larval life.

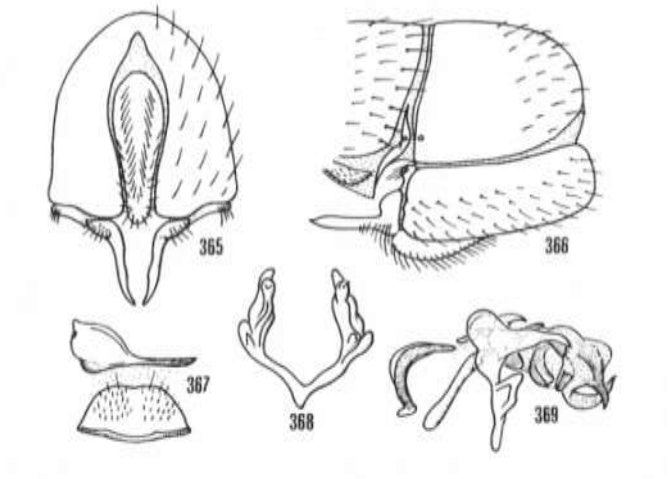
Dichetophora finlandica Verbeke, 1964

Dichetophora finlandica Verbeke, 1964a: 17.
Dichetophora obliterata auct. nec Fabricius, 1805: 205.

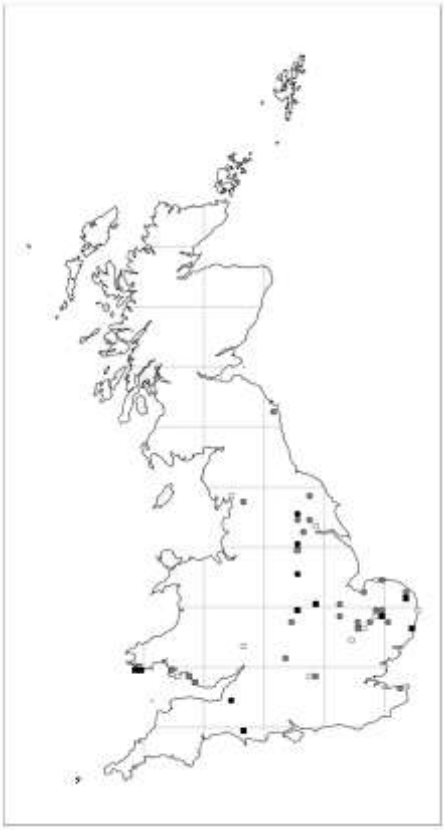
Description: Very similar to *D. obliterata* but usually somewhat smaller. Apical half of third antennal segment longer and more pointed. Thorax yellowish-brown, mesonotum darkened, upper pleura with a broad brown subnotopleural band, other parts of thorax densely whitish pruinose. Only one postalar seta on each side. Further differences are to be found in the male genitalia: gonostyli slender and pointed, not swollen in apical half; sternum 5 almost semicircular; sternum 6 with a simple slender ventral process; hypandrium subtriangular, almost symmetrical in ventral view; ejaculatory apodeme sickle-shaped, with a distinct dorsal ridge. Length: body 4.5-6.0 mm, wing 3.8-4.8 mm.

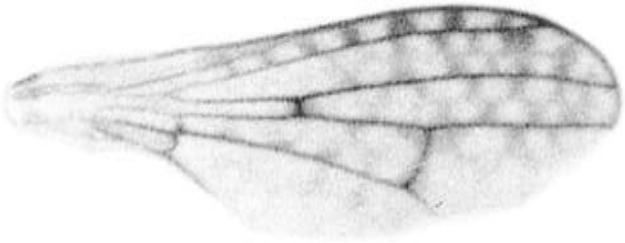
Distribution: A European species, extending from central Fennoscandia and the Baltic states south to the Alps (France, Switzerland, Italy, Austria), Britain eastwards through northern and central Europe to parts of the former Yugoslavia and European Russia. In Britain, widely scattered records in England and Wales, mainly from the Eastern half of England and the south coast of Wales. Scarce on calcareous grassland and wetlands. Recorded from 10 hectads before 1980 and 37 hectads since. 'Endangered' according to Shirt (1987), revised to '**Rare**' (RDB3) by Falk (1991).

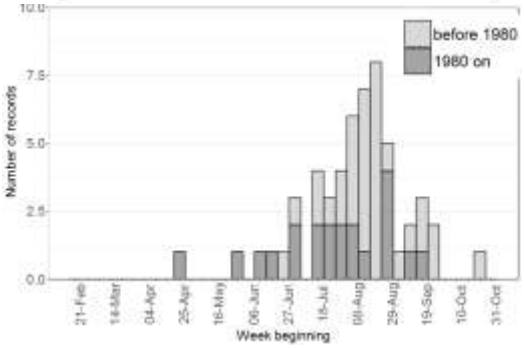
Biology: Immature stages unknown. The larvae probably feed as predators on aquatic pulmonate snails. Adults have been collected amongst grass and herbaceous vegetation alongside the exposed margins of woods, in marshes, bogs, and alongside streams. Also from sand dunes in South Wales and at Witherslack (Cumbria). The flight period is from June to the end of August or beginning of September, occasionally into October.



Figs. 365-369. *Dichetophora finlandica* Verb. – 365: andrium in caudal view; 366: male postabdomen in lateral view; 367: sterna 5 and 6 of male; 368: hypandrium in ventral view; 369: inner copulatory organ.







Dichetophora obliterata (Fabricius, 1805)

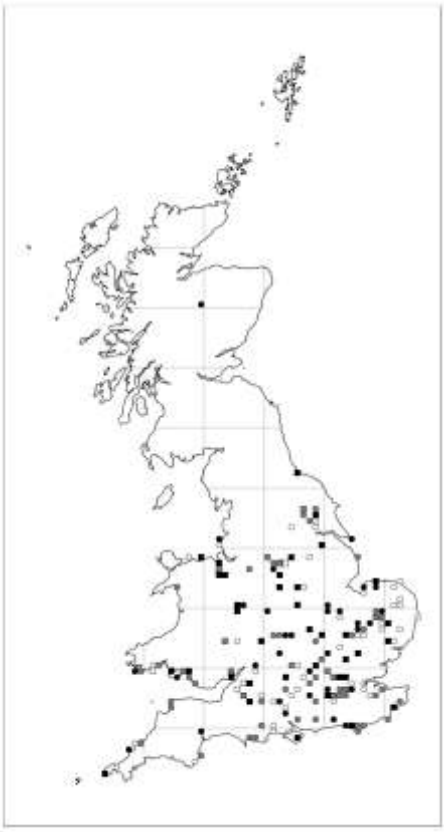
Scatophaga obliterata Fabricius, 1805.

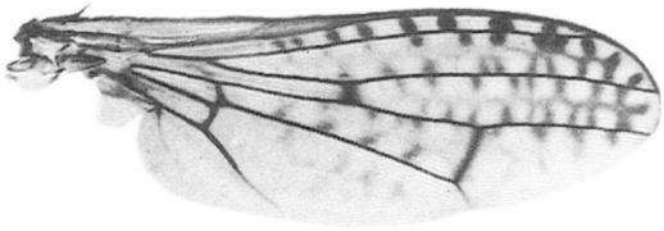
Description: Usually stouter and larger than *D. finlandica*. Third antennal segment relatively shorter and rather dull. Two postalar setae on each side of the thorax. Male genitalia with gonostylus somewhat swollen in apical half; ventral process of sternite 6 enlarged in the middle. Body length: 4.6-6.0 mm, wing length 3.8-4.8mm.

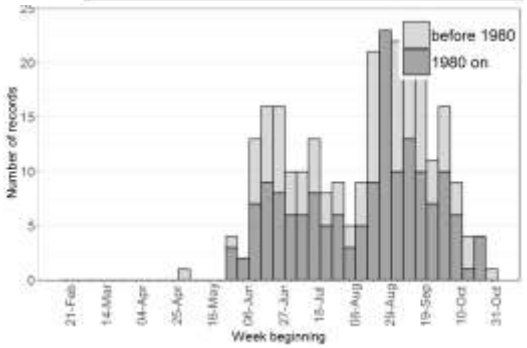
Distribution: A European species known from the Atlantic and central parts of Europe eastwards to Romania and round the Mediterranean basin to Turkey and Morocco, Iran, Iraq and Syria. Local on calcareous grassland, dunes and wetlands in England and Wales. Recorded from 45 hectads before 1980 and 126 hectads since.

Biology: Adults occur along forest margins and in partially shaded, unimproved grassland. Eggs are laid, after a prolonged pre-oviposition period of up to 2 months, on the shells of living terrestrial snails. Larvae are predatory and/or saprophagous on terrestrial snails. In the laboratory, first instar larvae fed as internal parasitoids on *Lauria cylindracea* and later instars fed on *Helicella* and *Theba* spp. This species has an unusually low feeding rate, completing development on just two individuals of the small *L. cylindracea* and in one *Helicella* sp. of 5 mm diameter (Vala *et al*. 1987). The puparium is formed either in the host shell or away from it. Over-wintering occurs as the larva. This appears to be a univoltine species despite its long flight period: from mid or late May to mid October.

D. obliterata, gonostylus.







Genus *Dictya* Meigen, 1803

Dictya Meigen, 1803: 277.
Type-species: *Musca umbrarum* Linné, 1758 (subseq. des. by Steyskal, 1965b: 689).
Monachaetophora Hendel, 1900: 355.
Type-species: *Musca umbrarum* Linné, 1758 (mon.).

Medium-sized, mainly greyish species with brown spots on head, thorax, abdomen, and legs, and with a characteristic pattern on the wings. Always only one orbital seta present. Mid-frontal stripe virtually indistinct or only very narrow. Second antennal segment subquadrate, arista black, moderately long-plumose. Face white with a black central spot, Prosternum and mesopleuron haired, the latter with one

seta, pteropleuron with several hairs and one strong seta. Subalar setae absent, all other thoracic setae well-developed. Hind tibia with one preapical seta in an anterodorsal position, inner posterior margin of hind coxae haired. Wings intensively brownish infuscated, with numerous pale spots. Male genitalia very characteristic, with posteriorly elongated and exposed gonostyli. Protandrium almost symmetrical including a characteristic medioventral vestige of sternum 6. Hypandriurn unusually short but with a long posterior process.

The biology of the European *D. umbrarum* has not been studied in detail but some published notes as well as the results of laboratory rearing suggest that the larva of this species is also one of the predators of aquatic pulmonate snails, as are many of the American species. However, the known larvae of the American species probably have a much broader range of prey, also attacking operculate aquatic snails, some terrestrial snails including slugs, and egg masses of *Physa* spp. Thirty species of the genus are known from the New World, and a single species is widely distributed in the Palaearctic region.

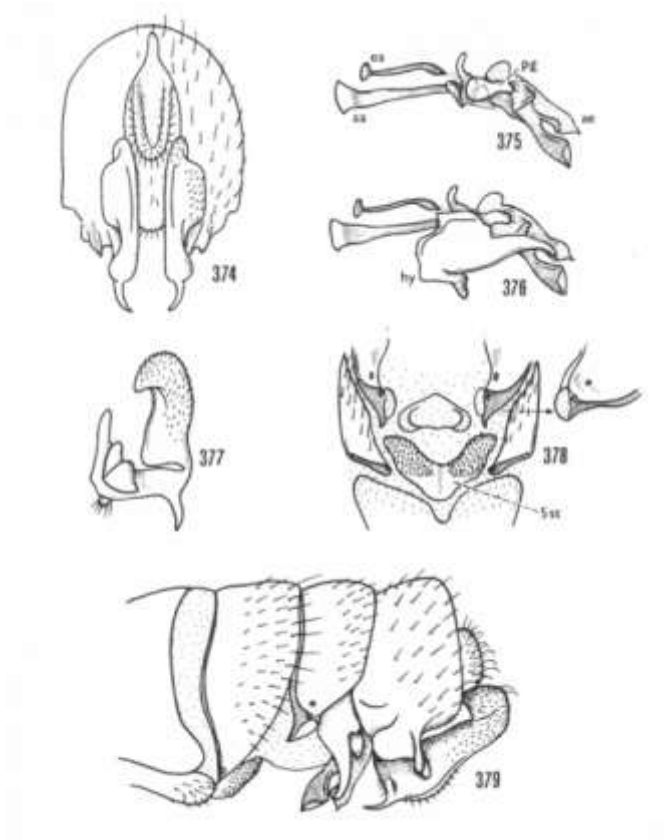
Dictya umbrarum (Linné, 1758)

Musca umbrarum Linné, 1758: 599.

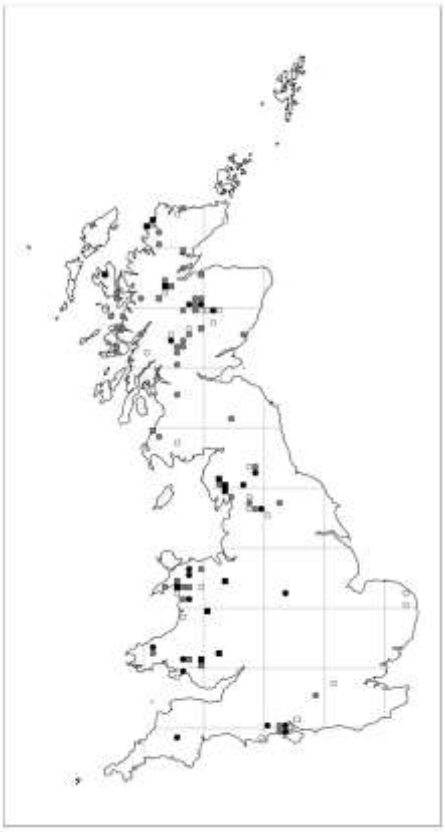
Description: Ground-colour greyish-brown, extensive parts of body whitish-grey pollinose. Head with rounded brown spots in place of the missing anterior orbital setae and with more diffuse brownish spots around bases of other setae, with reddish-brown triangles between antennae and eyes, a black central spot on face, and elongate brown spots below eyes. Mesonotum greyish, with brown spots forming 4 incomplete longitudinal stripes. Further brown spots at bases of thoracic setae. Legs and abdomen conspicuously brown and grey spotted. Wings with a characteristic brown pattern. Male postabdomen almost symmetrical. Sternum 5 narrow, deeply emarginate posteriorly, covered with short spines. Sternum 6 forming a symmetrical medioventral vestige. Hypandrium with a slender, long and pointed posterior process. Length: body 4.4-6.8 mm, wing 3.6-5.8 mm.

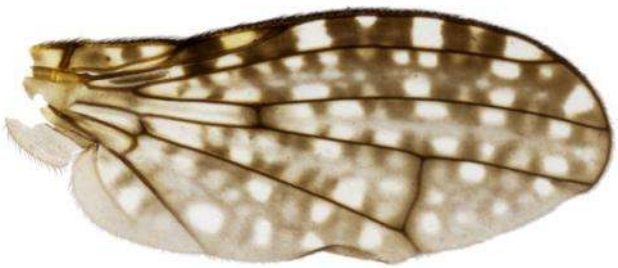
Distribution: Eurasian: Iceland, the Faeroes, Scandinavia and the Baltic states south to the mountainous parts of southern France, Ireland eastwards through most of Europe to the Ukraine and throughout Siberia. Mainly northern and western in Britain on flushed peatlands (often in the uplands), also from the New Forest. Recorded from 24 hectads before 1980 and 84 hectads since. '**Notable**' according to Falk (1991).

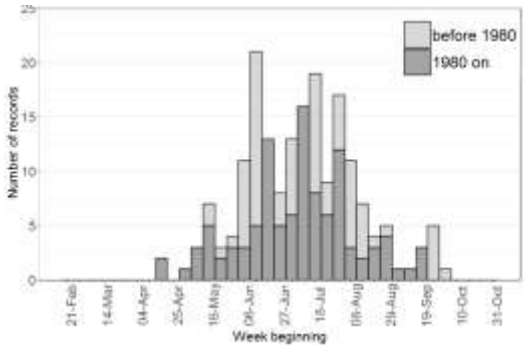
Biology: Adults have been collected on herbaceous vegetation around ponds, lakes, marshes and bogs, including raised bog and blanket bog. An account of its development was published by Willomitzer & Rozkošný (1977). The complete life cycle was observed in the laboratory upon living *Stagnicola palustris* and *Lymnaea tormentosa*. The larvae are aquatic predators. One female laid up to 352 eggs in 65 days. The length of the larval stage was 13-27 days, and of the pupal period 7-43 days. The puparium is formed away from the host. Lundbeck (1923) reared adults from floating puparia found in the field. The species is probably multivoltine, with a variable number of generations each year, and over-wintering probably occurs in the puparium. The flight period is relatively long, extending from April to late September.



Figs. 374-379. *Dictya umbrarum* (L.). – 374: andrium in caudal view; 375 & 376: inner copulatory organ, without hypandrium and complete; 377: gonostylus in lateral view; 378: 5th and 6th sterna in ventral view; 379: male postabdomen in lateral view.







Genus *Ectinocera* Zetterstedt, 1838

Ectinocera Zetterstedt, 1838: 743.
Type-species: *Ectinocera borealis* Zetterstedt, 1838 (mon.).

A monotypic genus, characterised by a strikingly elongated third antennal segment. Mid-frontal stripe broad and shining, tapered towards anterior margin of frons. Rest of frons between mid-frontal stripe and shining orbital plates velvety brown to black. Two orbital setae. Third antennal segment tapered, about 3 times as long as broad at base, with whitish, densely pubescent arista. Cheek only slightly narrower than

half width of eye. Prosternum, meso- and pteropleuron entirely bare, other thoracic setae distinct. Only one dorsal preapical seta on hind tibia, inner posterior margin of hind coxa without hairs. Wings almost hyaline, both cross-veins close together. Male genitalia resembling those of *Tetanocera* spp. but periandrium not fused below cerci. Gonostyli stout and rounded, postgonites bipartite, distiphallus with a wart-like surface structure. Ejaculatory apodeme very small.

Virtually nothing is known about the biology. The only species of the genus has a boreo-montane distribution in Europe and seems to be confined to forests.

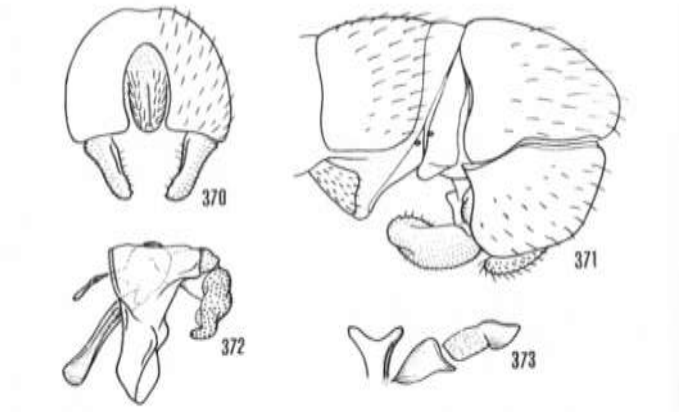
Ectinocera borealis Zetterstedt, 1838

Ectinocera borealis Zetterstedt, 1838: 743.
Tetanocera sciomyzina Zetterstedt, 1846; 2145.
Ectinocera vicaria Pokorny, 1887: 418.

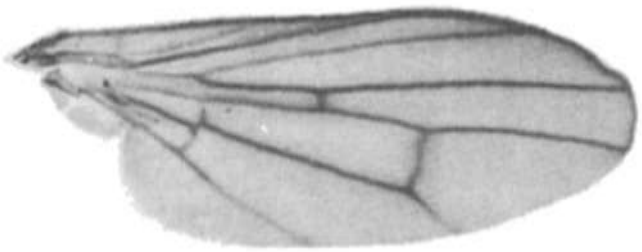
Description: A rather small, dark brown species with yellowish antennae and legs. Anterior part of frons, parafacialia and greater part of cheeks yellow. Antennae mainly yellow, arista white and third segment darkened except for base. Thorax and abdomen shining brown, mesonotum greyish pollinose, lower pleura densely whitish dusted, legs yellow but fore coxae almost white and fore femora brownish in apical third. Fore tibiae and tarsi dark brown to black. Male genitalia as above. Length: body 3.8-4.8 mm, wing 3.2-4.2 mm.

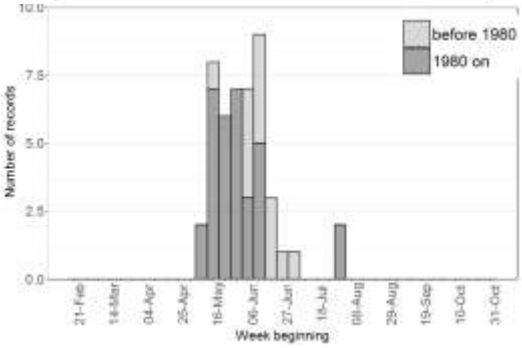
Distribution: European: Fennoscandia south to Germany, Britain eastwards through central Europe to the Alps (France, Switzerland, Austria, Italy); European parts of Russia. Mainly Caledonian Pine Forest in Scotland, but a few records from other habitats in the North of England, Wales and a record from Devon (in coastal, Sessile Oak woodland). Recorded from 11 hectads before 1980 and 22 hectads since. '**Rare**' (RDB3) according to Falk (1991).

Biology: Unknown. The species has been collected mainly in densely shaded coniferous forests, but also closed canopy deciduous woodland. The flight period is from the middle of May with most records in June, occasionally into the first half of July.



Figs. 370-373. *Ectinocera borealis* Zett. – 370: andrium in caudal view; 371: male postabdomen in lateral view; 372: inner copulatory organ; 373: pregonite and postgonite.





Genus *Elgiva* Meigen, 1838

Elgiva Meigen, 1838: 365.
Type-species: *Musca cucularia* Linné, 1767 (subseq. des. by Rondani, 1856: 106).
Hedroneura Hendel, 1902b: 265.
Type-species: *Musca cucularia* Linné, 1767 (subseq. des. by Cresson, 1920: 81).

This genus is characterised by haired pleura and by a characteristic, strongly S-curved posterior cross-vein. Always two orbital setae, mid-frontal stripe band-shaped, rounded anteriorly, almost reaching anterior margin of frons. Lunula transverse, stripe-like, clearly visible. Second antennal segment almost as long as the third, the latter sub-triangular, tapered anteriorly. Antennal arista virtually bare at base, very short whitish pubescent on apical two-thirds. Presutural, anterior dorsocentral and prescutellar setae on thorax absent. Prosternum usually bare but haired in *E. divisa*, meso- and pteropleuron haired, one strong mesopleural seta present in *E. cucularia*, subalar setae absent. Only one rather short preapical anterodorsal seta on hind tibia, hind femur with a row of short and strong antero- and posteroventral setae in apical half. Inner posterior margin of hind coxae haired. Posterior cross-vein strongly S-shaped, wings regularly with a few brownish spots. Male genitalia with somewhat asymmetrical gonostyli but with an almost symmetrical and narrow hypandrium. Ventral process of sternum 6 slender, simple and pointed.

The biology and immature stages were studied by Knutson & Berg (1964) and Rozkošný (1967). The known larvae are vigorous predators of aquatic snails of the families Lymnaeidae, Physidae and Planorbidae, and may be found at the edges of standing and slow-flowing water. The puparia are well-adapted for floating with their elongated and upturned last abdominal segment.

Altogether five species are known to occur in the Nearctic and Palaearctic regions, and two of them are found in the British Isles.

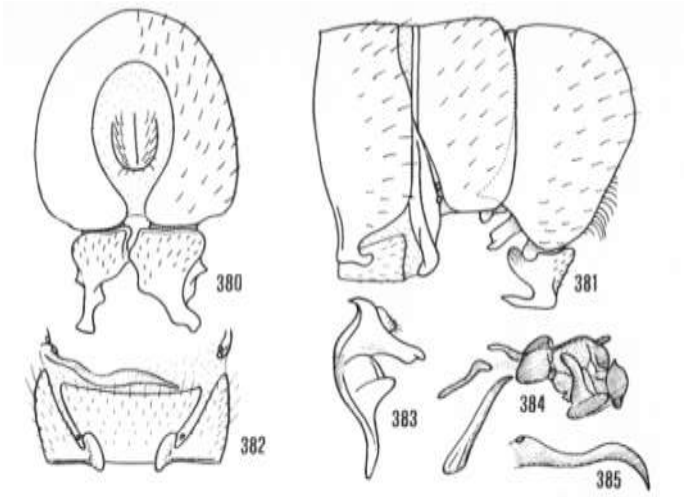
Elgiva cucularia (Linné, 1767)

Musca cucularia Linné. 1767: 995.

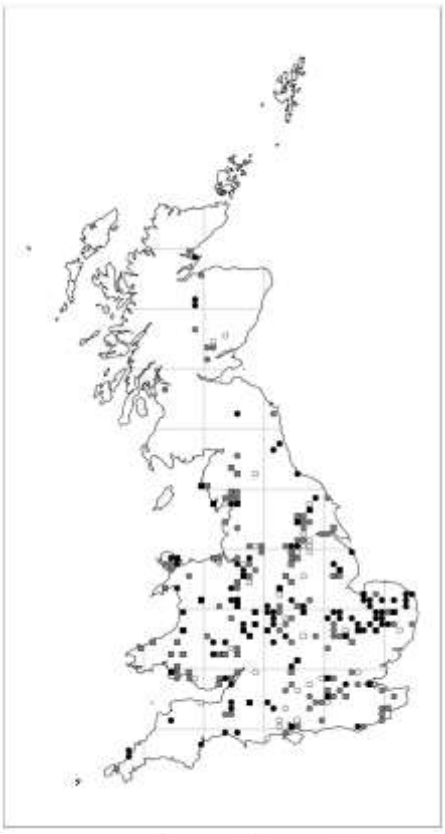
Description: A yellowish-brown species with a contrasting bluish-grey thorax. Head with a black median occipital spot, and similar black spots also present around bases of anterior orbital setae and between antennae and eye-margin on each side. Mesonotum with 4 brownish longitudinal stripes, the median pair narrow and the lateral pair broad. Mesopleuron with a round brown spot and at least 1 strong seta in addition to many hairs. Prosternum bare. Ventral setae absent on fore femora but well-developed on hind femora. Legs and abdomen yellow. Wings yellowish infuscated in anterior half, with diffuse brown spots located at anterior cross-vein, at both or upper end of posterior cross-vein and at apex of wing. Male genitalia: gonostyli distinctly asymmetrical, each with a strongly curved and pointed apical part. Sternum 5 relatively broad, ventral corners of tergum 5 dilated. Ventral process of sternum 6 long and slender, curved and pointed apically. Length: body 6.2-8.0 mm, wing 5.2-6.8 mm.

