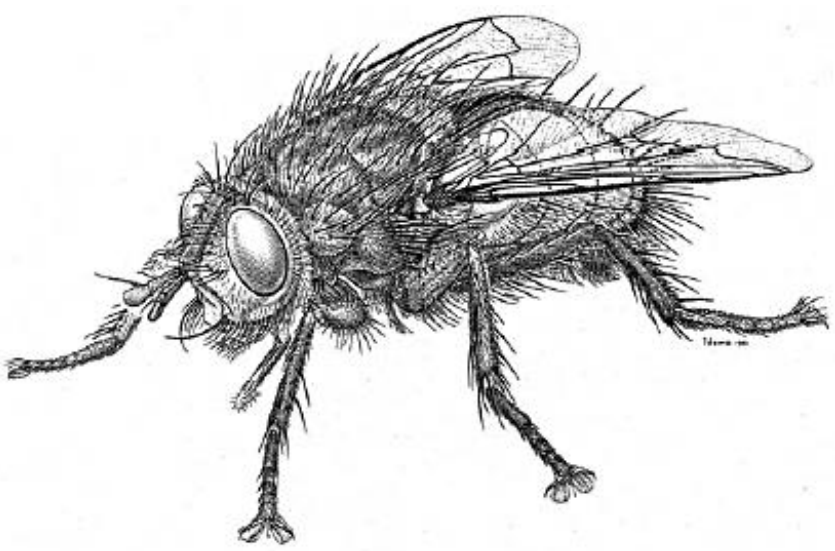
Introduction to the families of British Diptera

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modified by John and Barbara Ismay February 2015

Part 3: Description of families



March 2008

DipteristsForum
www.dipteristsforum.org.uk

Introduction

The following information is given about each family:

Number of British species

This is the number of species listed in the latest checklist (Chandler, 1998) and the subsequent updates which have been published in *Dipterists Digest*.

Size

Grouped into four categories according to the approximate body length.

T	Tiny	less than 2mm
S	Small	2-5 mm
M	Medium	5-10 mm
L	Large	more than 10 mm

Difficulty

An attempt to convey the ease or difficulty of identification. This is necessarily subjective and depends largely upon your previous experience.

1	Easy to moderate. No more difficult than most hoverflies. Good keys available.
2	Good families to move on to for those with experience of group 1. Only a small proportion of difficult species and genera. If genital characters are needed, they are easily seen providing the genitalia are hinged out (e.g. hoverfly genus *Sphaerophoria*). Keys available, but they may be older and require supplementing with other, more recent, literature.
3	Can be tackled successfully given care and experience, but are quite taxing. Normally require access to a microscope and accurate species identification often requires genitalia preparation. Keys may not be available or are out of date, so access to a range of supplementary literature is necessary.
4	Require considerable experience and a good microscope. Microscopic preparations of genitalia, and perhaps other features, are essential. Access to voucher collections and a good library also necessary.
5	Impossible for all practical purposes due to taxonomic difficulties and/or lack of recent keys.

Help that is available with identification.

Scheme	Family covered by a recording scheme
Study group	Family covered by a study group that may issue test keys, newsletters, etc., from time to time and can provide assistance with identification
Panel	Dipterists Forum Advisory Panel: The Forum has members who are prepared to offer assistance. They should be contacted in the first instance before sending unsolicited material!