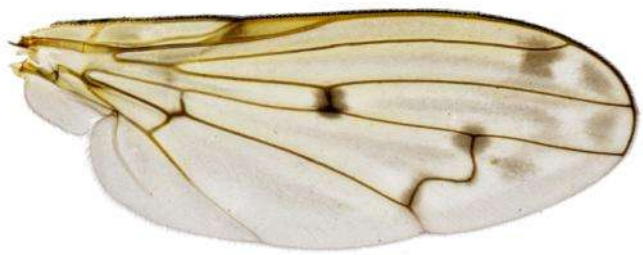
Distribution: Palaearctic: in Europe from Scandinavia south to the Mediterranean, Ireland eastwards to Greece and European Russia; North Africa (map: Knutson & Berg, 1964). Beside ponds and ditches and wetland habitats throughout Britain. Recorded from 30 hectads before 1980 and 227 hectads since.

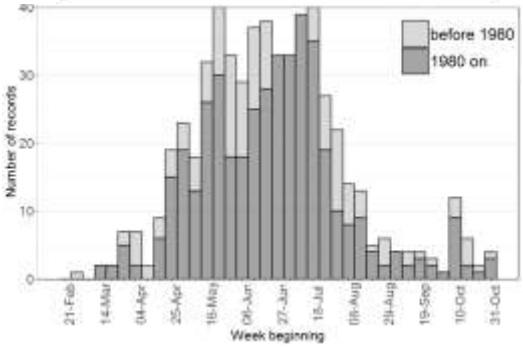
Biology: Adults occur in a wide range of freshwater situations, and are especially frequent in marshes and smaller pools. The larvae live as predators of aquatic pulmonate snails of the families Lymnaeidae, Physidae and Planorbidae which it hunts at the surface film of standing water. The duration of the three larval instars was 12-21 days in the laboratory, and the pupal period was 11-23 days. The puparium is formed away from the host. Breeding takes place continuously during the season so that the generations overlap and larvae, pupae and adults may be collected on the same day. Can over-winter in the adult stage. All the immature stages were described by Knutson & Berg (1964), and the puparium was also illustrated by Rozkošný (1967). The flight period extends from April to September, with some early records consistent with over-wintering adults.



Figs. 380-391. Male genitalia of *Elgiva* spp. – 380-385: *E. cucularia* (L.); 386-391: *E. divisa* (Loew). – 380 & 386: andrium in caudal view; 381 & 388: male postabdomen in lateral view; 382 & 389: sterna 5 and 6 in ventral view; 383 & 390: hypandrium and postgonite; 384 & 391: apodemes and aedeagus; 385 & 387: 6th sternum in one plane.







Elgiva solicita (Harris, 1780)

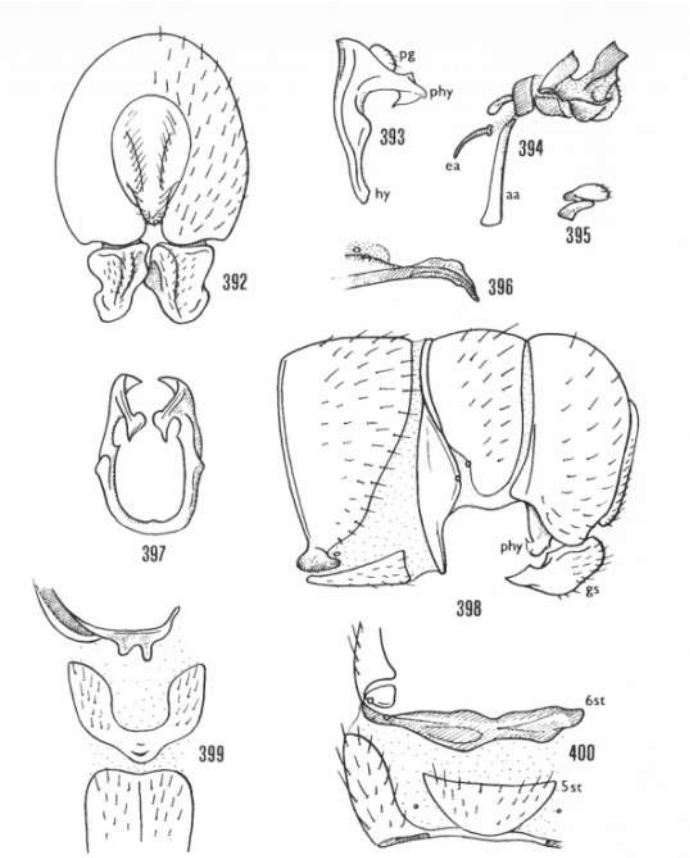
Musca solicita Harris, 1780: 116.
Musca rufa Panzer, 1798: 17 (preocc. by *Musca rufa* Scopoli, 1763).
Elgiva sundewalli Kloet 8: Hincks, 1945: 391 (as *sundewalli* Fries - not published).

Description: Ground-colour reddish-brown. The usual dark brown spots on the head distinct, the large median occipital spot bordered by whitish pruinosity, spots around anterior orbital setae relatively small and spots between antennae and eyes also whitish pruinose. Frons along eye-margin with only very narrow whitish pruinose stripes. Third antennal segment partly darkened at apex, arista only very short pubescent in apical half. Four dark longitudinal stripes on mesonotum of about the same width. Prosternum bare, mesopleuron only haired, without any strong seta. Pleura whitish pruinose, legs yellow. Ventral setae on fore femora well-developed in apical third. Wings with an infuscated area at tip in addition to some isolated spots at cross-veins. Abdomen yellowish-brown. Male gonostyli slightly asymmetrical, distinctly pointed in lateral view. Sternum 5 relatively broad, ventral corners of tergum 5 dilated as in *E. cucularia.* Ventral process of sternum 6 rather long, with a narrow ridge. Posterior process of hypandrium with a spine-like tip. Length: body 6.5-8.8 mm, wing 5.4-6.9 mm.

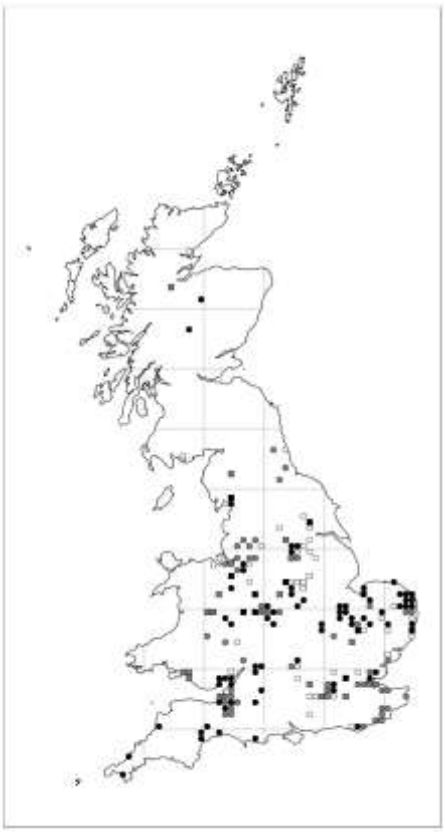
Distribution: Holarctic: in Europe from Lapland south to Spain and the Mediterranean, Ireland eastwards through most of Europe to the Ukraine and on through arctic Russia into eastern Siberia; northern

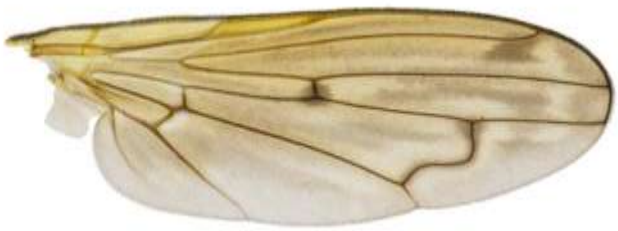
Mediterranean basin to Algeria; in North America from Alaska south to Nevada (map: Knutson & Berg, 1964). Beside ponds and ditches and wetland habitats throughout England and Wales, scarce further north. Recorded from 39 hectads before 1980 and 151 hectads since.

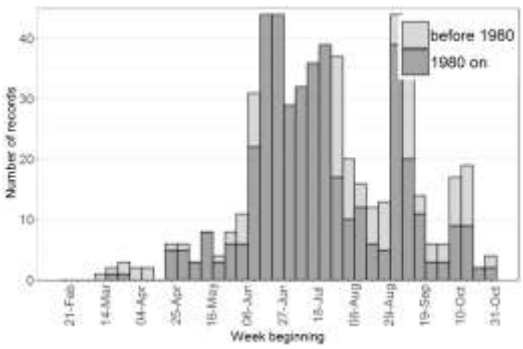
Biology: In a wide range of open, freshwater situations. The larvae float at the surface film of standing water where they prey on a wide range of aquatic gastropods (Lymnaeidae, Physidae, Planorbidae). The puparium is formed in the water and is highly modified to float there. The total length of the larval life is usually 10-12 days, and the pupal stage usually lasts 7 days. The species overwinters in the adult stage. In the laboratory, one larva consumed 12-18 planorbid snails the largest one being 14 mm in diameter. All the immature stages were described by Knutson & Berg (1964), and some illustrations were given in (Rozkošný, 1967). The flight period extends from April to October.



Figs. 392-400. Male genitalia of *Elgiva solicita* (Harr.) and *Euthycera* spp. – 392-398: *Elgiva solicita* (Harr.). – 392: andrium in caudal view; 393: hypandrium and postgonite; 394: apodemes and aedeagus; 395: postgonite; 396: 6th sternum in one plane; 397: hypandrium in ventral view; 398: postabdomen in lateral view. – 399, 400: sterna 5 and 6 in ventral view of *Euthycera fumigata* (Scop.) and *E. chaerophylli* (Fabr.). For abbreviations see p. 26.







Genus *Euthycera* Latreille, 1829: 529.

Type-species: *Musca chaerophylli* Fabricius, 1798 (subseq. des. by Cresson, 1920: 73).
Lunigera Hendel, 1900: 344.
Type-species: *Musca chaerophylli* Fabricius, 1798 (mon.).

Medium sized flies with bare upper pleura and a characteristic reticulate pattern on wings. Two orbital setae, usually with a velvety black spot around or at base of the anterior one. Mid-frontal stripe band-shaped and mainly shining, reaching anterior margin of frons or almost so. Lunula broad and shining. Second antennal segment as long as or longer than the third, antennal arista either long blackish plumose or with short whitish pubescence. Chaetotaxy of thorax virtually the same as in species of *Tetanocera*, i.e. all dorsal setae completely developed but prosternum, meso- and pteropleuron entirely bare, subalar setae absent, and inner posterior margin of hind coxae without hairs. On the other hand, only one dorsal preapical seta is present on hind tibia. Males with dense rows of ventral setae on hind femora, these setae absent in females. Wing pattern variable in individual species, irregularly reticulate or consisting of numerous, more or less rounded pale spots on a brownish background. Male genitalia with simply pointed and rather short gonostyli. Periandrium not fused below cerci. Sternum 7 usually small and isolated, hypandrium conspicuously asymmetrical.

The biology of *Euthycera* species has not been studied in detail, but the larva of *E. chaerophylli* is clearly one of the slug-killers according to (Knutson. 1970b).

The genus appears to be restricted to the Nearctic and Palaearctic regions where some 22 (i.e. 2+20, respectively) species have been described, but a modern revision is needed.

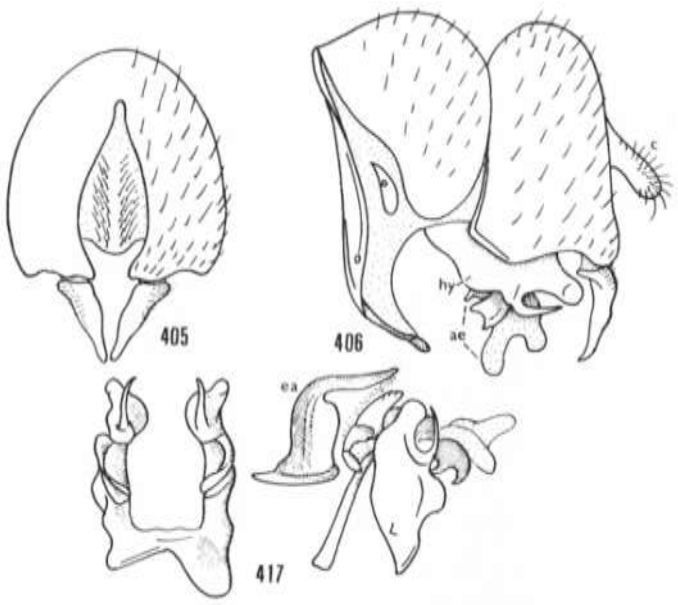
Euthycera fumigata (Scopoli, 1763)

Musca fumigata Scopoli, 17631 336.
Musca rufifrons Fabricius, 1781: 449.
Tetanocera reticulata Fallen, 1820a: 6.
Tetanocera recta Loew, 1845: 40.
Tetanocera albitarsis Gimmerthal, 1846: 104.

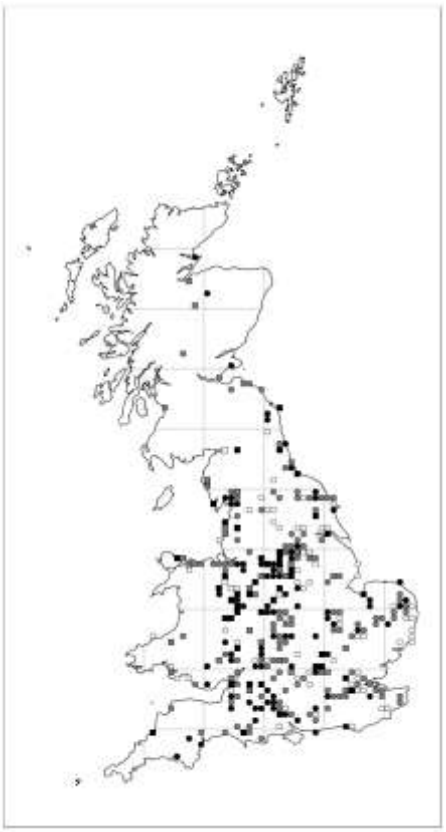
Description: Head with a dark brown occipital spot, darkened ocellar triangle, velvety black elongate-oval spot at the base of each anterior orbital seta, and a further dark spot on each side between base of antennae and eye-margin. Broad lunula shining-brown. Second antennal segment longer than the third, brown along dorsal border. Arista densely whitish pubescent, the hairs slightly longer than arista is broad at base. Mesonotum with four narrow and incomplete longitudinal stripes, scutellum with a brown median spot. Pleura brownish along upper margin, mainly yellowish pruinose on other parts. Legs yellowish, but middle and hind basitarsi or all tarsi more whitish. Wings brownish infuscated, with numerous rounded spots coalescing in basal half of central area. Abdomen with a broad median band consisting of diffuse blackish spots. Male genitalia: sternum 5 deeply emarginate; ventral part of sternum 6 short, with two small rounded projections; gonostyli slender and relatively long; hypandrium with a slender and pointed projection anterior to distal end. Length: body 6.2-8.6 mm, wing 5.5-7.0 mm.

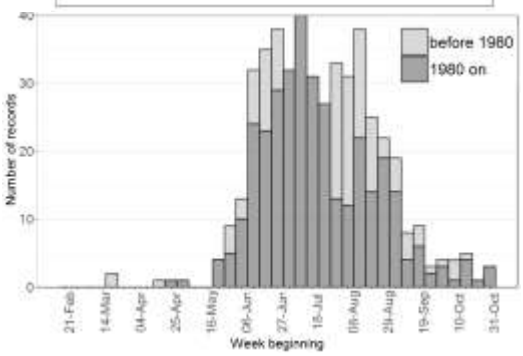
Distribution: European: extending from southern Sweden to Spain, Britain eastwards through most of Europe to Greece and European parts of Russia. England and Wales (rare in Scotland); in dry calcareous grasslands, a wide range of wetlands, wood margins and coastal habitats. Recorded from 67 hectads before 1980 and 272 hectads since.

Biology: Adults are found in dry, unimproved grassland. Immature stages unknown. The flight period extends from late May to September.



Male genitalia of *Euthycera fumigata* (Scop.). – 405: andrium in caudal view; 406: male postabdomen in lateral view; 417: hypandrium and inner copulatory organ.





Genus *Hydromya* Robineau-Desvoidy, 1830

Hydromya Robineau-Desvoidy, 1830: 69] .
Type-species: *Hydromya coeruleipennis* Robineau-Desvoidy, 1830 (= *Musca dorsalis* Fabricius, 1775) (subseq. des, by Rozkošný & Elberg, 1983).

A monotypic genus resembling species of the genus *Ilione*, especially in the venation and the isolated wing-spots. Two orbital setae, mid-frontal stripe of the usual form, ending just before anterior margin of frons. Antennae relatively short, third segment characteristically rounded at apex, hardly tapered, arista virtually bare, only microscopically haired in apical half. Dorsal thoracic setae all present, prosternum, meso- and pteropleuron entirely bare as in *Euthycera* and *Tetanocera*. Subalar setae also missing. Hind femora with a double row of ventral setae, these setae long and dense in males but only short and sparse in females. Hind tibia with one preapical seta, in an anterodorsal position, inner posterior margin of hind coxae bare. Wings with a biangulate posterior cross-vein, darkened costal border and 5 rounded isolated spots. Male genitalia: sternum 4 with two anteriorly-directed cylindrical processes that are unique in the whole of the family; sternum 5 narrow and transverse; sternum 6 with a simple and slender ventral process; small ventral sclerite distinct; gonostyli large and exposed, partly resembling those of *Dictya*.

The biology of the single species was studied by Knutson & Berg (1963), who also described all the immature stages. The mature larvae are predators of aquatic snails, but the earlier instars often display

many parasitoid habits. The larvae seem to prefer slow-flowing water. Only one species, which is widely distributed in the Palaearctic region.

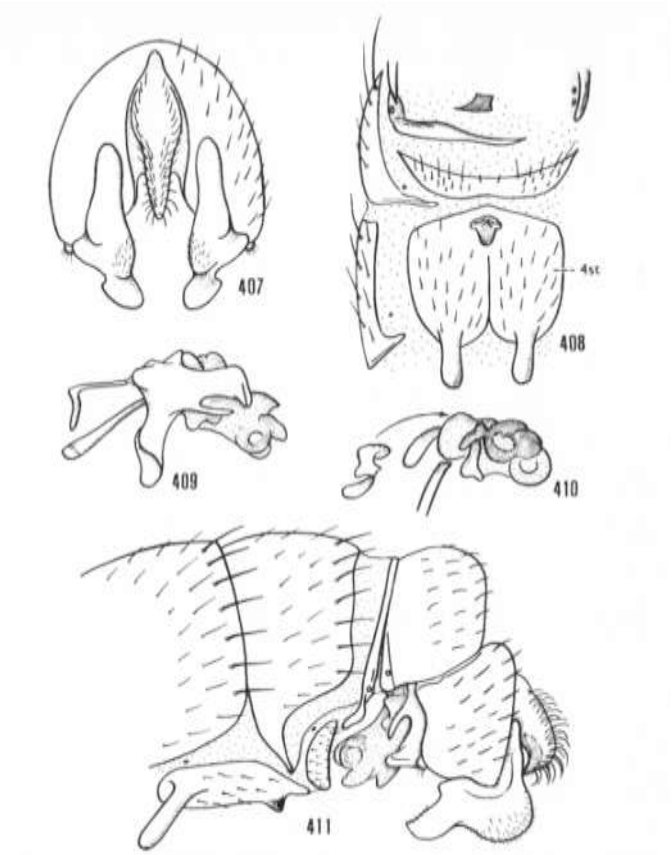
Hydromya dorsalis (Fabricius, 1775).

Musca dorsalis Fabricius, 1775: 786.
Tetanocera punctipennis Fallen, 1820a: 10.
Hydromya coeruleipennis Robineau-Desvoidy, 1830: 691.

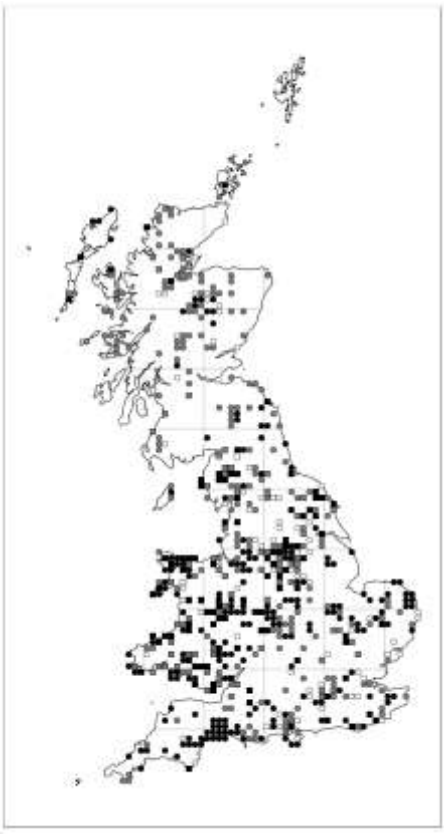
Description: Ground-colour yellowish-brown, but the greater part of mesonotum bluish-grey with two brown longitudinal stripes. Frons yellowish, mid-frontal stripe darker and shining. Third antennal segment rounded apically, arista almost bare. Most of pleura whitish pruinose, legs entirely yellow. Wings hyaline or slightly greyish infuscated, costal border brownish, four rounded spots on vein M_{1+2} and a fifth at base of the biangulate posterior cross-vein. The main structures of the male genitalia were mentioned in the generic diagnosis; the shape of the cerci (with a common and incurved tip) and hypandrium (with a long and bifid posterior process) is also characteristic. Length: body 5.6-6.8 mm, wing 5.2-6.0 mm.

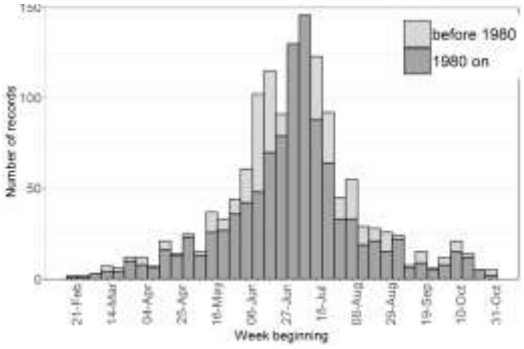
Distribution: Palaearctic: more or less throughout Europe; through Siberia to the Pacific, Kuril Islands and Japan; Mongolia (map: Knutson & Berg, 1963). Common throughout Britain in many types of wetland habitats. Recorded from 69 hectads before 1980 and 559 hectads since.

Biology: Occurs in a wide range of freshwater situations, but it is particularly frequent alongside shallow, slowly flowing water. All the immature stages were described by Knutson & Berg (1963). In nature the larvae were observed to feed upon the aquatic snails *Lymnaea truncatula* and *Planorbis planorbis*, but in the laboratory they were able to complete their development on other species of Lymnaeidae and also fed on egg masses of *Lymnaea* spp. The larvae were originally considered to be aquatic predators (Knutson & Berg, 1963), but the earlier larval instars in particular can also live in decaying dead snails for a rather long time. It cannot be ruled out that the mode of life is predominantly parasitoid, especially in young larvae. The length of the larval stage was 19-26 days and that of the pupal period 15-18 days. The puparium is formed away from the host. About five generations may be produced in a year, and overwintering takes place mainly in the larval stage. The flight period is long and a few very early records suggest that it may be able to over-winter in the adult stage.



Figs. 407-411. *Hydromya dorsalis* (Fabr.). – 407: andrium in caudal view; 408: sterna 4-6 in ventral view; 409: inner copulatory organ; 410: postgonite and aedeagus; 411: male postabdomen in lateral view.





Genus *Ilione* Haliday in Curtis, 1837

Ilione Haliday in (Curtis, 1837: 280.
Type-species: *Chione communis* Robineau-Desvoidy, 1830 (= *Musca albiseta* Scopoli, 1763) (subseq. des. by Thompson & Mathis, 1980: 84).
Knutsonia Verbeke, 1964b: 3.
Type-species: *Musca albiseta* Scopoli, 1763 (subseq. des. by Knutson & Berg, 1967: 3).

A very distinct genus with mainly haired pleura and an S-shaped posterior cross-vein though not as strongly sinuous as in *Elgiva* spp. Two orbital setae, mid-frontal stripe band-shaped and shining. Lunula covered or a little exposed, distinct only in middle. Second antennal segment as long as the third or almost so, third segment markedly tapered towards apex. Arista whitish pubescent in North European species. Mesonotum characteristically striped, all dorsal thoracic setae well-developed, only prescutellar setae sometimes absent. Prosternum bare or haired, meso- and pteropleuron haired, subalar setae present though sometimes only weak. Inner posterior margin of hind coxae distinctly haired or even with setae, hind femora with dense rows of ventral setae in males but these setae reduced or entirely absent in females. Only one preapical seta on hind tibia, in an anterodorsal position. Wings with an S-curved posterior cross-

vein, infuscated along cross-veins and with some isolated rounded spots or with darkened longitudinal streaks between veins. Male genitalia with mainly long and sometimes even swollen cerci. Sternum 5 usually narrow and transverse, ventral sclerite present, hypandrium slightly asymmetrical, ejaculatory apodeme relatively small. Female spermathecae usually spherical, but cylindrically elongated in *I. lineata*.

The biology and immature stages were studied by Knutson & Berg (1967). The known larvae live as aquatic predators of snails, and the larvae of *I. lineata* (Fall) are specialised for feeding upon freshwater pea mussels of the family Sphaeriidae.

The genus is restricted to the Palaearctic region, where 8 species are known to occur. Two have been found in the British Isles.

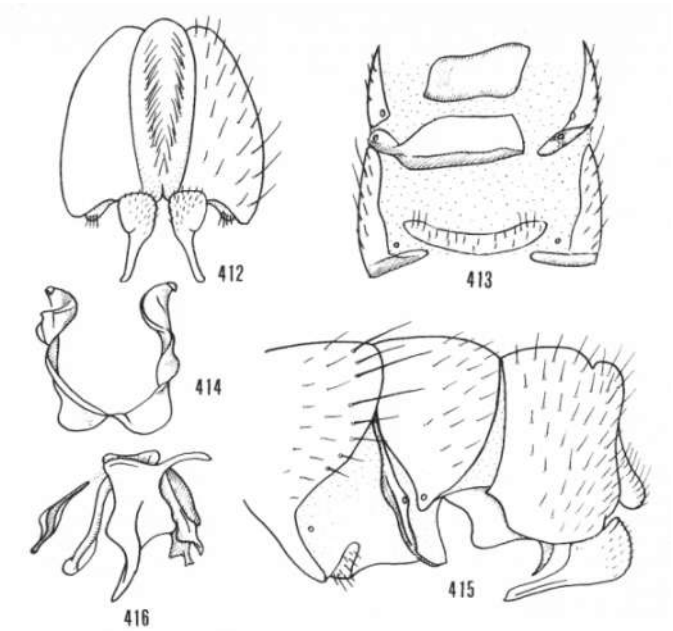
Ilione albiseta (Scopoli, 1763)

Musca albiseta Scopoli, 1763: 341.
Musca crocus Harris, 1780: 118.
Musca aratoria Fabricius, 1794: 344.
Tetanocera interstincta Fallén, 1820a: 10.

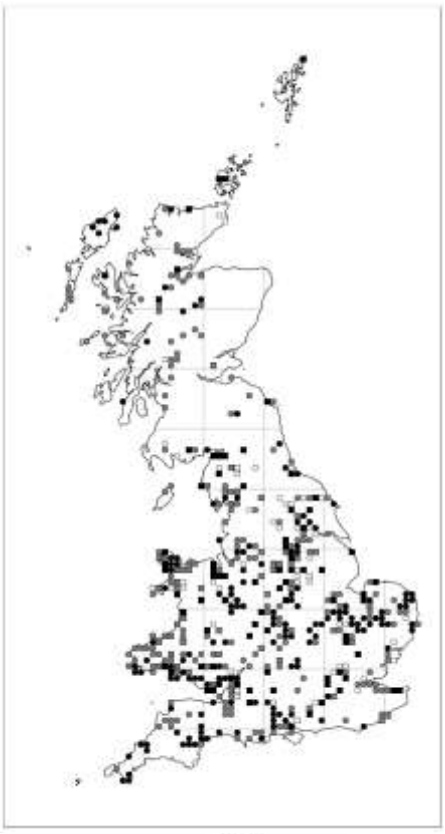
Description: Ground-colour yellowish-brown; occipital spot, rounded spots at bases of anterior orbital setae, and subtriangular spots on eye-margin at level of antennae velvety dark brown. Antennae long, second antennal segment about as long as the third, the latter markedly tapered towards apex. Arista whitish pubescent, but thickened and almost bare in basal third. Mesonotum densely yellowish pruinose, with 2 narrow median and 2 broad lateral brown longitudinal stripes, brown subnotopleural band present. Prescutellar setae strong, prosternum bare, 2-3 subalar setae well-developed. Legs yellow, only the last 2-3 tarsal segments darkened. Ventral setae on hind femora very dense and strong in males but only sparse and short in females. Wings with 5 rounded spots or at least with two rounded spots on M vein and with infuscated cross-veins. Male cerci not swollen and exposed, ventral part of sternum 6 broad, gonostyli markedly tapered in apical part, posterior process of hypandrium narrow and long. Length: body 8.0-11.2 mm, wing 6.8-8.0 mm.

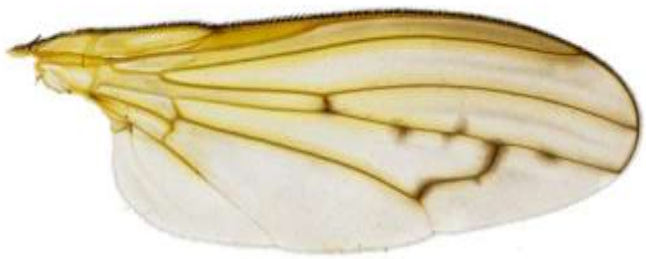
Distribution: Eurasian: more or less throughout Europe; from European parts of Russia eastwards through Siberia; around the Mediterranean basin to Turkey, Israel and North Africa; Iran, Mongolia (map: Knutson & Berg, 1967). Very common in wetland habitats throughout Britain. Recorded from 54 hectads before 1980 and 465 hectads since.

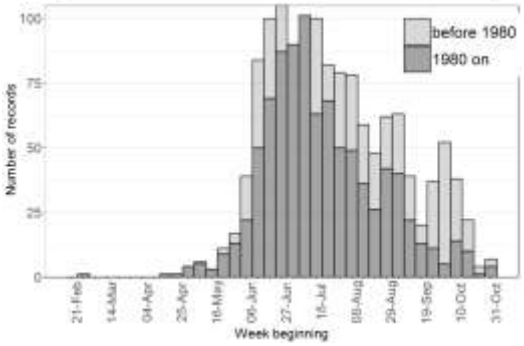
Biology: Adults occur around permanent and temporary standing water and seem to prefer habitats with *Phragmites* at lake margins. Larvae and puparia have been found among emergent aquatic vegetation. Also in wet woodland. In the laboratory, eggs were laid on grass and their hatching was apparently stimulated by contact with water. The larvae live as typical aquatic predators of pulmonate snails and are able to spend long periods completely submerged. The species overwinters in the larval stage and floating puparia have been collected only in spring. The duration of the larval stage was 31-38 days, and of the pupal period 12-42 days. The immature stages were described by Knutson & Berg (1967) and Rozkošný (1967). Univoltine. The flight period extends from May to October.



Figs. 412-417. Male genitalia of *Ilione* 412-416. *I. albiseta* (Scop.);
412: andrium in caudal view; 413: sterna 5 and 6 in ventral view; 414: hypandrium in ventral view; 415: male postabdomen in lateral view; 416: inner copulatory organ;



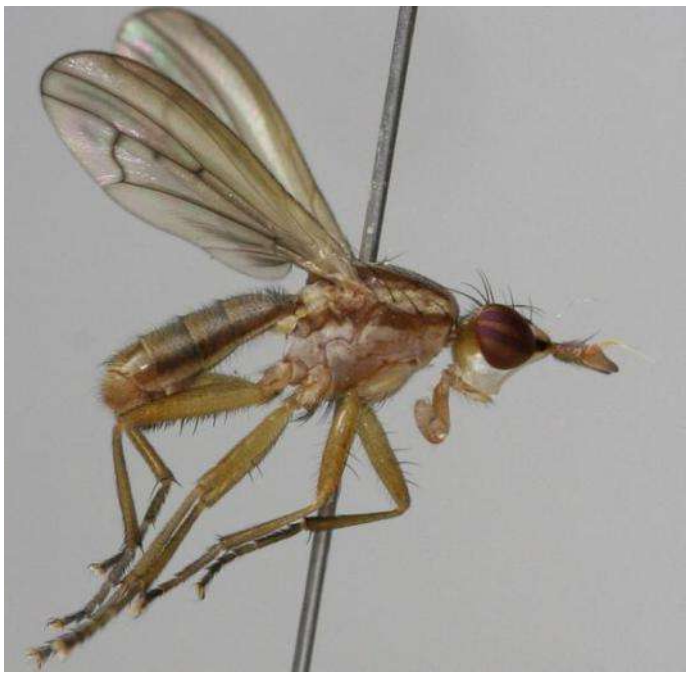




Ilione lineata (Fallén, 1820)

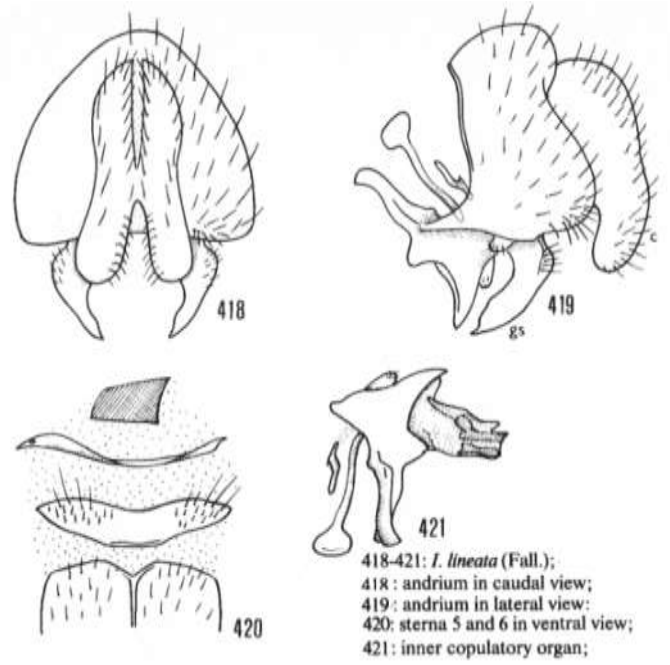
Tetanocera lineata Fallén, 1820a: 11.

Description: Ground-colour yellowish-brown. Spots on head as in *I. albiseta* but mainly velvety black. Shape of antennae also very similar, but third antennal segment shorter and narrower in distal half. Mesonotum with the usual longitudinal brown stripes, but the space between median and lateral stripe on each side bluish-grey and whitish pollinose. Prescutellar setae weak but distinct, prosternum haired, 1-2 subalar setae present. Legs mainly yellow, tarsi darkened apically. Ventral setae on hind femora well developed in males but absent in females. Wings usually without isolated spots, at most with a spot on M-vein between both cross-veins, darkened cross-veins and longitudinal streaks between veins and along them. Male cerci markedly elongated and swollen, ventral part of sternum 6 only narrow, gonostyli simple and with a short tip, posterior process of hypandrium short and pointed, and aedeagal apodeme dilated apically. Length: body 4.8-7.8 mm, wing 4.2-6.4 mm.

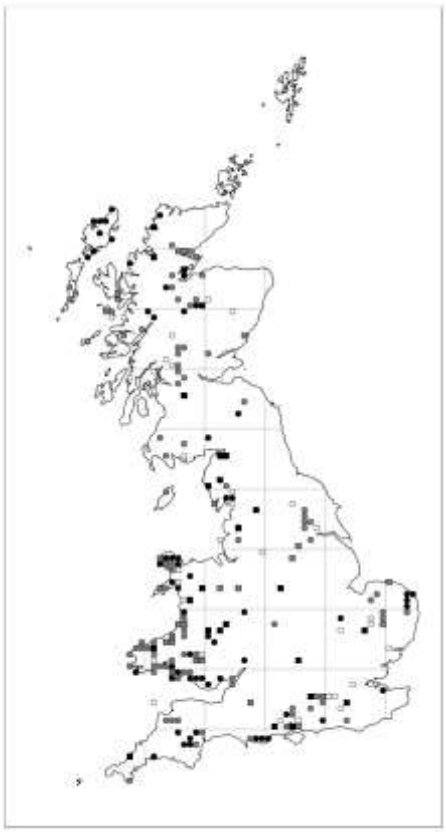


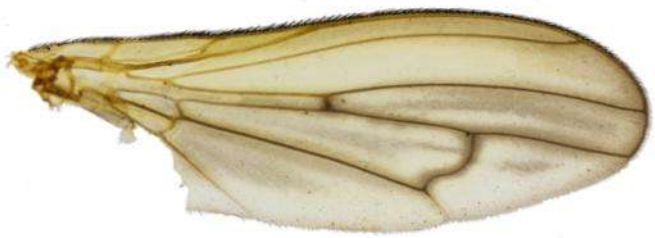
Distribution: Eurasian: northern and Atlantic zones of Europe south to northern France; eastwards through northern and central Europe to Italy; Russia to eastern Siberia (map: Knutson & Berg, 1967). Frequent in wetland habitats throughout Britain. Recorded from 32 hectads before 1980 and 195 hectads since.

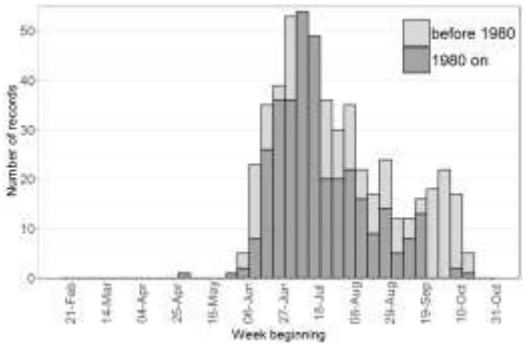
Biology: Frequent in bogs in Britain but has also been collected in woodlands in Ireland, clearly preferring acid soils (Chandler, 1972). The host's habitat requires that there is a slow flowing film of water. Eggs will apparently not hatch until they have been immersed in water for some days. The larvae are aquatic predators of Sphaeriidae (pea mussels, finger-nail clams). Young larvae search for and consume their prey underwater, but older larvae return to the surface film to replenish their oxygen supply. Each larva may kill 20-30 mature pea mussels during its development, which lasts 5-7 weeks. The species has been reared on *Pisidium castertanum*, *P. milium*, *P. obtusale* and *P. subtruncatum*. The puparium is formed in the water and has been found in the field floating in standing water. Eggs, the young larva and the puparium were described by Knutson & Berg (1967). There is probably only one generation a year. The flight period extends from May to mid October.



418-421: *I. lineata* (Fall.);
418 : andrium in caudal view;
419 : andrium in lateral view:
420: sterna 5 and 6 in ventral view;
421 : inner copulatory organ;







Genus *Limnia* Robineau-Desvoidy, 1830

Limnia Robineau-Desvoidy, 1830: 684.
Type-species: *Limnia limbata* Robineau-Desvoidy, 1830 (= *Musca unguicornis* Scopoli, 1763) (subseq. des. by Cresson, 1920: 75).

Medium-sized, mostly yellowish-brown flies with conspicuous bluish-grey and brown stripes on mesonotum and with finely reticulate wings. Always two orbital setae present; distinct dark spots around base of anterior orbital seta and between antenna and eye-margin on each side, in addition to the usual occipital spot. All dorsal thoracic setae completely developed. Prosternum haired in European species, meso- and pteropleuron haired but without distinct setae, subalar setae present. Setae on legs in the usual position, i.e. only one preapical seta on hind tibia, in an anterodorsal position. Inner posterior margin of hind coxae distinctly haired. Ventral setae on hind femora dense and long in males, entirely absent in females. Wings with a brownish reticulate pattern and darkened costal border, the reticulation usually reduced in middle of basal half. Posterior cross-vein arcuate, at most slightly S-curved. In the male genitalia, distinguishing characters have been found in the shape and pilosity of sterna 4 and 5, the form of the ventral part of sternum 6, and the form of gonostyli and hypandrium, especially the outline of its ventral margin.

No *Limnia* species has been reared through a complete life cycle, though some of the biological information available suggests that they are predators or saprophages of *Succinea*.

Only two *Limnia* occur in Europe, both occur in the British Isles. *L. unguicornis* is generally more abundant and occurs in a wider range of habitats than *L. paludicola* which tends to be found in wetter parts of sites. It is not unusual for the two species to occur together on a site. However, the two species are readily confused especially in the male and separation using some of the older keys was tricky. It is therefore probable that the species level data is not particularly reliable.

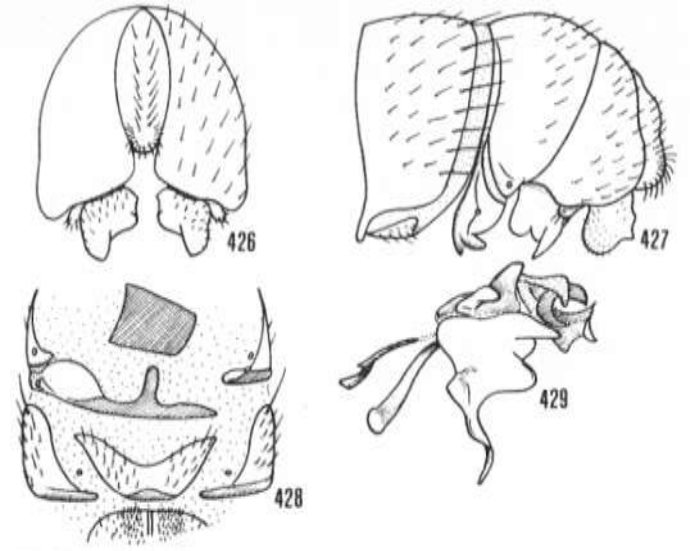
Limnia paludicola Elberg, 1965

Limnia paludicola Elberg, 1965: 195.

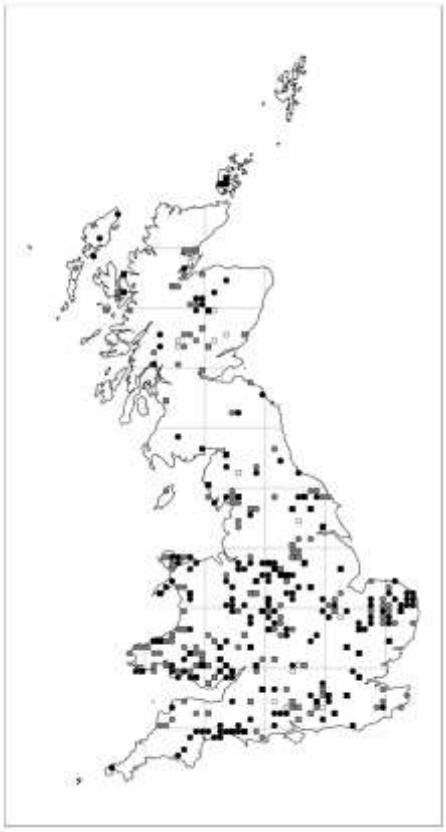
Description: Very similar to *L. unguicornis* and often confused with it in collections. Males differ only in the structure of the genitalia: sternum 5 distinctly emarginate posteriorly, ventral part of sternum 6 with a long and slender median projection, ventral outline of hypandrium without a conspicuous anterior process, and gonostyli fairly broad in lateral view. Females distinguishable by the pattern on mesonotum: median band uniformly brown, Without a pale central area. Length: body 4.2-6.2 mm, wing 3.6-5.4 mm.

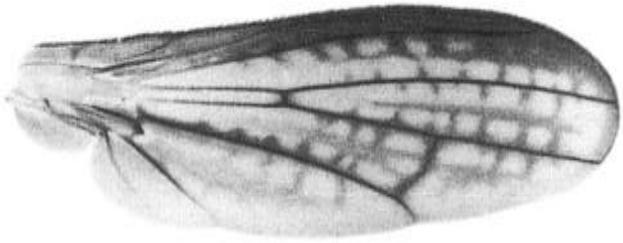
Distribution: Probably as common as *L. unguicornis*, but less well-known. Eurasian: in Europe from Scandinavia south to central France, Ireland eastwards through northern and central Europe, including the Alps (Switzerland, Italy) into European parts of Russia and throughout Siberia. Frequent in wetlands throughout Britain. Recorded from 14 hectads before 1980 and 326 hectads since.

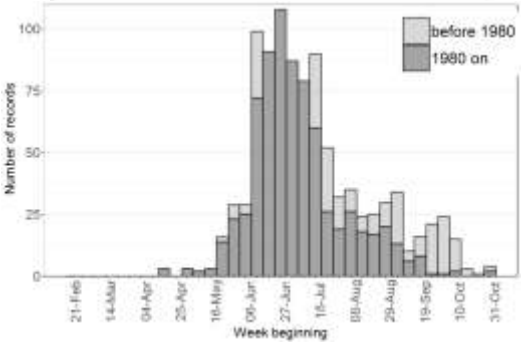
Biology: Adults are frequent at the margins of vernal pools, ponds, swamps and damp woods, and often occur sympatrically with *L. unguicornis*. Also calcareous flushes in blanket and raised bog. It has been reared to pupation using *Succinea* as the larval host. The puparium was formed away from the host. Rozkošný (1967) described the egg and young larva. Probably univoltine. Flight period from May to late September.



426-429: *L. paludicola* Elb.; 426: andrium in caudal view; 427: male postabdomen in lateral view; 428: segments 5 and 6 in ventral view; 429: inner copulatory organ.







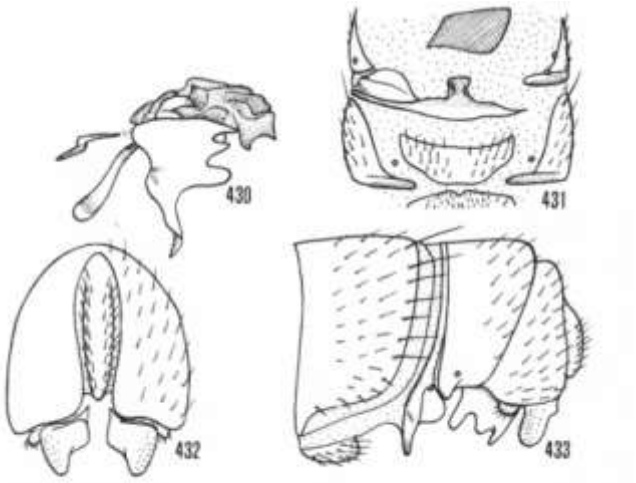
Limnia unguicornis (Scopoli, 1763)

Musca unguicornis Scopoli. 1763: 335.
Musca varicus Harris, 1780: 115.
Tabanus cylindricus Preyssler, 1791: 63.
Musca flavifrons Panzer, 1798: 60.
Tetanocera pratorum Fallén, 1820a: 6.

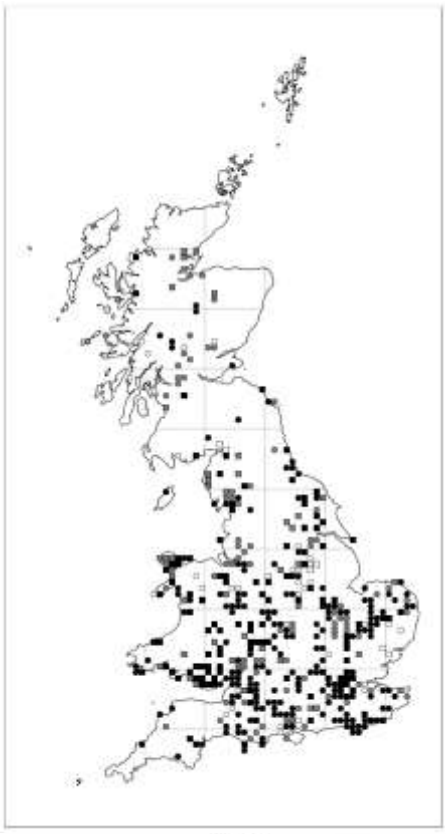
Description: Ground-colour yellowish-brown to brown, mesonotum with two bluish-grey bands and abdomen with a blackish median stripe. Third antennal segment subtriangular, pointed apically and darkened in distal part. Arista whitish pubescent. Median band on mesonotum pale in both sexes, yellowish pollinose, bordered by a brown line on each side. Male genitalia: sternum 5 hardly emarginate posteriorly, ventral process of sternum 6 with a broad and almost rectangular median projection, hypandrium with a well separated anteroventral process, and gonostyli rather slender in lateral view. Length: body 4.4-7.5 mm, wing 3.6-5.6 mm.

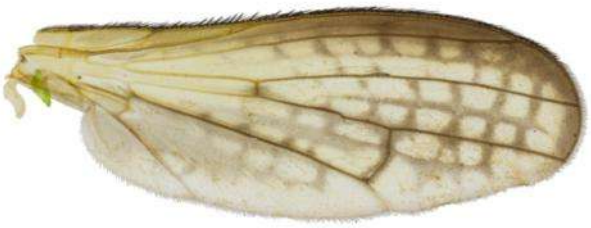
Distribution: Distribution data that predates the separation from *L. paludicola* is unreliable. Eurasian: In Europe from Lapland and the Baltic states south to the Mediterranean, Ireland eastwards through most of Europe to the European parts of Russia; Turkey to central Asia. Frequent in calcareous and neutral grassland and at margins of wetlands throughout Britain. Recorded from 39 hectads before 1980 and 419 hectads since.

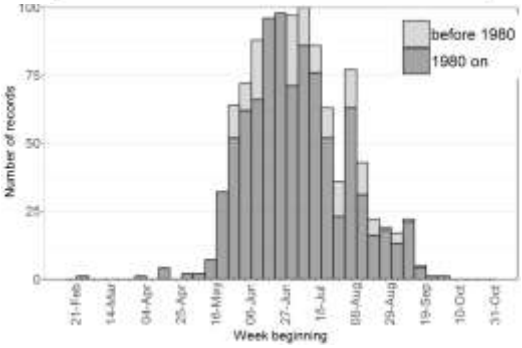
Biology: Adults are common in a wide range of open wetlands at the margins of standing water and also in damp woods. The immature stages were described by Vala & Knutson (1990). There is a prolonged pre-oviposition period of approximately 100 days. It is not clear where the eggs are laid and, in the laboratory only *Lauria* and *Succinea* were consumed. The puparium is formed away from the host and the species over-winters in the puparium. Univoltine. The flight period extends from May to September.



Figs. 430-433: *L. unguicornis* 430: inner copulatory organ. 431: segments 5 and 6 in ventral view; 432: andrium in caudal view; 433: male postabdomen in lateral view;







Genus *Pherbina* Robineau-Desvoidy, 1830

Pherbina Robineau-Desvoidy, 1830: 687.
Type-species: *Musca reticulata* Fabricius, 1781 (= *Musca coryleti* Scopoli, 1763) (sub-seq. des. by Sack, 1939: 59).

Yellowish flies with haired and setose pleura and a densely reticulate wing pattern. Always two orbital setae, mid-frontal stripe shining, ⅓ as broad as width of frons. Occipital spot mainly whitish pollinose, hardly darkened in middle. The usual dark brown spots around bases of anterior orbital setae and between base of antennae and eye-margin present. Second and third antennal segments subequal, arista with moderately long to long black hairs. Mesonotum with indistinct brownish longitudinal stripes. All dorsal thoracic setae long and strong. Prosternum bare, mesopleuron haired and with 1-3 setae at posterior margin, pteropleuron with a strong seta, subalar setae also present. Ventral setae on hind femora dense and long in males, very reduced in females. Inner posterior margin of hind coxae with hairs, only one preapical seta on hind tibia. Wings reticulate, posterior cross-vein arcuate or slightly S-shaped. Male genitalia with a narrow and transverse sternum 5 and an extensive ventral part of sternum 6, gonostyli very specific, hypandrium asymmetrical.

Species of this genus mainly occur at the edges of freshwater aquatic and semi-aquatic habitats. The main biological facts have been published for both North European species (Rozkošný, 1967; Knutson, Rozkošný

& Berg, 1975). The newly hatched larvae usually kill their first two snails rather slowly (in 24 hours) and may continue feeding in the liquefied tissues for 3 to 5 days. The second- and third-instar larvae kill their prey more quickly, but continue feeding on the dead snails for several weeks. Although the mature larvae behaved as predators in the laboratory, distinct parasitoid tendencies were evident. In nature, larvae and puparia have been found floating at the margins of standing water.

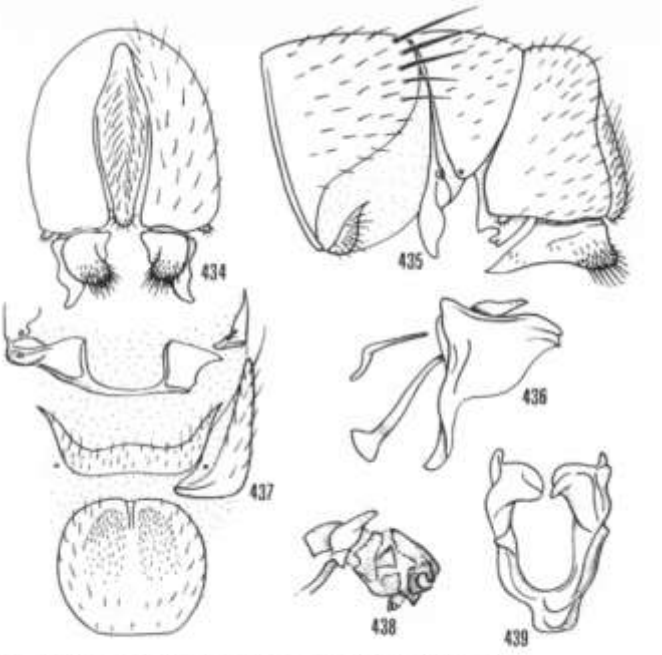
Pherbina coryleti (Scopoli, 1763)

Musca coryleti Scopoli, 1763: 336.
Musca reticulata Fabricius, 1781: 450.
Tetanocera obsoleta Fallén, 1820a: 5.

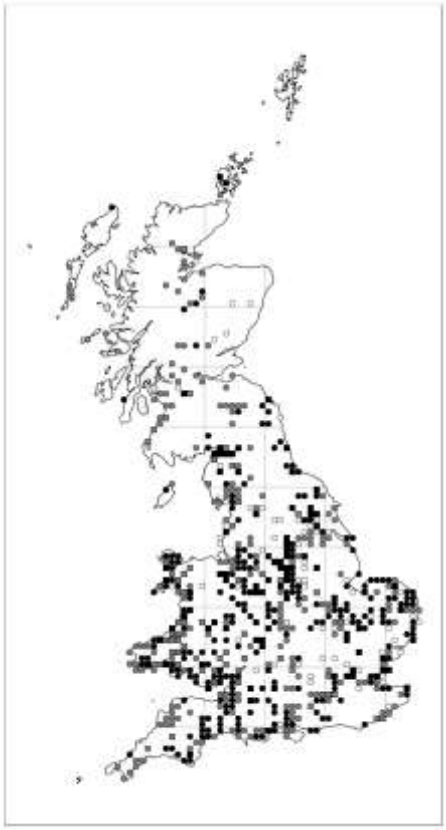
Description: Ground-colour yellowish to yellowish-grey. Second antennal segment stout, with a distinctly convex upper and lower margin. Antennal arista with long black hairs, total plumosity about ½-¾ width of antennae. Mesopleuron with hairs and three stronger setae at posterior margin, pteropleuron with one strong seta. Wings yellowish-grey infuscated with a brownish reticulate pattern, reticulation only slightly distinct in cell Cu where isolated spots predominate. Posterior cross-vein slightly S-curved. Male genitalia: gonostyli with a conspicuous tuft of black setae on posterior lobe, elongated and pointed anteriorly; sternum 4 rounded, without posterior tubercles; ventral part of sternum 6 broad and deeply emarginate in middle; aedeagal apodeme abruptly dilated at base. Length: body 6.8-9.3 mm, wing 5.8-8.0 mm.

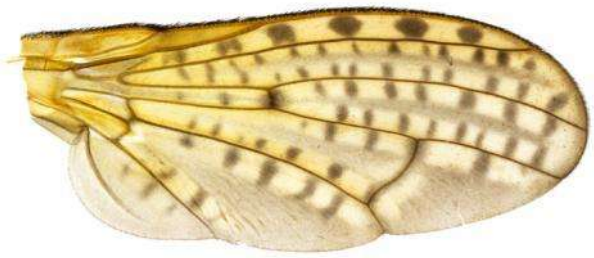
Distribution: Eurasian: in Europe, from Scandinavia south to the Mediterranean, Ireland eastwards through most of Europe into the European parts of Russia and on to Siberia, Azerbaijan, Iran and Afghanistan (map: Knutson, Rozkošný & Berg, 1975). Very common in a wide range of wetlands throughout Britain. The species for which most records have been received! Recorded from 63 hectads before 1980 and 573 hectads since.

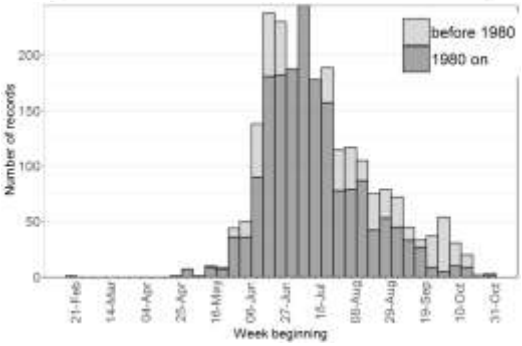
Biology: Adults are frequent along the margins of standing water of all types including coastal marshes. Eggs are laid on and amongst marginal vegetation. The larva is an aquatic predator that may be found in open water or amongst the vegetated edges of standing water, including temporary pools. In the laboratory, larvae attacked and killed a wide range of terrestrial and freshwater gastropods in greater numbers than any other species. Larvae kill snails quickly and may remain in the dead snail for an unusually long period. Univoltine, over-wintering occurs in the third larval stage. Pupation occurs away from the host and floating puparia may be found amongst marginal vegetation. Flight period from May to September.



Figs. 434-442. Male genitalia of *Pherbina* spp. – 434-439. *P. coryleti* (Scop.); Verh. – 434: andrium in caudal view; 435: male postabdomen in lateral view; 436: inner copulatory organ (without aedeagus); 437: sterna 4-6 in ventral view; 438: postgonite and aedeagus; 439: hypandrium in ventral view;







Genus *Psacadina* Enderlein, 1939

Psacadina Enderlein, 1939: 204.
Type-species: *Psacadina andalusica* Enderlein, 1939 (= *Psacadina disjecta* Enderlein, 1939) (orig. des.).
Verbekea Mayer, 1953: 203 (as subgenus of *Pherbina*).
Type-species: *Musca punctata* auct. nec Fabricius, 1794 (= *Psacadina verbekei* Rozkošný in Knutson, Rozkošný & Berg, 1975) (orig. des.).

Closely related to *Pherbina* but clearly distinguishable by some conspicuous characters. Mid-frontal stripe usually narrower, sometimes even pollinose and poorly distinct. Second antennal segment much shorter than the third, arista with long black hairs. All dorsal thoracic setae well-developed. Prosternum bare, mesopleuron haired and with one strong seta, pteropleuron only haired, without any seta, subalar setae also absent. Inner posterior margin of hind coxae haired, ventral setae on hind femora dense in males and reduced or wholly absent in females, only one preapical seta on hind tibia. Wings with numerous dark and rounded spots. Male genitalia with smooth gonostyli, very slender and transverse sternum 5, apically bifid ventral part of sternum 6, short ejaculatory apodeme, unusually long postgonites, and a broad hypandrium in proximal part.

The mature larvae live mainly as predators of aquatic snails, and some morphological characters (e.g. the very short interspiracular float-hairs) suggest that they probably live in at least semi-aquatic microhabitats.

The younger larvae may feed on decaying snail tissues for several days and show some apparent parasitoid tendencies. The complete life-cycles and immature stages of three species were studied by Knutson, Rozkošný & Berg (1975). Five species appear to be confined to the Palaearctic region. The three species that occur in Britain are very similar and are often confused in collections. Records should be based on males where the male genitalia has been examined.

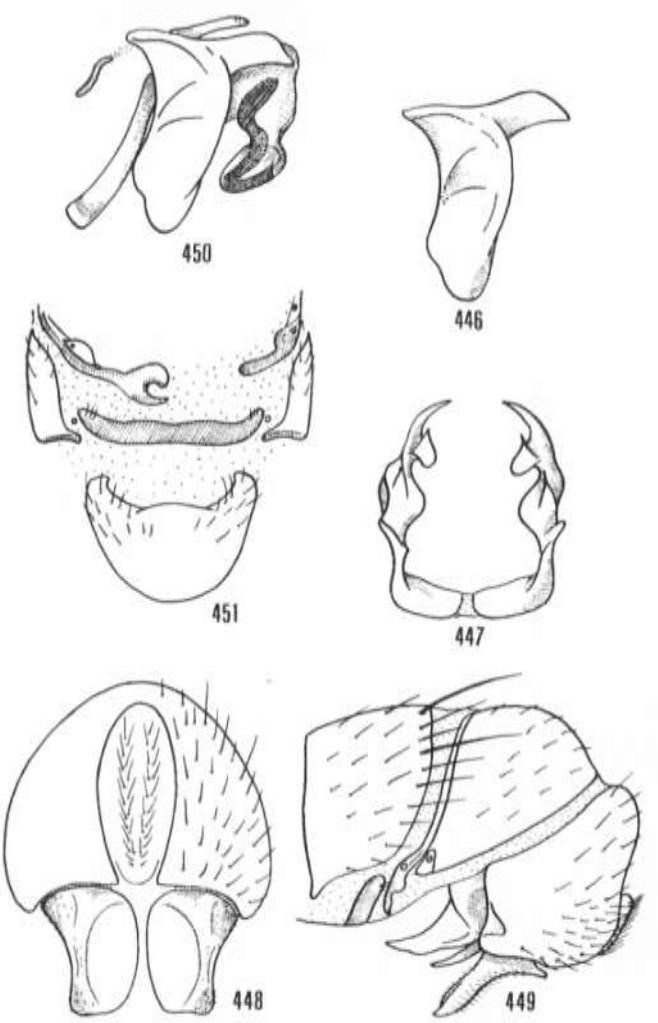
Psacadina verbekei Rozkošný in Knutson, Rozkošný & Berg, 1975

Psacadina verbekei Rozkošný in Knutson, Rozkošný & Berg, 1975: 6.
Musca punctata auct. nec Fabricius, 1794: 347.

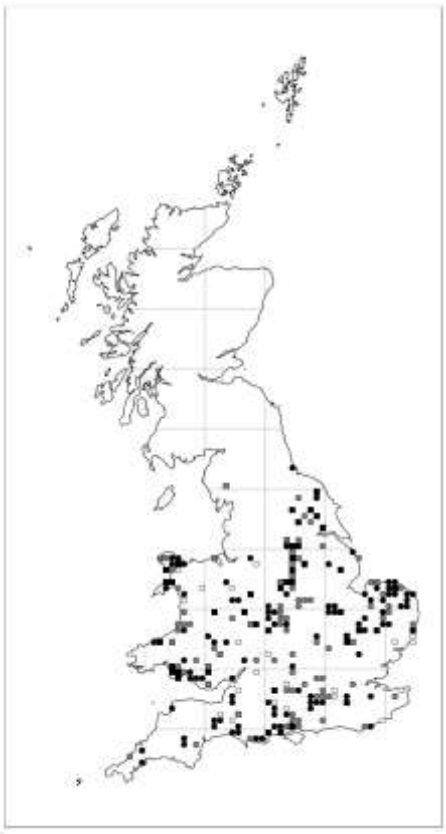
Description: Mainly yellowish to greyish-brown flies, with numerous brownish spots on wings. On average somewhat smaller than *P. zernyi*. Mid-frontal stripe slightly widened towards apex. Ventral setae on hind femora of males usually more numerous, and pubescence on hind trochanters also longer and denser. Females with 1-2 ventral setae distinct at middle of hind femora. Wings relatively shorter, with more greyish ground-infuscation and larger brown spots, these extending along vein Cu. Posterior cross-vein at most only very slightly S-curved. Male genitalia: gonostyli somewhat elongated, almost straight in lateral view; sternum 5 markedly sclerotised and narrow; ventral part of sternum 6 dilated and bifid apically; posterior process of hypandrium rather broad and simply pointed, and postgonite elongate but straight. Length: body 6.3-7.8 mm, wing 5.6-6.6 mm.

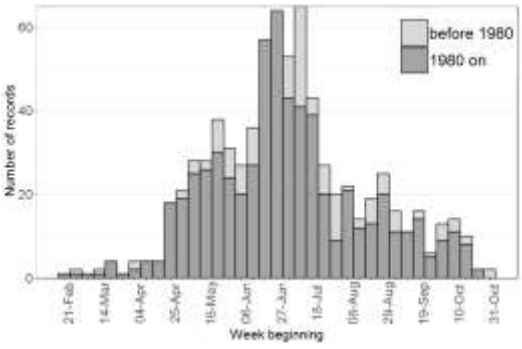
Distribution: A Eurasian species, from southern Scandinavia south to Spain, Ireland eastwards through most of Europe to Greece and the European parts of Russia; Turkey, Iran (map: Knutson, Rozkošný & Berg, 1975). Most widespread species of the genus, frequent in many wetland habitats. '**Notable**' according to Falk (1991). Recorded from 22 hectads before 1980 and 215 hectads since.

Biology: Adult are found in wetlands and wet edges of woodland and carr. All the immature stages were described by Knutson, Rozkošný & Berg (1975). In the field, larvae have been found on emergent grasses at the edge of slow-moving water and the eggs also appear to be laid in such situations. The larvae are aquatic predators inhabiting the water's edge. In the laboratory, development was completed successfully using aquatic snails of five different genera, but showing a strong preference for lymnaeids. The entire larval stage lasted 22-28 days, and the pupal period 10-17 days. Pupation occurs just under, or at the edge of water margin plant litter or in damp soil. The main flight period is from April to October, but there are some records as early as February.



Psacadina verbekei Rozk. - 448: andrium in caudal view; 449: male postabdomen in lateral view; 446: inner copulatory organ; 447: hypandrium in lateral and ventral view. 450: inner copulatory organ; 451: sterna 4-6 in ventral view;





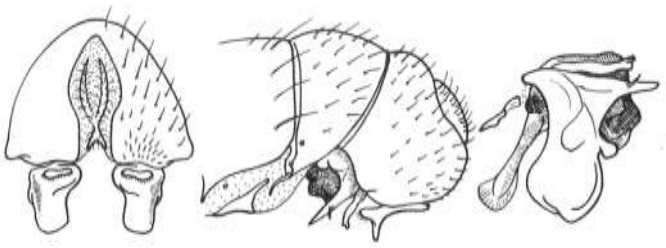
Psacadina vittigera (Schiner, 1864)

Tetanocera vittigera Schiner, 1864.

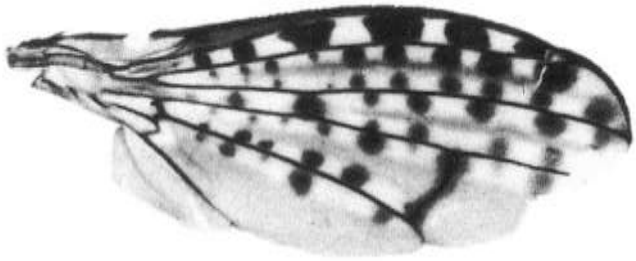
Description: A small dark species with intensely spotted wings. Mid-frontal stripe often indistinct, whitish pruinose, very narrow in males and often bordered by brownish lines in the female. Legs yellow; femora, apices of the front tibia and apical segments of the fore tarsi brownish. Brown spots on the wing membranes larger and darker than in *P. verbekei*, especially along the costal margin. Male genitalia: gonostylus with posterior lobe and subbasal, haired protuberance; sternum 5 sub-triangular, with a median tubercle on posterior margin; sternum 6 narrow only ventrally. Body length 5.5-6.8mm, wing length 4.2-5.5mm.

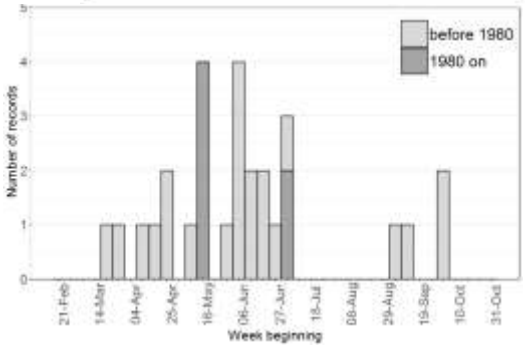
Distribution: A European species from the Baltic states south to central France, Britain eastwards through central Europe into the European parts of Russia; Hungary and Romania. A rare species in Britain principally from ancient fens, mainly in East Anglia; isolated records from South and South-West England. '**Vulnerable**' (RDB2) according to Falk (1991). Recorded from 4 hectads before 1980 and 9 hectads since.

Biology: Adults in tall fen, sedge beds and along vegetated river margins. Immature stages unknown. Flight period May to October.



P. vittigera, male postabdomen in ventral and lateral view, and inner copulatory organ





Psacadina zernyi (Mayer, 1953)

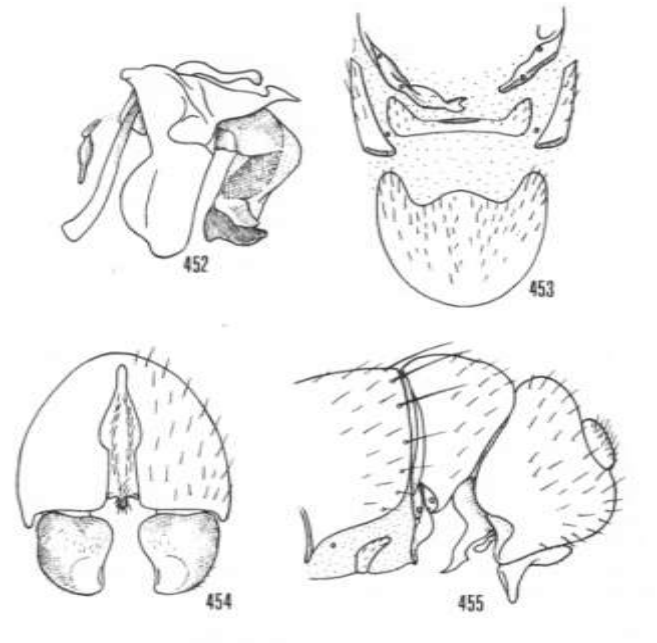
Pherbina zernyi Mayer, 1953: 204.

Description: Closely related to *verbekei*, but on average somewhat larger. Ground-colour yellowish-brown with whitish pruinosity. Mid-frontal stripe usually rather narrow, partly whitish pruinose, subshining, bordered by a brownish line. Ventral setae on hind femora of males less numerous than in *verbekei* and also pubescence on hind trochanters shorter and less dense. Females, as a rule, without any ventral setae on hind femora. Wings relatively long, their infuscation yellowish, rounded brown spots often rather small, usually weakly distinct along Cu-vein. Posterior cross-vein distinctly S-curved. Male genitalia: gonostyli short and rounded on outer side, markedly concave in lateral view; sternum 5 somewhat dilated on sides, not dark sclerotised; ventral part of sternum 6 hardly dilated before its bifid apex; hypandrium enlarged

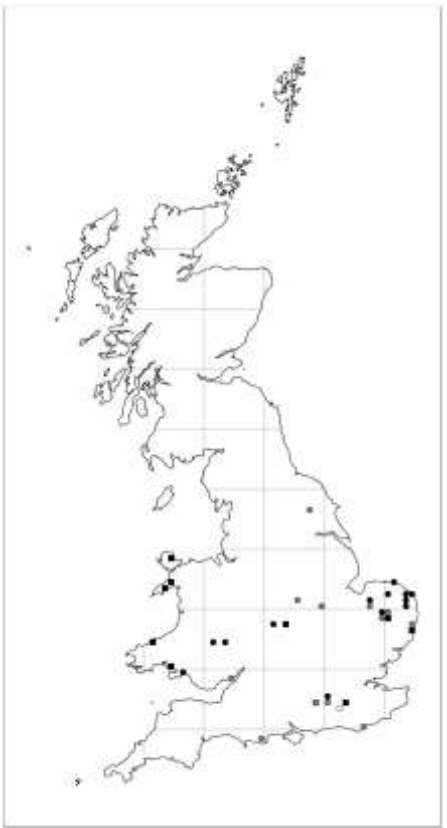
proximally, its posterior process tapered and angulate in front of tip; postgonites unusually long and distinctly curved. Length: body 6.5-8.5 mm, wing 5.8-7.0 mm.

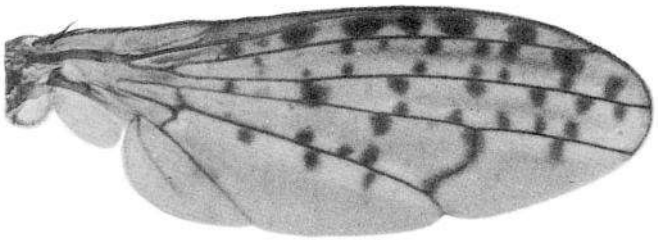
Distribution: A Eurasian species, in Europe from Scandinavia south to the Alps, Ireland eastwards through central and northern Europe into the European parts of Russia; Greece, Turkey and Iran (map: Knutson, Rozkošný & Berg. 1975). Scarce, in pingo fens in East Anglia and from mineral marshes elsewhere in Eastern England. '**Vulnerable**' (RDB2) according to Falk (1991). Recorded from 1 hectads before 1980 and 34 hectads since.

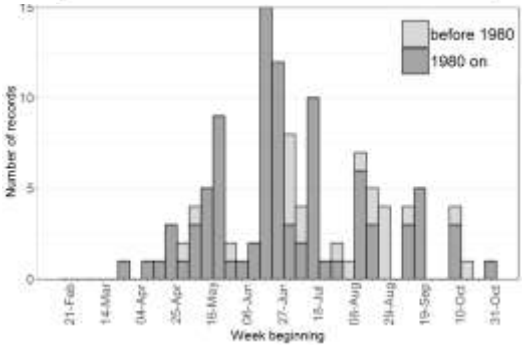
Biology: Adults in a range of wetlands, marshes and fens. All the immature stages were described by Knutson, Rozkošný & Berg (1975). The larva is a predator of various freshwater gastropods: *Aplexa hypnorum*, *Bathyomphalus contortus*, *Galba truncatula*, *Succinea* spp. which it feeds on at the water's edge. In the laboratory, one female produced up to 485 eggs (in 52 days). The larvae attacked living snails. First- and second-instar larvae were also able to eat decomposing snail tissues for the first 8 to 11 days, but mature larvae fed on one snail for a much shorter period. The entire length of the larval stage was 20-24 days, and of the pupal period 12-17 days. Puparia are formed out of the water, on or just under the surface of plant debris. The species over-winters in the puparium. Flight period from April to September.



Figs. 452-455: *P. zernyi* 452: inner copulatory organ; 453: sterna 4-6 in ventral view; 454: andrium in caudal view; 455: male postabdomen in lateral view.







Genus *Renocera* Handel, 1900

Renocera Hendel, 1900: 333.
Type-species: *Renocera stroblii* Hendel, 1900 (subseq. des. by Cresson, 1920: 51).

Related to *Tetanocera* Dum. but usually smaller. Ground-colour yellowish to brown; wings without any special pattern. One or two orbital setae, mid-frontal stripe band-shaped and shining, sometimes darkened, usually reaching anterior margin of frons or somewhat shortened. Third antennal segment mostly about three times as long as the second. Arista with black hairs, long-pubescent to long-plumose. Chaetotaxy resembling *Tetanocera*: all dorsal thoracic setae well-developed, prosternum setose or bare, meso- and pteropleuron bare, subalar setae absent. Inner posterior margin of hind coxae bare. Hind femora with 1-2 anterodorsal setae before apex, ventral setae of hind femora rather strong in both sexes or reduced in females. Always only one preapical seta on hind tibia. Wings usually slightly infuscated, with darkened cross-veins. Male genitalia rather diverse but sternum 5 always characteristic: emarginate, with posterior incision or tubercles. Gonostyli divided into anterior and posterior parts but simple in *R. stroblii*. Shape of hypandrium also very specific, pregonites absent, postgonites small and simple, ejaculatory apodeme very short.

The life cycles and larval feeding habits were studied for three North American species by Foote (1976). All the larvae studied preyed exclusively on pea mussels of the family Sphaeriidae. According to a note by Knutson (1970b), the European *R. striata* is also a mussel-killer.

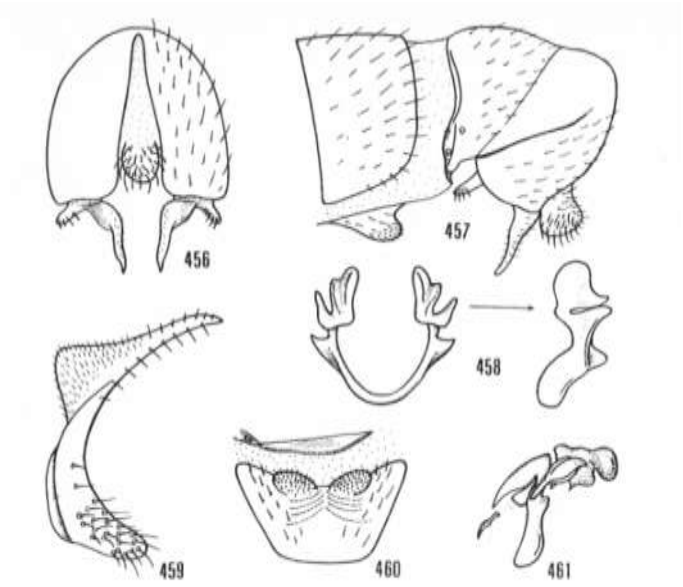
Renocera pallida (Fallén, 1820)

Sciomyza pallida Fallén, 1820a: 12.
Renocera sintenisiana Hendel, 1900: 334.

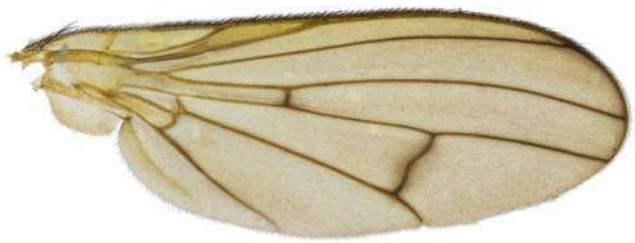
Description: Yellow to brownish, rather small flies with one orbital seta and conspicuously darkened third antennal segment. Frons yellow, mid-frontal stripe, orbital plates and a broad anterior margin of frons shining, other parts dull. Apical half of third antennal segment blackish, black aristal hairs long, plumosity about as wide as third segment. Cheek distinctly narrower than half width of eye. Mesonotum darkened, greyish pruinose, prosternum bare. Ventral setae on hind femora dense but short (only a few of them longer) and weak in males, entirely absent in females. Wings yellowish, cross-veins hardly infuscated, posterior cross-vein markedly straight. Male genitalia: sternum 5 trapezoid, with a pair of posterior tubercles; ventral part of sternum 6 simple and plain; gonostyli with well-separated anterior and posterior parts, posterior part slender and elongated; hypandrium unusually narrow in ventral view. Length: body 4.4-6.2 mm, wing 4.2-5.6 mm.

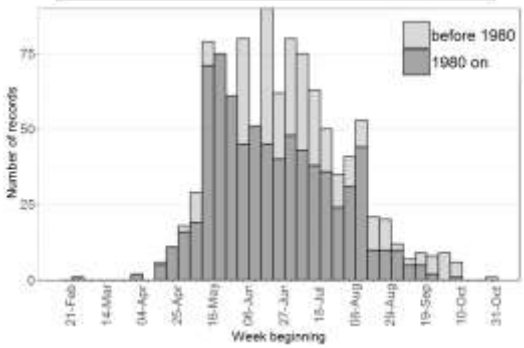
Distribution: Eurasian: in Europe from Lapland south to north east Spain, Ireland eastwards through northern and central Europe to northern Italy; Romania, the Ukraine; Russia through Siberia to the Pacific. The commonest member of the genus, widespread in Britain in wet woods and shaded margins of wetlands. Recorded from 73 hectads before 1980 and 403 hectads since.

Biology: Adults occur at water margins in a wide range of habitats including wet woodland, stream and lake margins and seasonally flooded grassland. The immature stages were described by Horsáková (2003) who reared the species through its entire life cycle. The larvae are predators of Sphaeriidae (pea mussels) in water-logged ground. Early instars attack small *Pisidium* spp., but mature larvae attack larger *Pisidium* and *Sphaerium* spp. (laboratory observations). Larvae do not usually go below the water surface, but prefer water-saturated ground where species such as *Pisidium personatum* (an amphibious species frequently found in temporary water bodies) can be found. The puparium is formed away from the host and the species over-winters in the puparium. Appears to be bivoltine. The flight period May to September.



Figs. 456-463. Male genitalia of *Renocera* spp. – 456-461: *R. pallida* (Fall.); (Meig.). – 456: andrium in caudal view. 457: male postabdomen in lateral view; 458: hypandrium in ventral and lateral view; 459: posterior and anterior part of gonostylus; 460: sternites 5 and 6 in ventral view; 461: inner copulatory organ (without hypandrium).





Renocera striata (Meigen, 1830)

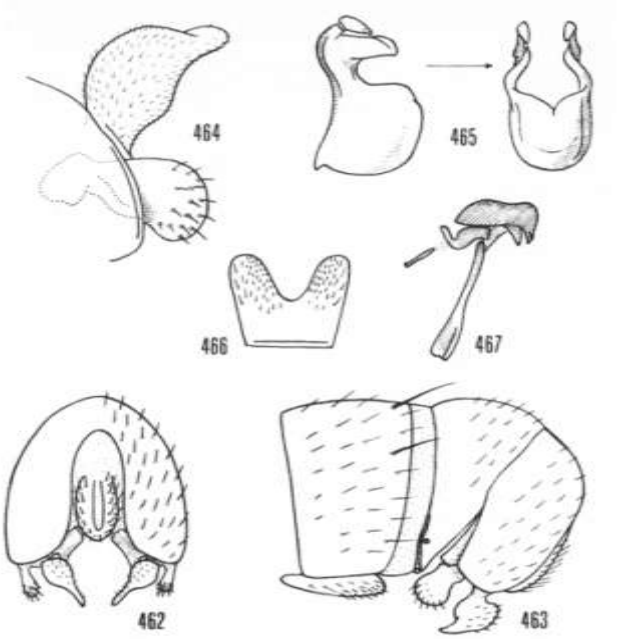
Sciomyza striata Meigen, 1830: 20.
Sciomyza affinis Zetterstedt, 1846: 2101.

Description: Head and legs mainly yellow, thorax and abdomen brownish, thorax densely whitish-grey pollinose. Two orbital setae present. Frons yellow, mid-frontal stripe subshining dark brown, lines along eye-margins whitish. Third antennal segment at most slightly brownish in apical half, black aristal hairs hardly longer than arista is broad at base. Face and cheeks whitish pruinose, cheek narrower than half width of eye. Prosternum distinctly setose. Fore legs darkened as from distal halves of tibiae, and tarsi on other legs also darkened apically. Ventral setae on hind femora dense and rather strong in males but

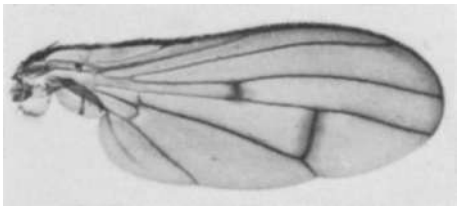
absent in females, Wings brownish infuscated, darkened along anterior margin in apical half; both cross-veins also broadly and intensively infuscated. Male genitalia: sternum 5 simple but deeply emarginate posteromedially; gonostyli consisting of anterior and posterior parts, both parts rather short and stout; hypandrium markedly swollen in proximal half. Length: body 4.2-5.4 mm, wing 4.2-5.0 mm.

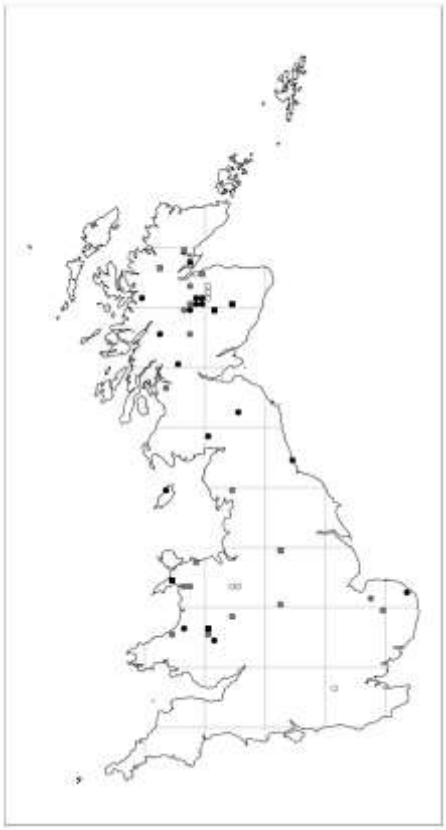
Distribution: Holarctic: in Europe from Lapland south to southern France, Ireland eastwards through northern and central Europe into European parts of Russia and on through Siberia to the Pacific. In the Nearctic, occurs in northern parts. Rare in flushed peatlands, mainly in north-western Britain. Recorded from 7 hectads before 1980 and 39 hectads since. '**Notable**' according to Falk (1991).

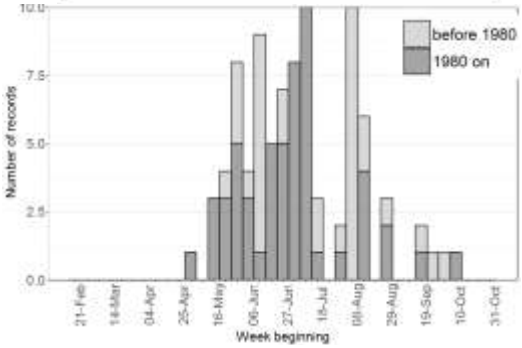
Biology: Adults occur at the margins of water in raised bog and fen and calcareous flushes in blanket bog. The immature stages were described by Foote (1976) who raised it through the complete life cycle in North America under the name of *R. brevis*, now known to be a synonym of *R. striata*. Larvae were found to feed on pea mussels: one species of *Pisidium* and three of *Sphaerium*. The first-instar larvae foraged beneath the water surface, but later instars keep their posterior spiracles at the water surface. The puparium is formed away from the host. The flight period from May to September.



Figs. 456-463. Male genitalia of *Renocera* spp. – 462 & 463 464-467: *R. striata*
462: andrium in caudal view. 463: male postabdomen in lateral view;
464: posterior and anterior part of gonostylus; 465: hypandrium in lateral and ventral view; 466: 5th sternum; 467: inner copulatory organ (without hypandrium);







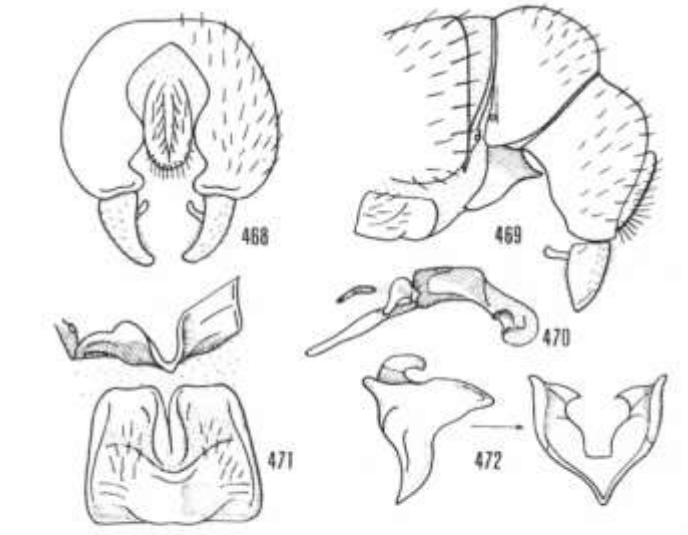
Renocera stroblii Hendel, 1900

Renocera stroblii Hendel, 1900: 333.
Sciomyza fuscinervis auct. nec Zetterstedt, 1838: 737.

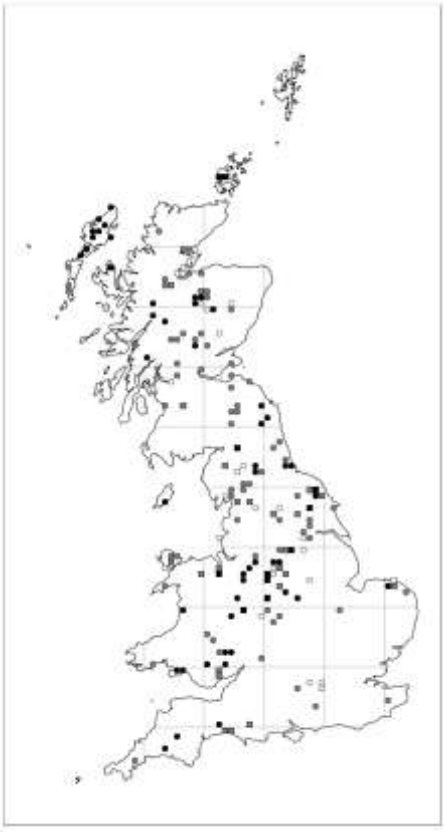
Description: Ground-colour yellowish to reddish-brown. Two orbital setae, mid-frontal stripe fairly narrow, subshining yellow. Antennae yellowish-brown, arista black, moderately long-plumose, total plumosity slightly narrower than third antennal segment. Cheeks much broader than half width of eye. Mesonotum with 4 brownish narrow longitudinal stripes. Prosternum always bare. Fore legs darkened as from tips of tibiae in females, but mainly yellow in males. Ventral setae on hind femora strong and dense in both sexes. Wings yellowish infuscated, both cross-veins darkened, posterior cross-vein distinctly arcuate. Male genitalia conspicuously swollen: sternum 5 subquadrate, with a deep posterior incision in middle; ventral part of sternum 6 broad, deeply emarginate medially; gonostyli rather small, leaf-shaped, with a slender inner process, without any anterior part; hypandrium subtriangular in ventral view. Length: body 4.6-5.3 mm, wing 4.3-4.7 mm.

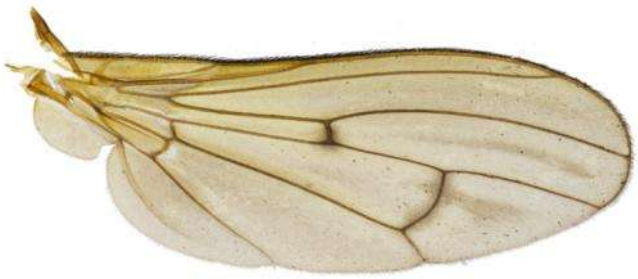
Distribution: Eurasian: in Europe, from Lapland south to southern France, Ireland eastwards through most of Europe to European parts of Russia and on through Siberia to the Pacific. Frequent in flushed peatlands, mainly in north-western Britain. Recorded from 28 hectads before 1980 and 151 hectads since.

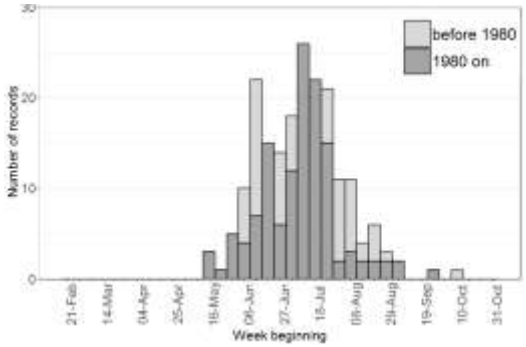
Biology: Adults occur at the margins of ponds and the backwaters of rivers, and also in marshes. Immature stages unknown. Flight period June to August.



Figs. 464-472. Male genitalia of *Renocera* spp. – 468-472: *R. stroblii* Hend. – 464: posterior and anterior part of gonostylus; 472: hypandrium in lateral and ventral view; 470: inner copulatory organ (without hypandrium); 468: andrium in caudal view; 469: male postabdomen in lateral view; 471: sterna 5 and 6 in ventral view.







Genus *Sepedon* Latreille, 1804

Sepedon Latreille, 1804: 196.
Type-species: *Syrphus sphegeus* Fabricius, 1775: 768 (mon.),

This genus is characterised by the slender antennae and partly reduced setae. Frons with a median longitudinal depression in place of the mid-frontal stripe. Anterior orbital seta and ocellar setae absent. Antennae long and porrect, second antennal segment slender, almost rod-like, third tapered towards apex, arista short whitish pubescent. Face concave anteriorly, cheeks high. Humeral, presutural, one postalar, anterior or both dorsocentral, prescutellar, and one pair of scutellar setae absent. Prosternum haired, and all parts of pleura also covered with scattered short hairs. Subalar setae absent. Inner posterior margin of hind coxae short haired. Hind femora without any dorsal setae but with short and strong ventral spines in both sexes. Hind tibia with or without preapical seta. Wings relatively narrow with slightly arcuate posterior cross-vein. Male cerci long and exposed, male genitalia unusually symmetrical including protandrium and hypandrium. Sternum 5 relatively broad, ventral process of sternum 6 absent, small ventral sclerite distinct. Gonostyli rather short and rounded externally, short ejaculatory apodeme with a ventral ridge apically, postgonites somewhat elongated.

In the main, the larvae of *Sepedon* are typical aquatic predators of pulmonate snails. They are able to swim, and the well-developed marginal lobes around the posterior spiracular disc and the long interspiracular palmate float-hairs show that they have fully adapted to the aquatic environment. Puparia are also usually well-adapted for floating on the water-surface. Eggs are laid above water on grasses and other vegetation in the usual way, side by side in groups. The biology and complete life cycles of the two common European species are included in a comprehensive study by Neff & Berg (1966).

The genus includes more than 90 species and is found in all the main zoogeographical regions. It is thus the largest genus of the family, but only 3 species are known to occur in Europe; of these *S. hispanica* is confined to southern Spain, the other two both occur in Britain.

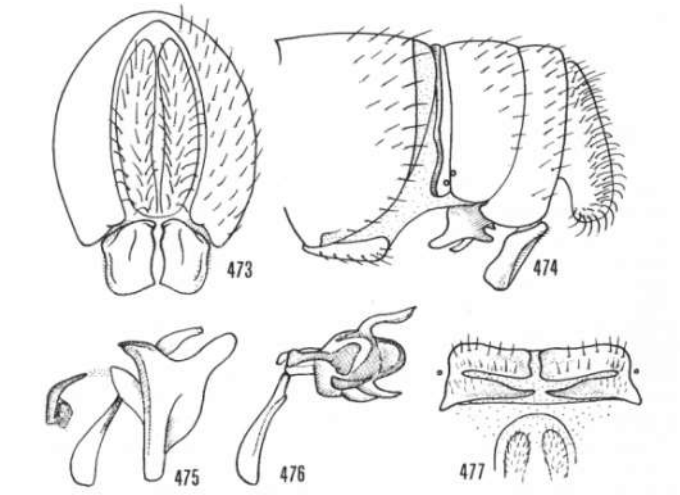
Sepedon sphegea (Fabricius, 1775)

Syrphus sphegeus Fabricius, 1775: 768.

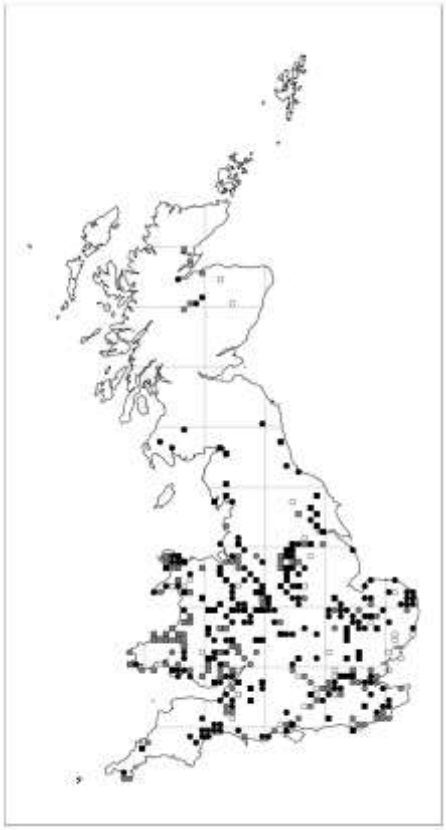
Description: Body bluish-black, legs contrasting reddish-yellow. Two rounded velvety black spots on upper face near eye-margin. Antennae entirely black, but arista whitish pubescent, second antennal segment slender and much longer than the third. Both pairs of dorsocentral setae absent. Hind femora long and thickened, ventral spines developed in both sexes. Wings greyish-brown infuscated. Male genitalia: gonostyli suboblong in caudal view, sternum 5 divided medially and transversely, posterior process of hypandrium rounded apically. Length: body 7.0-9.5 mm, wing 6.2-7.6 mm.

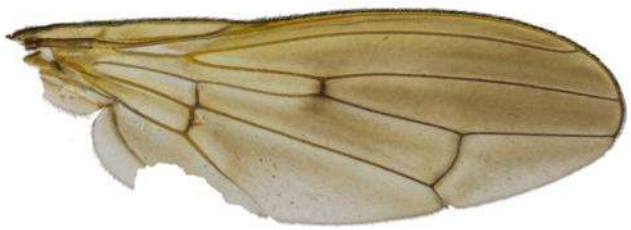
Distribution: Widespread in the Palaearctic region through the Atlantic and continental zones of Europe to the European parts of Russia and on through Armenia, Iran and Iraq to Afghanistan, Mongolia, India, China and the northern Pacific coast of Russia. Also known from North Africa (Morocco). Frequent and often abundant beside ponds and ditches throughout Britain. Recorded from 31 hectads before 1980 and 325 hectads since.

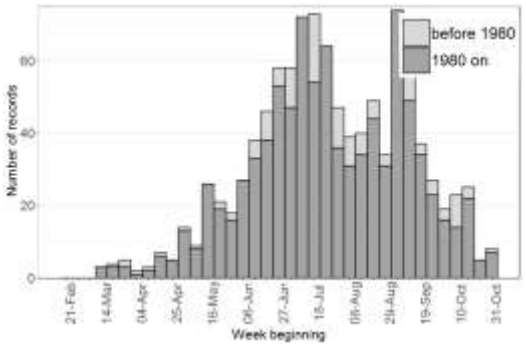
Biology: Adults are found beside still and slow-flowing water in a wide range of wetlands, permanent and temporary. The biology and immature stages were studied by Neff & Berg (1966). Eggs are laid on waterside vegetation. The larvae are aquatic predators, feeding at the water surface. The puparia are formed in the water and float at the water surface. The entire length of the larval stage was 11-16 days in the laboratory, and of the pupal period 5-12 days. The species over-winters as an adult, derived from the generation that pupates in the autumn. Egg laying is delayed in the over-wintering females which start to lay eggs towards the end of winter and continue to oviposit until they die in early spring. A succession of generations then follows. Flight period from late March to October or November.



Figs. 473-477. Male genitalia of *Sepedon sphegea* (Fabr.). – 473: andrium in caudal view; 474: male postabdomen in lateral view; 475: inner copulatory organ; 476: aedeagal apodeme and aedeagus; 477: sterna 5 and 6.







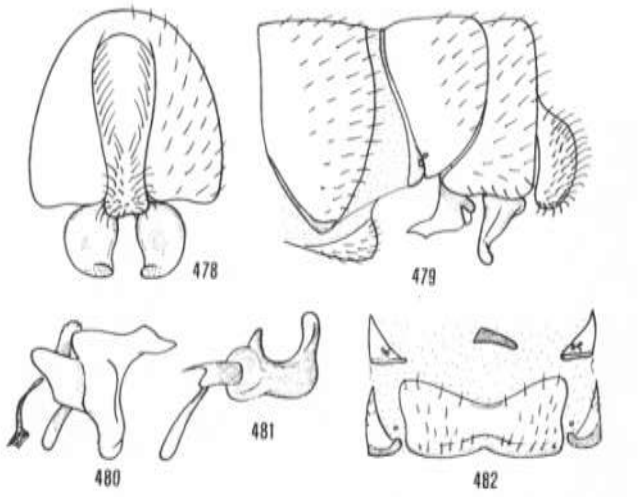
Sepedon spinipes (Scopoli, 1763)

Musca spinipes Scopoli, 1763: 342.
Sepedon haeffneri Fallén, 1820a: 3.

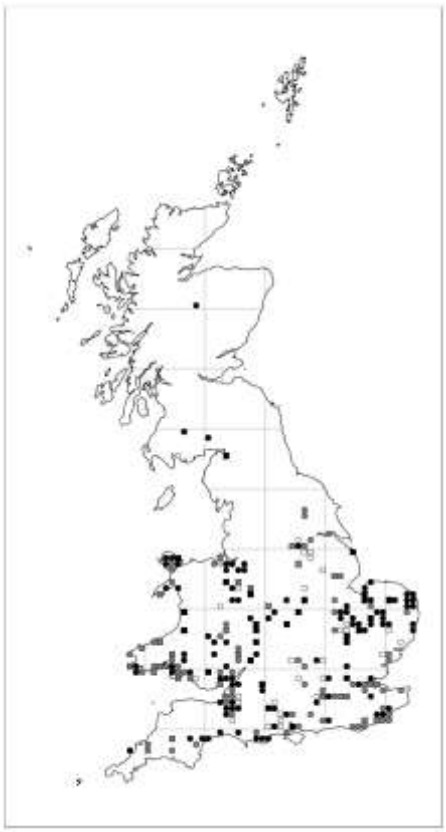
Description: Body yellow to reddish-brown, but legs paler, ochre-yellow. Frons with two oval black spots in place of the missing anterior orbital setae and a further pair of velvety black spots on upper face (or more exactly on parafacials) at eye-margin. Antennae yellowish-brown, third segment blackish apically, second segment slender but only slightly longer than the third. Hind femora even longer and more thickened than in *S. sphegea*, with ventral spines in distal half in both sexes. Hind tibiae without dorsal preapical setae. Wings yellowish tinged. Male genitalia: gonostyli rounded externally, sternum 5 simple, only slightly emarginate posteriorly, posterior process of hypandrium pointed apically. Length: body 5.5-7.2 mm, wing 5.4-6.6 mm.

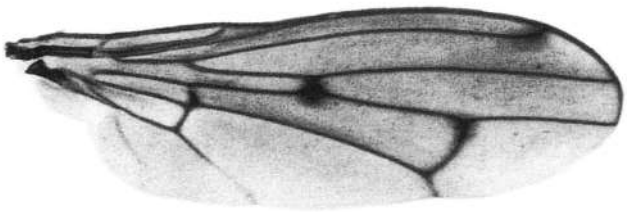
Distribution: Holarctic: widespread in Europe, European parts of Russia through Siberia to the Pacific; North Africa (Morocco); transcontinental in the Nearctic. Frequent beside ponds and ditches throughout England and Wales, but scarce in the north of England and Scotland. Recorded from 27 hectads before 1980 and 216 hectads since.

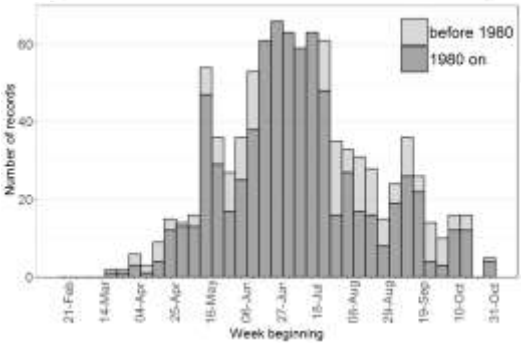
Biology: Beside still and slow-moving water in a wide range of wetlands. The biology and the immature stages were studied by Neff & Berg (1966). In the laboratory, larvae are aquatic predators which feed on a variety of aquatic pulmonate snails at the water surface. Larvae observed in the field killed and ate *Planorbis planorbis.* Once mature, they crawl out of the water to form the puparium firmly attached to the aerial parts of emergent vegetation. The duration of the larval stage was 11-16 days in the laboratory, and the pupal period was 8-14 days. The species over-winters as an adult. Flight period from March to October or November.



Figs. 478-482. Male genitalia of *Sepedon spinipes* (Scop.). – 478: andrium in caudal view; 479: male postabdomen in lateral view; 480: inner copulatory organ; 481: aedeagus; 482: segments 5 and 6 in ventral view.







Genus *Tetanocera* Duméril, 1800

Tetanocera Duméril, 1800: 439 (as Tétanocère).
Type-species: *Musca elata* Fabricius. 1781 (ICZN. designation and validation of this generic name is required).
Thais Haliday in Curtis, 1837: 280.
Type-species: *Tetanocera silvatica* Meigen, 1830 (mon.).
Chaetomacera Cresson, 1920: 54.
Type-species: *Musca elata* Fabricius, 1781 (orig. des.).
Chaetotelanocera Mayer, 1953: 206 (as subgenus of *Tetanocera*).
Type-species: *Tetanocera robusta* Loew, 1848 (orig. des.).

Yellow to reddish-brown flies with varying amounts of whitish, yellowish or grey pruinosity. Mid-frontal stripe mostly stripe-like and shining, sometimes indistinct because frons partly subshining (*T. fuscinervis*) or completely shining (*T. hyalipennis*). Two orbital setae always present. A brownish spot between base of antennae and eye-margin more or less distinct in some species (e.g. *T. punctifrons*). Second antennal segment at least ⅓-½ as long as third segment, often longer. Third antennal segment tapered towards a rounded apex. Arista with black hairs, entire plumosity usually about as broad as third antennal segment at base or slightly narrower, but aristal hairs sometimes very short (e.g. in non-British *T. brevisetosa* and *T.*

Iapponica). Cheek moderately broad in most species, much broader than half an eye only in *T. Iapponica*. Mesonotum usually yellowish pruinose, with narrow dark longitudinal stripes. All dorsal thoracic setae well-developed. Prosternum usually bare, with several hairs only in *T. robusta* Loew. Meso- and pteropleura always bare; subalar setae absent. Inner posterior margin of hind coxae bare. Middle femora rarely with 1-3 strong preapical setae on posterior side in addition to 1-2 setae near middle of anterior side (in *T. punctifrons* and *robusta*). Hind femora with 2-4 anterodorsal setae in distal part; one posteroventral seta opposite apical anterodorsal seta present in *T. arrogans* and *montana*. Ventral setae on hind femora dense and long in males but reduced to a few longer setae in females. Hind tibiae with a strong preapical seta in an almost dorsal position, and a further smaller preapical seta in an anterodorsal position; this second preapical seta sometimes absent in *T. fuscinervis*.

Wings without any special pattern, often uniformly infuscated, but only costal border and/or both cross-veins intensively darkened in some species. Posterior cross-vein straight, arcuate or slightly S-curved. The following parts of the male genitalia appear to be taxonomically significant: the shape of the gonostyli, of the posterior process of hypandrium, of sternum 5, of the ventral part of sternum 6, and in some cases also form of the periandrium and the intraperiandrial sclerite.

The biological information available points to different feeding habits within the genus: four are known to feed on pulmonate snails as typical aquatic predators (*ferruginea*, *hyalipennis*, *montana*, and *robusta*). Certain parasitoid tendencies have been observed, or are inferred in four species that feed on terrestrial or exposed aquatic snails (*arrogans*, *fuscinervis*, *phyllophora*, *silvatica*), and the larvae of *T. elata* are specialist slug-feeders.

Out of more than 40 species of *Tetanocera*, 22 are known to occur in the Palaearctic region and 11 have been recorded from the British Isles. Relationships among the species of *Tetanocera* are still not very clear. *T. robusta* is apparently the most isolated species, and for this reason it has been assigned to a separate subgenus (*Chaetotetanocera*). Some species-pairs are evident among the species : *arrogans* and *montana*, *elata* and *phyllophora*, *freyi* and *silvatica*.

Tetanocera arrogans Meigen, 1830

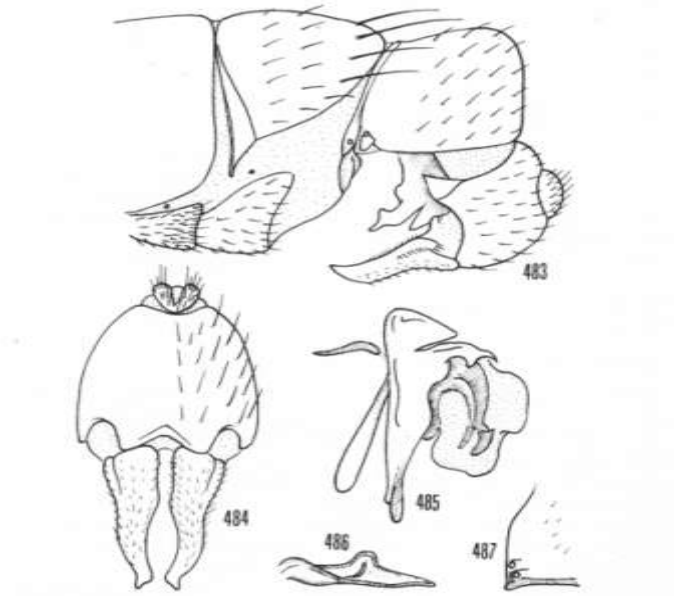
Tetanocera arrogans Meigen, 1830: 41.

Description: Anterior orbital seta at middle of frons, and whitish pruinose patches forming occipital spot fused in basal half. Second antennal segment slightly shorter than the third. Second segment of arista about twice as long as broad. Face and cheeks whitish pruinose. Middle femora with 1-2 setae at middle of anterior side, hind femora with 2-4 anterodorsal setae and one strong posterodorsal seta near tip. Wings yellowish tinged, with a dark patch around apex of vein R_{2+3}. Posterior cross-vein slightly arcuate. Male genitalia: gonostyli pointed in lateral view but slightly flattened in caudal view; posterior process of hypandrium bifid apically; ventral part of sternum 6 with a short median protuberance. Length: body 7.5-10.6 mm, wing 7.2-8.4 mm.

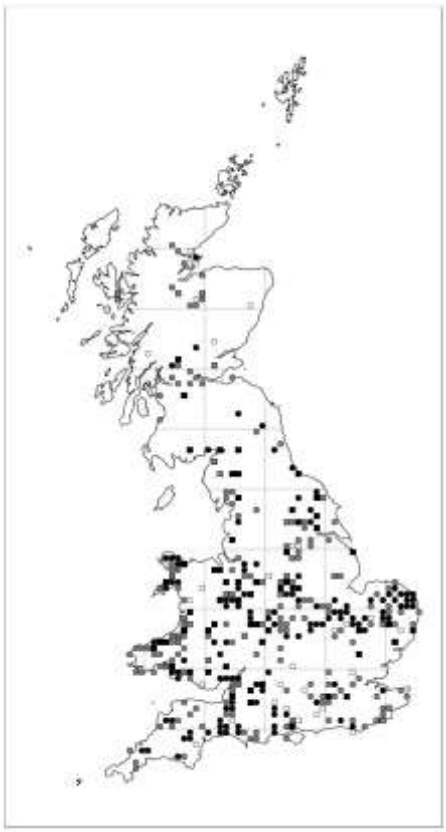
Distribution: Eurasian: in Europe from Lapland south to Spain, Ireland (Nash, 1975) eastwards to Greece and Turkey; European parts of Russia through Siberia to the Pacific and Japan. Frequent in a wide range of wetlands, including grazing marshes, throughout Britain. Recorded from 29 hectads before 1980 and 353 hectads since.

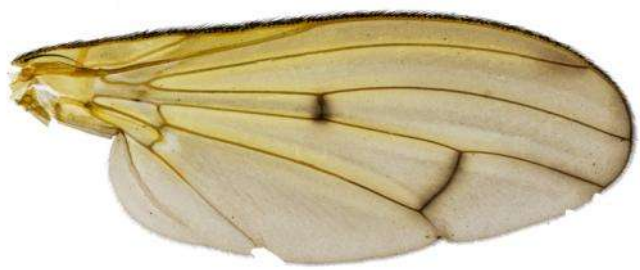
Biology: Adults found in a wide range of wetlands and damp woodland with well vegetated margins. The immature stages were described and figured by Vala (1989), Berg (1961) and Knutson (1970b). Eggs are laid on along the edges of leaves. In the field it is a terrestrial parasitoid/predator of Succineidae and, in the

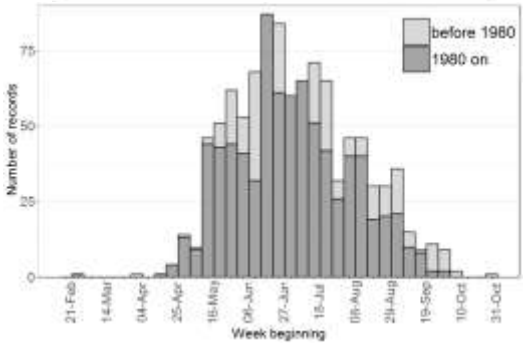
laboratory, it also fed on *Cepaea nemoralis* and *Hygromia hispida*. The puparium is formed away from the host and has been found in litter near water (Rozkošný, 1967). The flight period extends from May to September.



Figs. 483-487. Male genitalia of *Tetanocera arrogans* Meig. – 483: male postabdomen in lateral view; 484: andrium in caudal view; 485: inner copulatory organ; 486: ventral part of sternum 6; 487: arrangement of 6th and 7th abdominal spiracles on the right side.







Tetanocera elata (Fabricius, 1781)

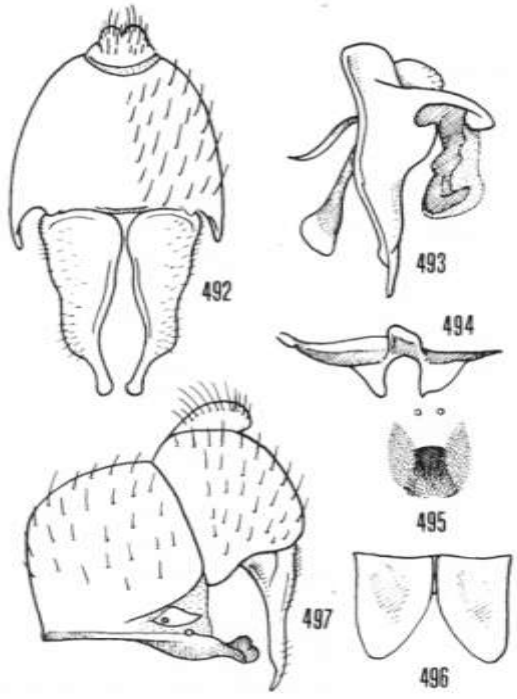
Musca elata Fabricius, 1781: 441.

Description: A species with a markedly darkened costal margin on wing. Anterior orbital seta at middle of frons, whitish pruinose patches forming occipital spot separated by a broad brown median band. Second antennal segment only a little longer than half length of third. Second segment of arista about as broad as long. Face and cheeks whitish pruinose. Middle femur with one seta at middle of anterior side, hind femur with 2-3 anterodorsal setae and without any posterodorsal seta.

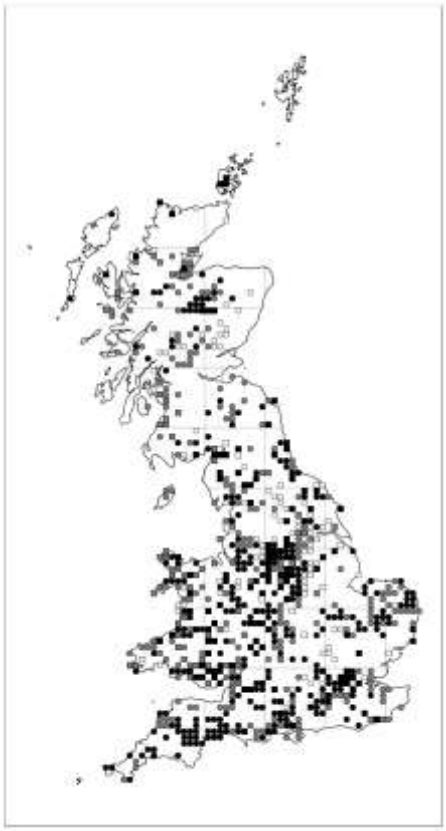
Wings yellowish-brown tinged, with dark brown infuscation along costal margin and both cross-veins. Male genitalia: gonostyli relatively slender, abruptly tapered in apical part; posterior process of hypandrium simply pointed, ventral part of sternum 6 dilated, with a proximal emargination and a short protuberance in middle. Length: body 6.2-8.5 mm, wing 5.6-6.4 mm.

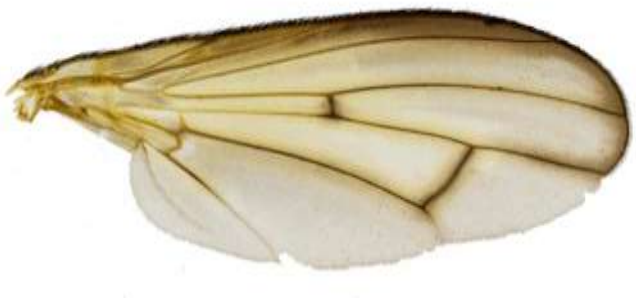
Distribution: One of the commonest species of the genus throughout Europe. Eurasian: widespread in Europe from Lapland to Spain and the Balkans; from the European parts of Russia through Siberia to the Pacific, Japan, Mongolia and China. Common in grasslands, wetlands and woodlands throughout Britain. Recorded from 102 hectads before 1980 and 664 hectads since.

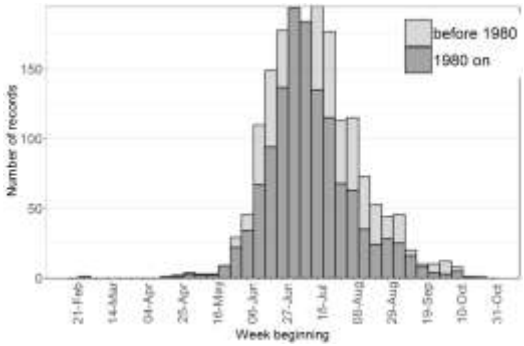
Biology: Common in herbaceous vegetation in wet to damp terrestrial situations. The biology of this species was studied in detail by Knutson, Stephenson & Berg (1965). The young larva is a parasitoid of various slugs, living under the mantle with its posterior spiracles exposed. The older larva is predatory, attacking the slug's nervous system to immobilise the animal. Trelka & Berg (1977) showed that third-instar larva does this with a toxic injection. The species has been reared from *Arion circumscriptus*, *Deroceras laeve*, *D. reticulatum*, *Limax maximus* and *Milax gagetes* in the laboratory. The puparium is formed away from the host on or just below the soil surface and the species probably over-winters in the puparium. During a five-month period of activity, two generations may be produced, and a third may develop as far as the overwintering pupal stage. The puparium and the larval cephalopharyngeal skeleton were described by Rozkošný (1965). The known flight period extends from late May to September.



Figs. 488-498: Male genitalia and occipital spot of *Tetanocera* spp. 492-497: *T. elata* (Fabr.); 492: andrium in caudal view; 494: ventral part of sternum 6; 493: inner copulatory organ; 497: andrium and male postabdomen in lateral view; 495: occipital spot; 496: intraperiandrial sclerite.







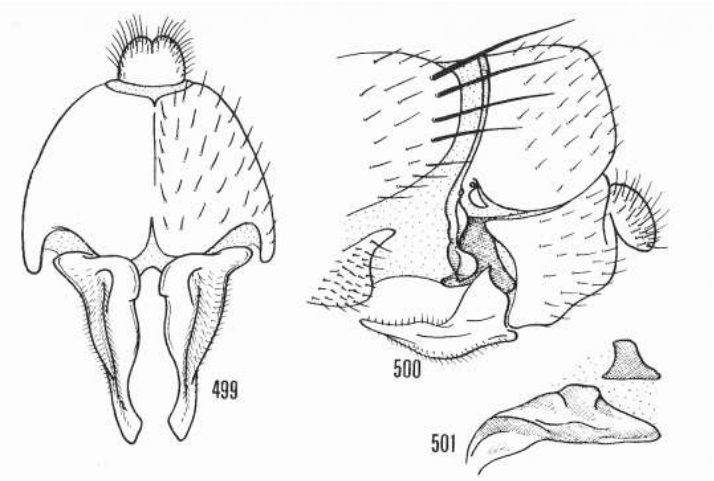
Tetanocera ferruginea Fallén, 1820

Tetanocera ferruginea Fallén, 1820a: 9.
Tetanocera brunnipennis Frey, 1924: 51.

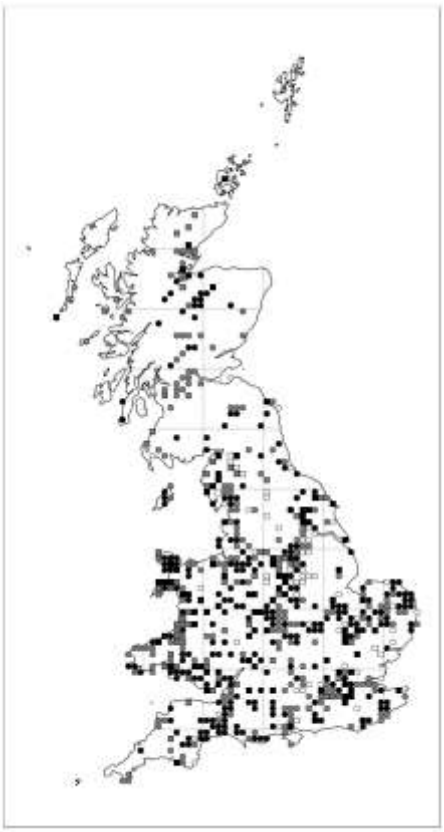
Description: A relatively large species, without distinctly apotypic external characters. Anterior orbital seta at middle of frons, occipital spot with a brownish triangle in middle of upper half. Second antennal segment only slightly longer than half length of the third. Second segment of arista about twice as long as broad. Face and cheeks yellowish pruinose. Middle femur with 1-2 setae at middle of anterior surface, hind femur with one row of 3-4 anterodorsal setae. Wings with a yellowish tinge, darkened along cross-veins and sometimes along tips of veins R_{2+3}, R_{4+5}, and M. Male genitalia: gonostyli long and pointed in lateral view but rather flat apically in caudal view; posterior process of hypandrium emarginate subapically; ventral process of sternum 6 massive, dilated at middle. Length: body 7.4-9.8 mm, wing 6.4-8.4 mm.

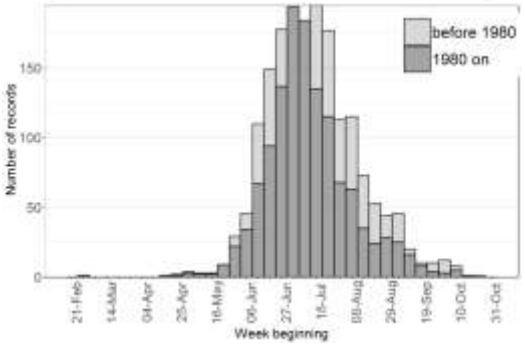
Distribution: Holarctic; throughout the Palaearctic region, in Europe from Lapland to Spain to Greece; European parts of Russia through Siberia to the Pacific, Japan, Mongolia and China; transcontinental in the Nearctic. Very common throughout Britain in a wide range of wetlands. Recorded from 59 hectads before 1980 and 584 hectads since.

Biology: Adults found in all sorts of open, freshwater situations. The larvae live as typical predators of aquatic pulmonate snails in shallow stagnant water. This is the most widely studied species and there are more records of the immature stages being found in nature than for any other species. The larva is a generalised aquatic predator of a wide range of aquatic pulmonate gastropods. In Europe, prey includes the genera *Bathyomphalus*, *Galba*, *Physella*, *Planorbis* and *Stagnicola*. It has also been found in egg masses of *Stagnicola*. In the laboratory, larvae tended to consume whatever was most abundant, irrespective of species, but this did depend somewhat on the combination of prey offered. The puparium is formed away from the host and in the water. Polyvoltine, over-winters in the puparium. The flight period extends from May to late September.



Figs. 499-505. Male genitalia of *Tetanocera* – 499-501: *T. ferruginea* Fall.
499: andrium in caudal view; 500: male postabdomen in lateral view;
501: ventral part of sternum 6 and ventral sclerite;





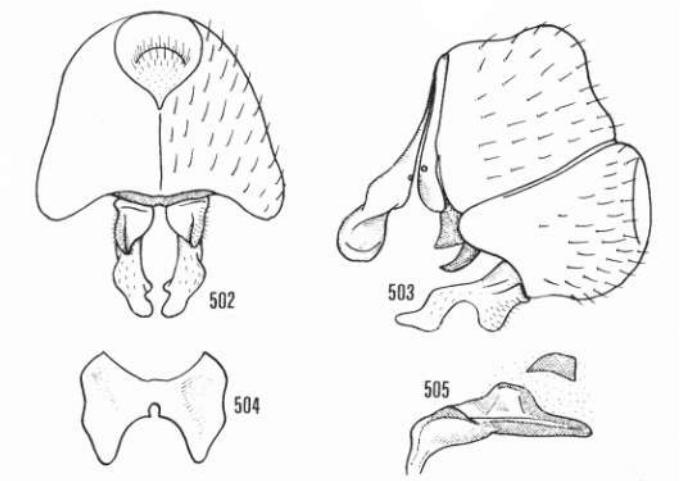
Tetanocera freyi Stackelberg, 1963

Tetanocera freyi Stackelberg, 1963: 915.

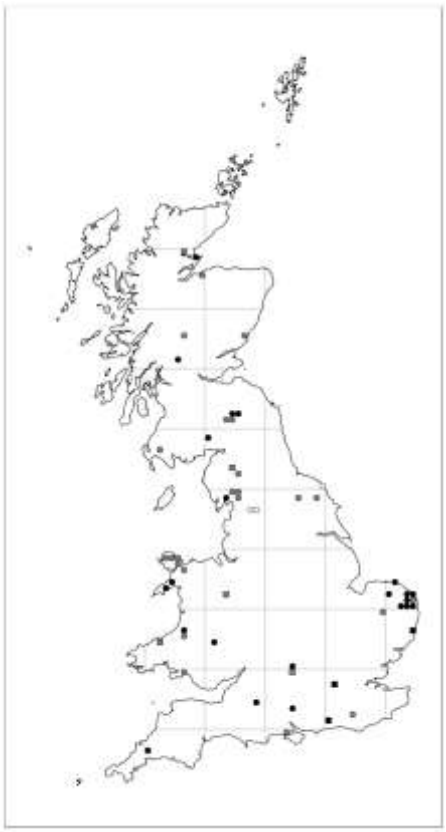
Description: This species was separated from the very similar *T. silvatica*. As in this species, the anterior orbital seta is at the middle of frons and the anterior margin of frons is broadly shining. Occipital spot different: whitish pruinose lateral patches usually well-separated by a band-shaped median brown spot. Face and cheeks golden-yellow pruinose. Second segment of arista about twice as long as broad. Male genitalia: gonostyli strikingly protuberant posterobasally but simply pointed apically in lateral view; ventral part of sternum 6 distinctly broader than in *silvatica*. Length: body 7.2-8.4 mm, wing 6.5-6.7 mm.

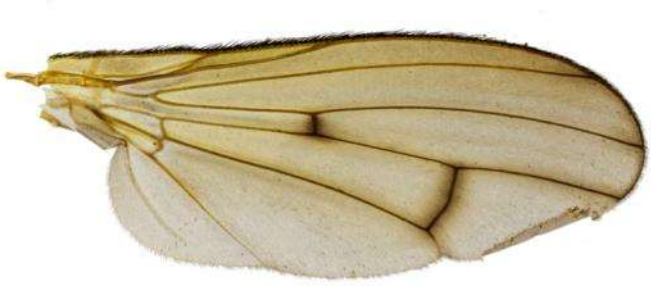
Distribution: Holarctic: in Europe, Scandinavia south to northern France, Ireland eastwards to the European parts of Russia; Alaska to Alberta in North America. Scarce in fens and *Carex* swamps throughout Britain, although it can be abundant where it occurs. '**Rare**' (RDB3) according to Falk (1991). Recorded from 4 hectads before 1980 and 53 hectads since.

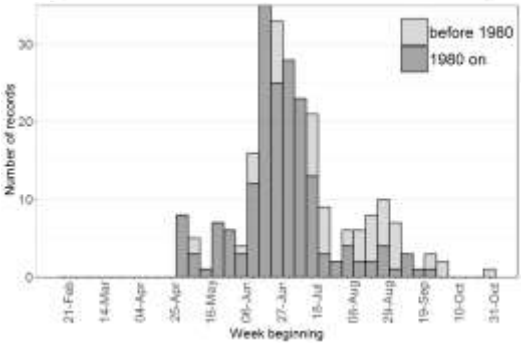
Biology: Adults are found at pool margins in raised bog, transition mire, fens and marshes. Immature stages unknown. Flight period from April to September.



Figs. 499-505. Male genitalia of 502-505: *T. freyi* 502: andrium in caudal view; 503: male postabdomen in lateral view; 505: ventral part of sternum 6 and ventral sclerite; 504: intraperiandrial sclerite.







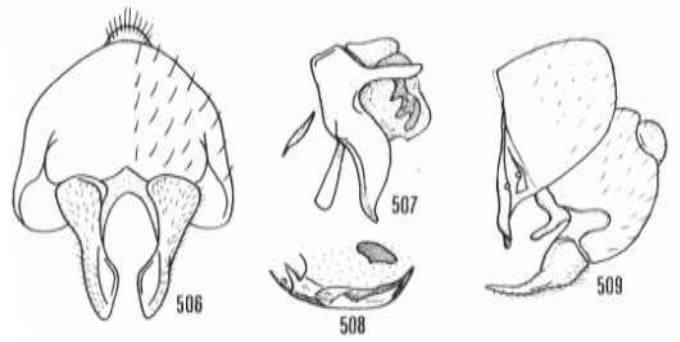
Tetanocera fuscinervis (Zetterstedt, 1838)

Sciomyza fuscinervis Zetterstedt, 1838: 737.
Tetanocera unicolor Loew, 1847: 199.

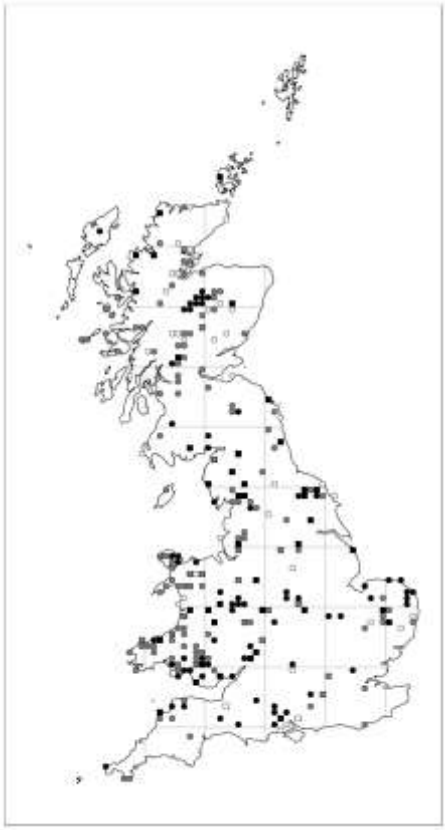
Description: A relatively small and dark species. Mid-frontal stripe not distinct, central area of frons uniformly subshining. Anterior orbital seta placed somewhat before middle of frons. Occipital spot mainly whitish pruinose, without median brown spot. Second antennal segment unusually short, often about ⅓ as long as length of the third segment. Second segment of arista about twice as long as broad. Legs, especially femora, shorter and thicker than in other species. Middle femora with 2 anteromedian setae, hind femora usually with only 2 anterodorsal setae. Wings greyish-yellow with broadly infuscated cross-veins. Male genitalia: gonostyli dilated in apical half but pointed in lateral view; posterior process of hypandrium slender and long; ventral part of sternum 6 rather broad and simple, pointed apically. Length: body 5.4-7.2 mm, wing 4.6-5.9 mm.

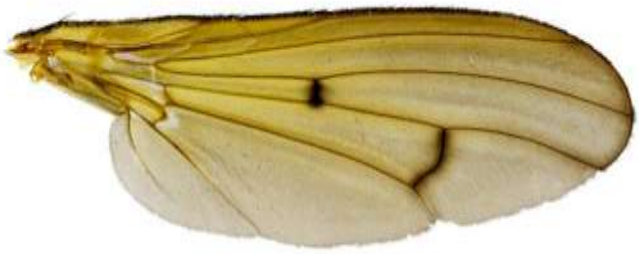
Distribution: Holarctic: in Europe from Lapland south to the Mediterranean coast of France, Ireland eastwards to parts of the former Yugoslavia; European Russia through Siberia to the Pacific; Mongolia; transcontinental in the Nearctic. Mainly a north-western species, often on flushed peatlands. Recorded from 39 hectads before 1980 and 231 hectads since.

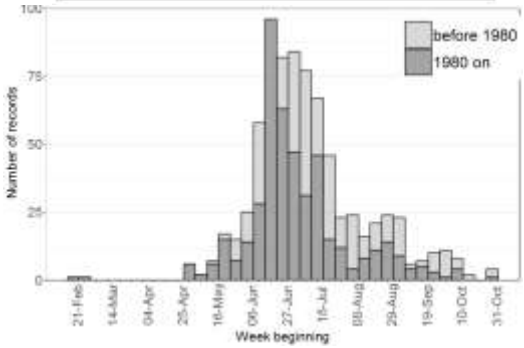
Biology: Adults are found in open wetlands including transition mire, fens and marshes. All the immature stages were described by Rozkošný (1967). The larva is a water-edge predator of exposed individuals of Lymnaeidae, Physidae and Planorbidae. Knutson & Berg (1971) also recorded various terrestrial gastropods of the genera *Cochlicopa*, *Discus*, *Helix* and *Hygromia* as larval prey in the laboratory. The length of the entire larval stage in the laboratory was about 22 days, and the pupal period lasted about 15 days. The species is probably bivoltine and over-winters in the puparium. The known flight period extends from May September or early October.



T. fuscinervis (Zett.); 506: andrium in caudal view; 507: inner copulatory organ; 508 : ventral part of sternum 6 and ventral sclerite; 509: male postabdomen and andrium in lateral view;







Tetanocera hyalipennis Roser, 1840

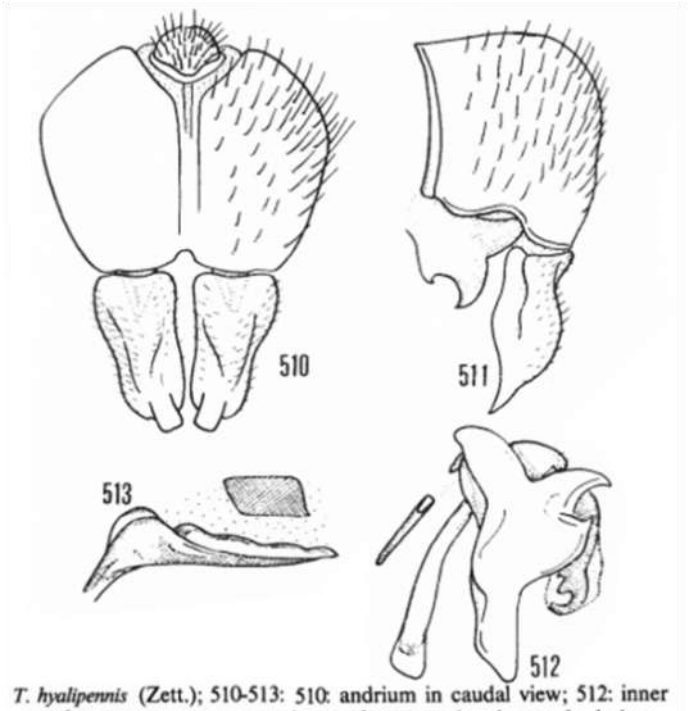
Tetanocera hyalipennis Roser, 1840: 61.

Description: A species characterised by a conspicuously shining frons. Mid-frontal stripe virtually indistinct, anterior orbital seta situated before middle of frons. Occipital spot with a broad dark brown median band. Second antennal segment short, about half as long as third. Second segment of arista barely longer than wide. Face yellowish and cheeks whitish pruinose. Legs relatively slender and long. Middle femora with 1 anteromedian seta, hind femora with 3 anterodorsal setae. Wings yellowish (especially at base), anterior margin darkened in apical half and both cross-veins infuscated. Male genitalia: gonostyli broad with a short apical part; posterior process of hypandrium short and pointed, and a second pointed projection present

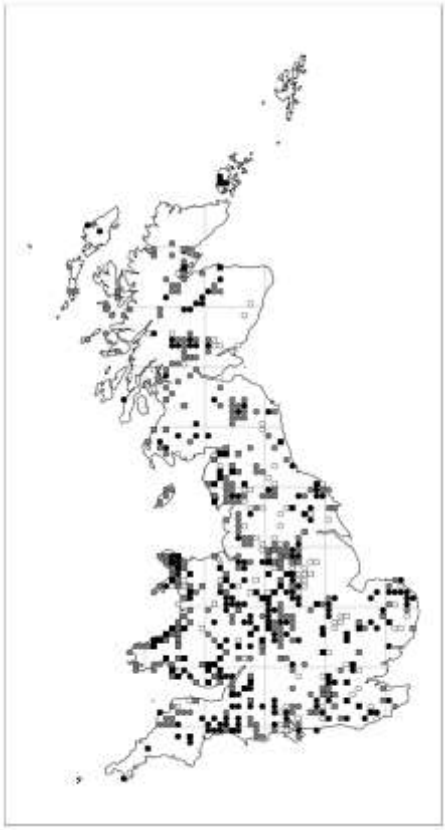
more proximally; ventral part of sternum 6 gradually tapered towards apex. Length: body 6.0-8.4 mm, wing 5.2-7.2 mm.

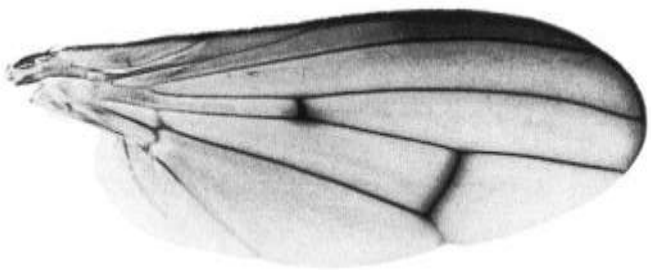
Distribution: Eurasian: widespread in Europe from Lapland south to Spain, Ireland eastwards to the former Yugoslavia; European Russia through Siberia to the Pacific; Georgia, Kazakhstan. Common throughout Britain on flushed areas and in wet *Alnus* or *Salix* carr. Recorded from 89 hectads before 1980 and 510 hectads since.

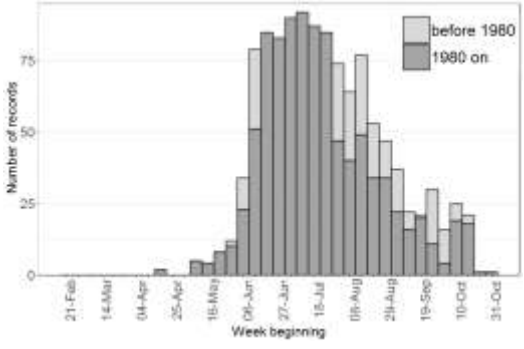
Biology: Adults are found both in open situations and wet woodland at flushes and pool margins. Knutson (1970b) described the immature stages, but the species has not been reared through its complete life cycle. In the laboratory, the larva is predatory on aquatic gastropods. The number of generations per year and the over-wintering stage are uncertain. The flight period extends from late May to end of September.



T. hyalipennis (Zett.); 510-513: 510: andrium in caudal view; 512: inner copulatory organ; 513: ventral part of sternum 6 and ventral sclerite; 511: male postabdomen and andrium in lateral view;







Tetanocera montana Day, 1881

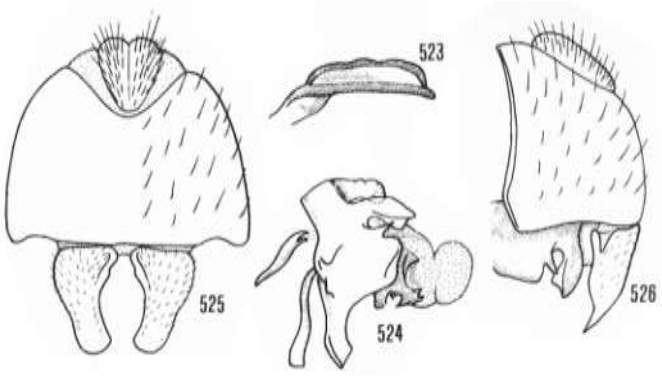
Tetanocera montana Day, 1881: 87.
Tetanocera borealis Frey, 1924: 51.

Description: Resembling *T. arrogans*, especially in the presence of posterodorsal seta on hind femora. Anterior orbital seta somewhat before middle of frons, occipital spot with a broad brown median band. The

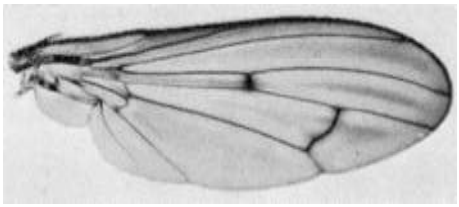
brightly shining mid-frontal stripe is longer than that of *T. arrogans*. In both sexes, at most one sixth of the length of the frons is dull across its entire width anteriorly, whereas this applies to one-fifth to one-third in *T. arrogans*. Second antennal segment almost as long as third or slightly shorter. Second segment of arista about 2.5 times as long as broad. Face and cheeks golden-yellow pruinose. Thorax especially in females distinctly more pruinose than in *arrogans*. Middle femur with 1-2 anteromedian setae, hind femur with 2-4 anterodorsal and 1 posterodorsal setae. Both cross-veins infuscated, posterior cross-vein slightly S-curved. Male genitalia: gonostyli broad in apical half in caudal view, relatively short and sharply pointed in lateral view; posterior process of hypandrium dilated apically, with a spine-like projection at base; ventral part of sternum 6 broad, with a very short tip. Length: body 7.5-9.2 mm, wing 6.6-7.4 mm.

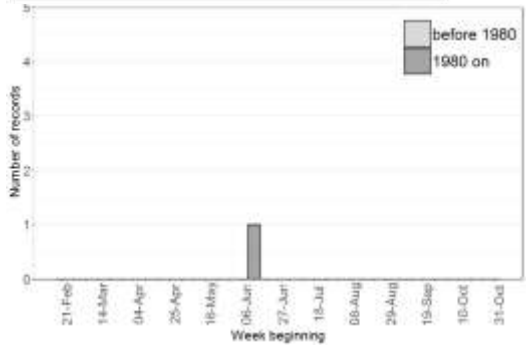
Distribution: Holarctic: in Europe from Lapland south to Belgium, Ireland eastwards to Hungary and Turkey; European parts of Russia, Ukraine, Armenia, Mongolia; trancontinental in the Nearctic. Only known from Co. Cork, Ireland (Speight 2007) and on 9 June 2008, from Bruern Abbey, Oxfordshire (Stubbs 2009). Recorded from 0 hectads before 1980 and 1 hectad since. This species is difficult to separate from the common *T. arrogans*, especially in the female (best separated by examination of the male genitalia), and may well have been overlooked.

Biology: Adults can be found in tall sedge beds along the margins of standing water. Foote (2013) reared the species through its entire life cycle in America. The aquatic larvae were found in the field on decaying stems of a sedge floating in the standing water of a swamp. Once transferred to the laboratory, they fed on a wide range of gastropods. The puparium was formed away from the host in the water. Probably univoltine with eggs or young larvae over-wintering. Flight period May to September according to Speight & Knutson (2012).



T. montana Day. – 524: inner copulatory organ; 523: ventral part of sternum 6; 525: andrium in caudal view. 526: andrium in lateral view;





Tetanocera phyllophora Melander, 1920

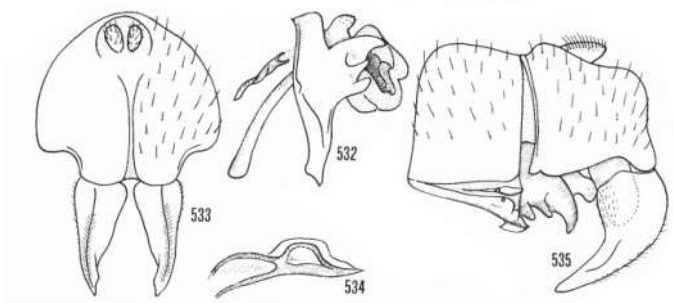
Tetanocera phyllophora Melander, 1920: 330.
Tetanocera nigricosta auct. nec Rondani, 1868: 37.
Tetanocera elegans Collin, 1960: 209.

Description: This species is externally very similar to *T. elata*, but is usually somewhat smaller and paler. Anterior orbital seta at middle of frons, occipital spot differing from that in *elata*, mainly whitish pruinose, brown median spot usually absent. Second antennal segment barely as long as half length of the third. Second segment of arista at most slightly longer than broad. Face and cheeks whitish pruinose. Middle femur with 1 seta in middle of anterior side, hind femur with 2-3 anterodorsal setae. Wing pattern as in *elata* but infuscation along anterior and apical wing margin and along cross-veins usually narrower and more contrasting with other parts of wing membrane. Male genitalia highly characteristic: gonostyli large and curved, gradually tapered; hypandrium with three projections on posteroventral margin; ventral part of sternum 6 short and abruptly dilated in middle, with a pointed tip. Length: 5.4-7.8 mm, wing 5.2-6.8 mm.

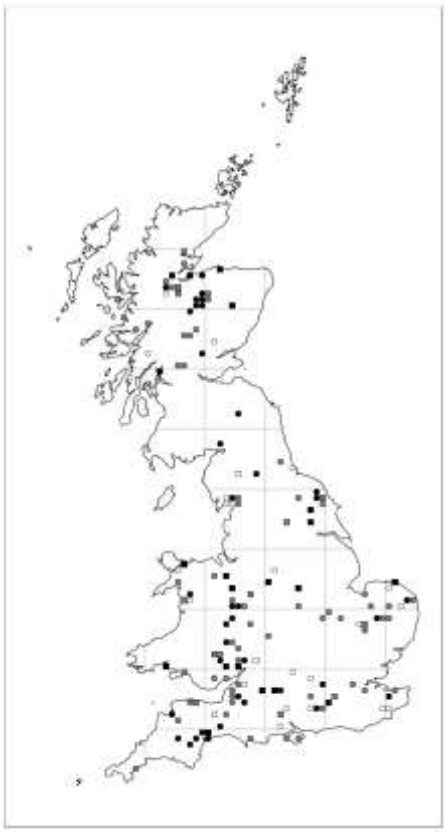
Distribution: Holarctic: Atlantic parts of Europe south to northern France, Ireland eastwards through northern and central Europe to European parts of Russia and on through Siberia to the Pacific; Japan; widespread in North America. Local at the margin of wet woods, often with a calcareous influence,

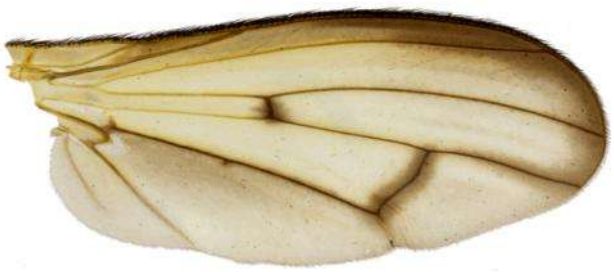
throughout Britain. '**Notable**' according to Falk (1991). Recorded from 24 hectads before 1980 and 129 hectads since.

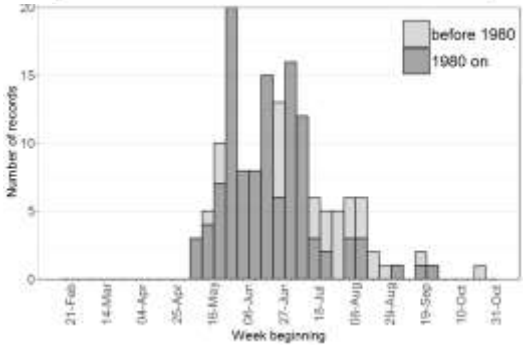
Biology: Adults found in wet woodlands. Foote (2013) reared the species in North America and, with Knutson(1970b) provides information on larval biology. In the laboratory, the larva is a predator of various, mostly terrestrial, gastropods. The young larva invades the host between the mantle and the shell. It feeds on the snail's tissue until the snail dies after which it moves on to another snail. *Clausilia*, *Cochlicopa*, *Discus*, *Helix*, *Hygromia*, *Lymnaea*, *Succinea* and *Zonitoides* have been recorded as prey. It is probable that the puparium is formed away from the host and is the over-wintering stage. Either one or two generations per year. The flight period extends from May to late August or early September.



T. phyllophora Mel. – 533:andrium in caudal view; 532: inner copulatory organ; 534: ventral part of sternum 6; 535: male postabdomen in lateral view.







Tetanocera punctifrons Rondani, 1868

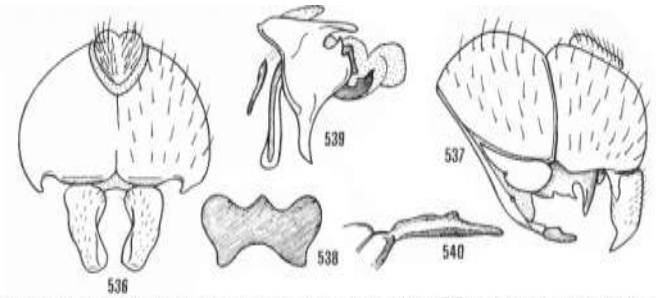
Tetanocera punctifrons Rondani, 1868: 33.
Tetanocera colliarti Verbeke, 1948: 22.

Description: A species in the group with a strong seta on posterior side of middle femur near tip. Anterior orbital seta at middle of frons or slightly before it. Occipital spot with a broad, dark brown median spot. A brownish spot on each side between antennae and eye margin more or less distinct. Second antennal segment about as long as half length of the third, or slightly longer. Total plumosity of arista broader than

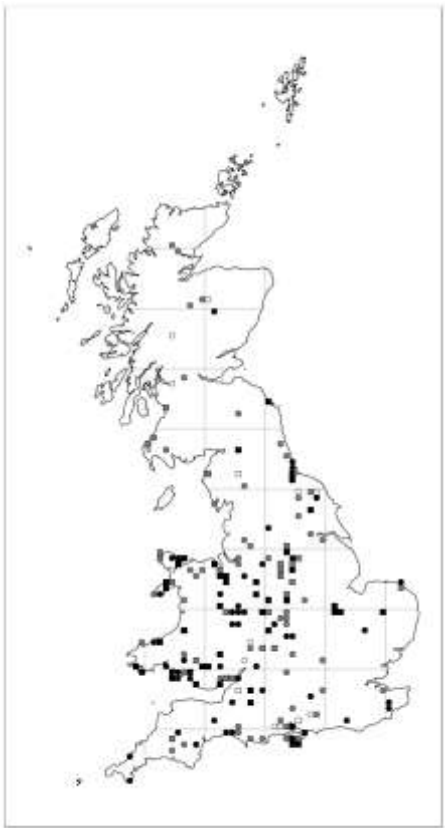
maximum width of antennae. Second segment of arista very short, at most as long as wide. Face and cheeks yellowish pruinose. Middle femur with a strong seta on posterior side near tip in addition to the usual 1 anteromedian seta. Hind femur usually only with 2 anterodorsal setae. Wings somewhat yellowish-brown tinged, more darkened around tip of vein R_{2+3} and along both cross-veins, posterior cross-vein slightly S-curved. Male genitalia: gonostyli rather short and relatively broad even in apical half, with a short and pointed tip in lateral view; posterior process of hypandrium slender and simple, a spine-like process present proximally of it; ventral part of sternum 6 band-shaped, with a short median protuberance. Length: body 6.8-8.6 mm, wing 6.2-7.8 mm.

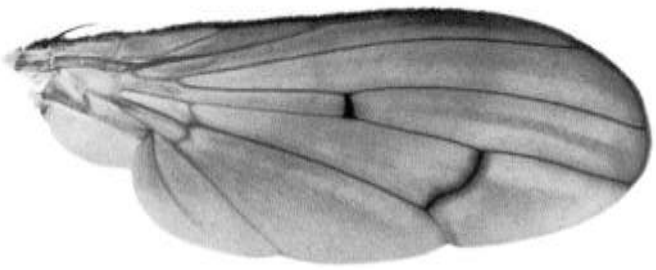
Distribution: A European species, from Scandinavia south to Spain, Ireland eastwards to former Yugoslavia, European Russia, Bulgaria and Romania. Local at wood margins and in wetlands throughout Britain. '**Notable**' according to Falk (1991). Recorded from 11 hectads before 1980 and 169 hectads since.

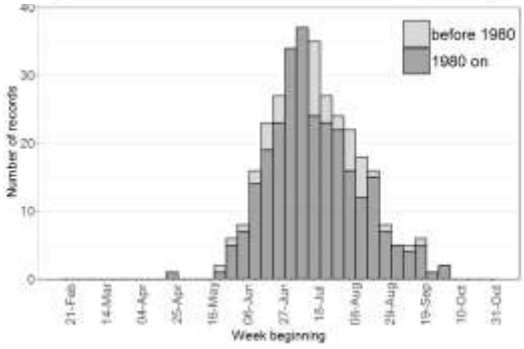
Biology: Adults are found in wet woodland, tall-herb areas in open wetlands, montane fens and stream sides. The larva is a predator of aquatic gastropods. In the laboratory, it has been reared on *Biomphalaria* (Afrotropical), *Gyraulus*, *Helisoma* (Nearctic), *Lymnaea* and *Physa*. The puparium is formed away from the host. Flight period from late May to late August or early September.



Male genitalia of *Tetanocera punctifrons* Rond.; 536: andrium in caudal view; 537: male postabdomen in lateral view; 538: intraperiandrial sclerite; 539: inner copulatory organ; 540: ventral part of sternum 6;







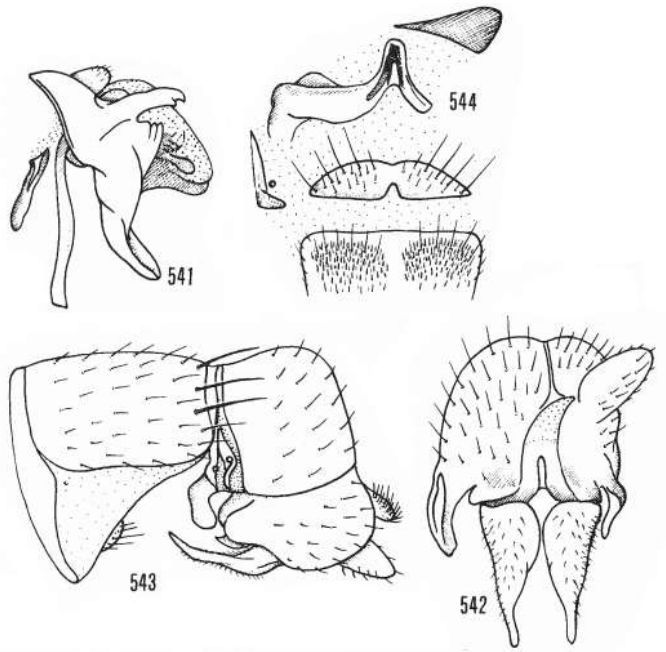
Tetanocera robusta Loew, 1847

Tetanocera robusta Loew, 1847: 197.

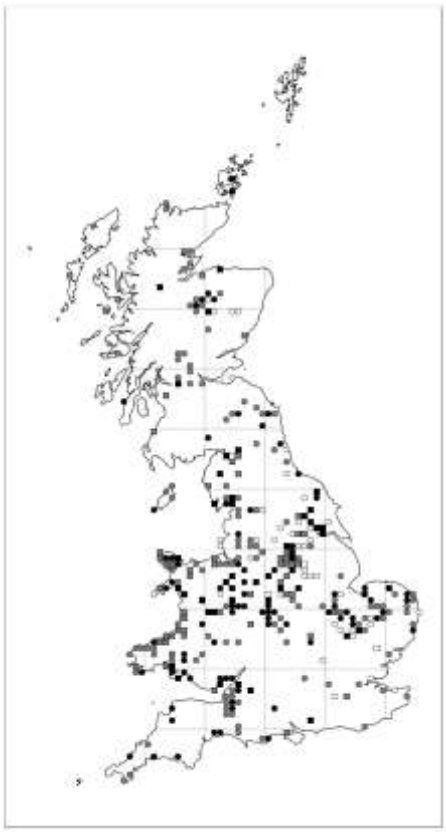
Description: A large species, differing from all other regional species of the genus by the setose prosternum. Anterior orbital seta at middle of frons. Whitish pruinose patches forming occipital spot broadly separated, but the space between them relatively pale, reddish-yellow. Second antennal segment almost reaching length of third segment, black hairs on arista long. Second segment of arista about 2.5 times as long as broad. Face and cheeks golden-yellow pruinose. Mesonotum greyish-yellow pruinose, narrow blackish median stripes very conspicuous. Middle femur with one anteromedian seta, and usually 3 setae present on posterior side near tip. Hind femur with 4-6 anterodorsal setae. Wings relatively long, more infuscated around tips of veins in apical part and along cross-veins, posterior cross-vein slightly sinuate. Male genitalia: periandrium with a conical projection on right side; gonostyli long and tapered, slender especially in lateral view; sternum 5 only narrow and ventral part of sternum 6 with a long median protuberance; posterior process of hypandrium long and slender. Length: body 8.5-12.0 mm, wing 7.6-8.8 mm.

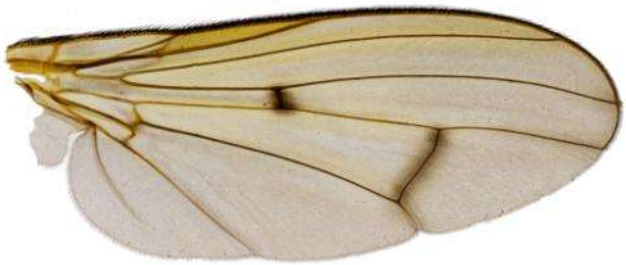
Distribution: Holarctic: in Europe, from Lapland south to Belgium, Ireland eastwards through the Alps (Switzerland) to Hungary; European Russia through Siberia to the Pacific; Mongolia; transcontinental in the Nearctic. Common on grazing marshes and a variety of wetlands throughout Britain. Recorded from 44 hectads before 1980 and 297 hectads since.

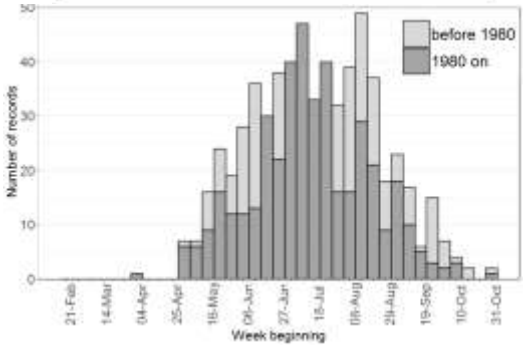
Biology: Adults are found at the margins of ponds, lakes and streams in both permanent and seasonally flooded wetlands. The larvae live as aquatic predators of pulmonate snails (Knutson, 1970b; Foote, 2013). Nielsen *et al*. (1954) found larvae and puparia at several localities in Iceland, mostly in small ponds and dykes but also in hot springs (24°C). In the laboratory, it has been reared on *Biomphalaria* (Afrotropical), *Gyraulus*, *Lymnaea*, *Physa*, *Physella* and *Planorbis*. The puparium is formed away from the host either in the water or just above the water surface on emergent plants. The species over-winters in the pupal stage or as a mature larva. The flight period extends from May to early October.



Male genitalia of *Tetanocera robusta* Loew. – 542: andrium in caudal view; 543: male postabdomen in lateral view; 541: inner copulatory organ; 544: sterna 4-6 and ventral sclerite in ventral view.







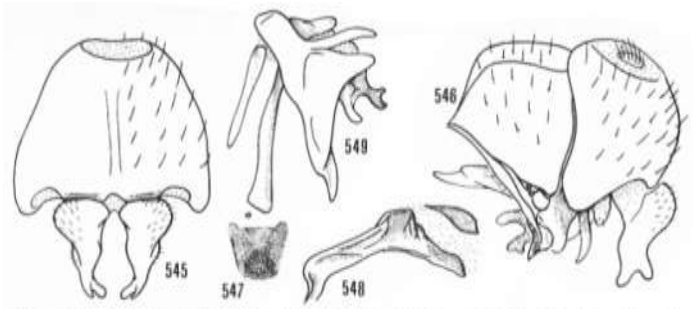
Tetanocera silvatica Meigen, 1830

Tetanocera silvatica Meigen, 1830: 41.

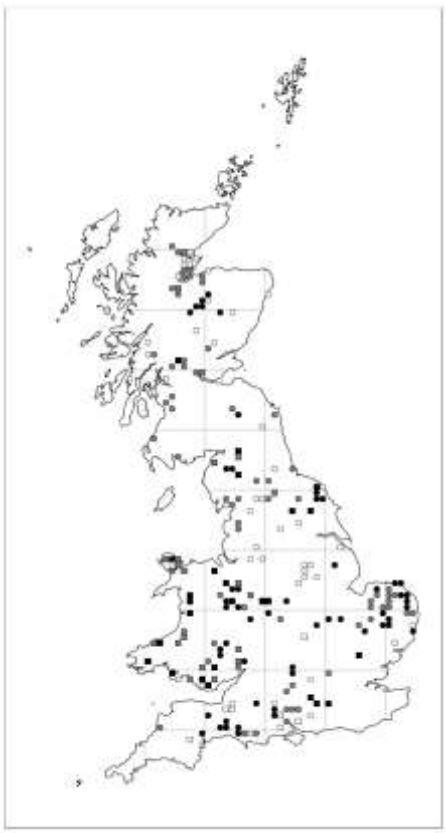
Description: A species characterised by the markedly shining anterior margin of frons, mid-frontal stripes and orbital plates, and in this respect resembling *T. freyi*. Anterior orbital seta at middle of frons, occipital spot with a reduced brownish median band and thereby differing from *freyi*. Second antennal segment about half as long as third segment, arista long-plumose. Second segment of arista very short, at most as long as wide. Face and cheeks whitish pruinose. Mesonotum yellowish pollinose, longitudinal stripes hardly distinct. Middle femur with 1 anteromedian seta, hind femur with 3-5 anterodorsal setae. Wings yellowish, tips of veins in apical part of wing and both cross-veins infuscated, posterior cross-vein slightly arcuate. Male genitalia: gonostyli rather broad even in apical half, distinctly bifid at tips; posterior process of hypandrium slender and long, and hypandrium with a further, more proximal blunt projection; ventral part of sternum 6 massive and band-shaped, broadly protuberant at middle. Length: body 6.2-8.2 mm, wing 5.4-7.0 mm.

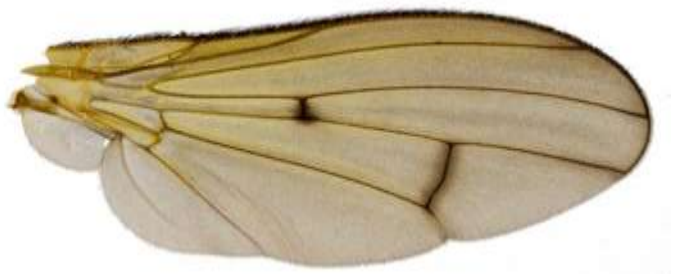
Distribution: Holarctic: in Europe, Lapland south to Spain, Ireland eastwards to European Russia and on through Siberia to the Pacific; transcontinental in the Nearctic. Local in carr woodland and on flushed areas throughout Britain. Recorded from 48 hectads before 1980 and 162 hectads since.

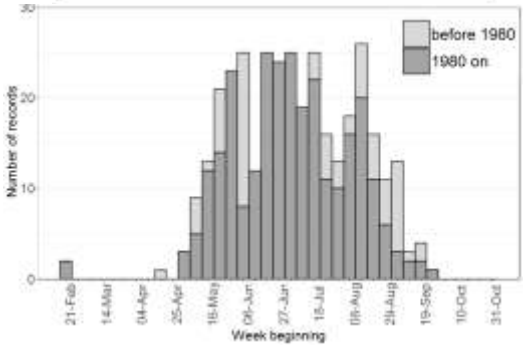
Biology: Adults are found in damp deciduous woodland and carr. Mature larvae have been found amongst plant debris on the edges of partially shaded permanent pools. In the laboratory, eggs are laid either on potential hosts or in their immediate vicinity. Young larvae tend to feed gregariously on aquatic gastropods (*Gyraulus*, *Lymnaea*, *Physa*, *Planorbis*) plus *Oxyloma* and *Succinea*, but later in development become solitary predators of exposed individuals of the same snails. The puparium is formed away from the host and is probably the over-wintering stage. The flight period extends from May to late August or early September.



Male genitalia of *Tetanocera silvatica* Meig. 545: andrium in caudal view; 546: male postabdomen in lateral view; 547: occipital spot; 548: ventral part of sternum 6 and ventral sclerite; 549: inner copulatory organ.







Genus *Trypetoptera* Hendel, 1900

Trypetoptera Hendel, 1900: 352,
Type-species: *Musca punctulata* Scopoli, 1763 (subseq. des. by Cresson. 1920: 66).

A monotypic genus with an ornate body and wing pattern. Mid-frontal stripe distinct though mainly pollinose. Two orbital setae always present, the anterior one inserted close to anterior margin of frons. Occipital spot of the usual form, partly brownish in middle. Second and third antennal segments subequal, arista long black plumose. Face concave and cheek broader than half width of eye. Dorsal thoracic setae fully developed. Prosternum usually with one hair on each side, greater part of mesopleuron haired, and pteropleuron with 3-5 bristle-like hairs. Hairs along posterior margin of mesopleuron often elongated and forming a vertical row. Two short subalar setae present. Middle femur with the usual anteromedian seta.

Inner posterior margin of hind coxae haired. Hind femora with 2 anterodorsal setae. Ventral setae on hind femora dense in males but absent in females. Hind tibia with only one preapical seta, in an anterodorsal position. Wings dark brown and ornamented with numerous rounded whitish spots. Male periandrium not fused below cerci, and other parts of male genitalia resembling most other genera of the Tetanocerini in their structure, with asymmetrical protandrium and mainly symmetrical periandrium and gonostyli. Virtually nothing is known of the biology of this genus, to which only one species has been assigned.

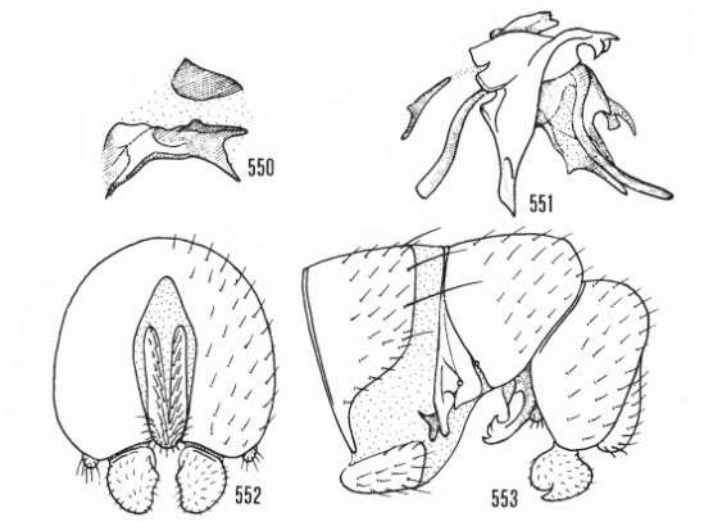
Trypetoptera punctulata (Scopoli, 1763)

Musca punctulata Scopoli, 1763: 338.
Musca hieracii Fabricius, 1775: 787.
Tetanocera nemorum Fallén. 1820a: 8.

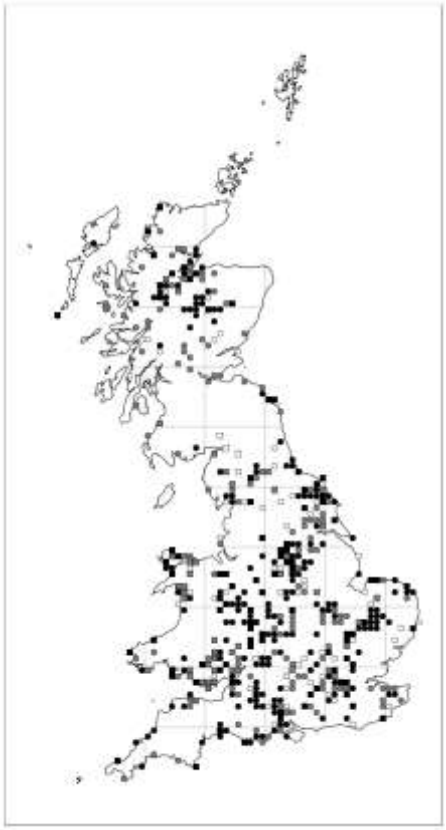
Description: Ground-colour greyish-yellow but various brown spots present on head, thorax, abdomen and femora. Most setae with small brown spots around bases. A subtriangular brownish spot distinct at eye-margin, at level of antennae. Second antennal segment somewhat swollen, total plumosity of arista narrower than antennae; aristal hairs black, sometimes partly whitish at base. Thorax with small brown spots on mesonotum and pleura, and extensive brown spots on sternopleuron. Middle and hind femora with extensive brown spots just before tips. Wings with a characteristic pattern. Abdomen with brown dorsal, lateral and ventral spots. Male genitalia: gonostyli rounded, with a short and curved tip in lateral view: posterior process of hypandrium trifid apically; ventral part of sternum 6 broad and short, ending with two pointed projections. Length: body 4.2-6.4 mm, wing 3.8-5.6 mm.

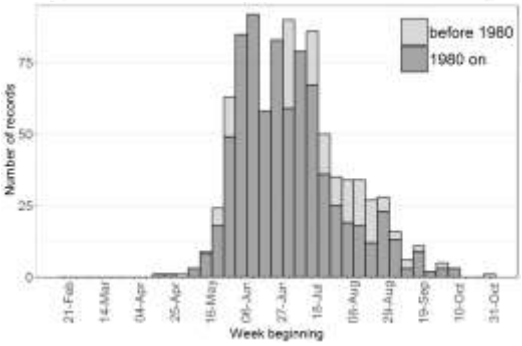
Distribution: Eurasian: widespread throughout Europe; Turkey, Iran, North Africa; European parts of Russia through Siberia to the Pacific; Mongolia. Common and widely-distributed throughout Britain in calcareous grasslands, wetlands and woodlands. Recorded from 57 hectads before 1980 and 438 hectads since.

Biology: Adults are found in grassland ranging from damp to dry and including montane areas and open grassy areas in woodland. Although the species is generally distributed, it appears to prefer calcareous habitats. Vala (1986) reared the species through its entire life cycle in the laboratory and described all stages. There is a prolonged pre-oviposition period in excess of 2 months. The larva feeds on terrestrial gastropods and has been reared in the laboratory on *Candidula unifasciata*, *Cornu aspersum*, *Lauria cylindacea* and *Trochus hispidus*. In the case of *Lauria*, which is viviparous, the first instar larva feeds on the developing young in the pallial cavity of its host, but older larvae attack larger gastropods and do not successfully complete development on *Lauria*. The puparium is usually formed within the host shell. Over-wintering appears to occur in the larval stage and this is believed to be a strictly univoltine species. The flight period extends from May to late August.



Figs. 545-553. Male genitalia of *Trypetoptera punctulata* (Scop.) 552: andrium in caudal view; 553: male postabdomen in lateral view; 550: ventral part of sternum 6 and ventral sclerite; 551: inner copulatory organ.





Checklist

+ indicates that the species occurs in Ireland as well as Great Britain,
++ indicates that it occurs in Ireland only.

SCIOMYZIDAE

PHAEOMYIINAE

PELIDNOPTERA Rondani, 1856
PHAEOMYIA Schiner, 1862
fuscipennis (Meigen, 1830 - Sciomyza)
fumipennis (Zetterstedt, 1846 - Sciomyza)
nigripennis (Fabricius, 1794 - Musca)

SALTICELLINAE

SALTICELLA Robineau-Desvoidy, 1830
LUCINA Meigen, 1830, preocc.
fasciata (Meigen, 1830 - Lucina) +
maculipes (Rondani, 1868 - Eggizoneura)

SCIOMYZINAE

Sciomyzini

COLOBAEA Zetterstedt, 1837
CTENULUS Rondani, 1856
MELANOCHIRA Schiner, 1864
bifasciella (Fallén, 1820 - Opomyza) +
distincta (Meigen, 1830 - Sciomyza) +
pectoralis (Zetterstedt, 1847 - Opomyza) +
punctata (Lundbeck, 1923 - Ctenulus) +

DITAENIELLA Sack, 1939
grisescens (Meigen, 1830 - Sciomyza) +
nasuta (Zetterstedt, 1846 - Sciomyza)

PHERBELLIA Robineau-Desvoidy, 1830
MELINA Robineau-Desvoidy, 1830, preocc.

Subgenus **CHETOCERA** Hendel, 1902
albocostata (Fallén, 1820 - Sciomyza) +
annulipes (Zetterstedt, 1846 - Sciomyza)
dorsata (Zetterstedt, 1846 - Sciomyza) +
dubia (Fallén, 1820 - Sciomyza) +
griseola (Fallén, 1820 - Sciomyza) +
fuscipes (Macquart, 1835 - Sciomyza)
ruficeps (Zetterstedt, 1846 - Sciomyza)
nana (Fallén, 1820 - Sciomyza) +
pallidiventris (Fallén, 1820 - Sciomyza) +
rozkosnyi Verbeke, 1967 +
scutellaris (von Roser, 1840 - Sciomyza) +
pallidicarpa (Rondani, 1868 - Sciomyza)
sordida (Hendel, 1902 - Sciomyza)
ventralis (Fallén, 1820 - Sciomyza) +

Subgenus **DITAENIA** Hendel, 1902
cinerella (Fallén, 1820 - Sciomyza) +

Subgenus **OXYTAENIA** Sack, 1939, preocc.
brunnipes (Meigen, 1838 - Sciomyza) +
pusilla (Zetterstedt, 1838 - Sciomyza)
knutsoni Verbeke, 1967 +
stackelbergi Elberg, 1965 ++

Subgenus **PHERBELLIA** sensu stricto
schoenherri (Fallén, 1826 - Sciomyza) +
punctata (Fabricius, 1794 - Musca), preocc.
monilis (Meigen, 1830 - Sciomyza)

Unplaced to subgenus
argyra Verbeke, 1967 +
obtusa: authors, misident.
goberti (Pandellé, 1902 - Sciomyza)
stylifera Rozkošný, 1982

PTEROMICRA Lioy, 1864
DICHROCHIRA Hendel, 1902
angustipennis (Staeger, 1845 - Sciomyza) +
glabricula: authors, misident.
glabricula (Fallén, 1820 - Sciomyza) +
nigrimana (Meigen, 1830 - Sciomyza
leucopeza (Meigen, 1830 - Sciomyza) +
pectorosa (Hendel, 1902 - Dichrochira) +

SCIOMYZA Fallén, 1820
BISCHOFIA Hendel, 1902
dryomyzina Zetterstedt, 1846 +
simplex Fallén, 1820
testacea Macquart, 1835

TETANURA Fallén, 1820
pallidiventris Fallén, 1820 +
bicolor (Curtis, 1831 - Tanypeza), nom. nudum

Tetanocerini

ANTICHETA Haliday, 1838
ANTICHAETA Agassiz, 1846, emend.
HETEROPTERYX Hendel, 1902, preocc.
HEMITELOPTERYX Cresson, 1920
analis (Meigen, 1830 - Sciomyza) +
vittata (Curtis, 1831 - Tetanocera), nom. nudum
vittata (Haliday, 1833 - Tetanocera)
media (Haliday in Curtis, 1837 - Tetanocera), unavlble
atriseta (Loew, 1849 - Sciomyza)
brevipennis (Zetterstedt, 1846 - Sciomyza) +
obliviosa Enderlein, 1939

COREMACERA Rondani, 1856
STATINIA Meigen, 1800, suppr.
marginata (Fabricius, 1775 - Musca) +
tristis (Harris, 1780 - Musca), preocc.

DICHETOPHORA Rondani, 1868
finlandica Verbeke, 1964
obliterata: Sack, 1939, misident.
obliterata (Fabricius, 1805 - Scatophaga)
ichneumonea (Robineau-Desvoidy, 1830 - Chione)
gracilis (Loew, 1845 - Tetanocera)

DICTYA Meigen, 1803
MONOCHAETOPHORA Hendel, 1900
umbrarum (Linnaeus, 1758 - Musca) +

ECTINOCERA Zetterstedt, 1838
borealis Zetterstedt, 1838
vicaria Pokorny, 1887

ELGIVA Meigen, 1838
cucularia (Linnaeus, 1767 - Musca) +
solicita (Harris, 1780 - Musca) +
rufa (Panzer, 1798 - Musca), preocc.
sundewalli Kloet & Hincks, 1945

EUTHYCERA Latreille, 1829
fumigata (Scopoli, 1763 - Musca)
rufifrons (Fabricius, 1781 - Musca)

HYDROMYA Robineau-Desvoidy, 1830
HYDROMYIA Agassiz, 1847, emend.
dorsalis (Fabricius, 1775 - Musca) +

ILIONE Haliday in Curtis, 1837
CHIONE Robineau-Desvoidy, 1830, preocc.
ILIONE Haliday in Westwood, 1840

Subgenus **ILIONE** sensu stricto
albiseta (Scopoli, 1763 - Musca) +
aratoria (Fabricius, 1794 - Musca)
crocus (Harris, 1780 - Musca
ustulata (Stephens, 1829 - Tetanocera), unavlbl

Subgenus **KNUTSONIA** Verbeke, 1964
TUMIDICERCUS Knutson & Berg, 1967
lineata (Fallén, 1820 - Tetanocera) +

LIMNIA Robineau-Desvoidy, 1830
paludicola Elberg, 1965 +
unguicornis (Scopoli, 1763 - Musca) +
varicus (Harris, 1780: 115 - Musca), preocc.
varieus (Harris, 1780 - Musca), error in index
pratorum (Fallén, 1820 - Tetanocera)

PHERBINA Robineau-Desvoidy, 1830
coryleti (Scopoli, 1763 - Musca) +
reticulata (Fabricius, 1781 - Musca)

PSACADINA Enderlein, 1939
VERBEKEA Mayer, 1953
verbekei Rozkošný in Knutson, *et al*. 1975 +
punctata: authors, misident.
vittigera (Schiner, 1864 - Tetanocera)
zernyi (Mayer, 1953 - Pherbina) +

RENOCERA Hendel, 1900
pallida (Fallén, 1820 - Sciomyza) +
striata (Meigen, 1830 - Sciomyza) +
affinis (Zetterstedt, 1846 - Sciomyza)
stroblii Hendel, 1900 +
fuscinervis: authors, misident.

SEPEDON Latreille, 1804
sphegea (Fabricius, 1775 - Syrphus) +
palustris Latreille, 1809
simulator (Harris, 1780: 152 - Musca), preocc
spinipes (Scopoli, 1763 - Musca) +
haeffneri Fallén, 1820

TETANOCERA Duméril, 1800
THAIS Haliday in Curtis, 1837, preocc., unavlbl
THAIS Haliday in Westwood, 1840, preocc.

Subgenus **CHAETOTETANOCERA** Mayer, 1953
robusta Loew, 1847 +

Subgenus **TETANOCERA** sensu stricto
arrogans Meigen, 1830 +
foveolata Rondani, 1868
elata (Fabricius, 1781 - Musca) +
nigricosta Rondani, 1868
ferruginea Fallén, 1820 +
freyi Stackelberg, 1963 +
fuscinervis (Zetterstedt, 1838 - Sciomyza) +
unicolor Loew, 1847
hyalipennis von Roser, 1840 +
laevifrons Loew, 1847
montana Day, 1881 +
phyllophora Melander, 1920 +
nigricosta: Séguy, 1934, misident.
elegans Collin, 1960
punctifrons Rondani, 1868
silvatica Meigen, 1830

TRYPETOPTERA Hendel, 1900
punctulata (Scopoli, 1763 - Musca) +
hieracii (Fabricius, 1775 - Musca)

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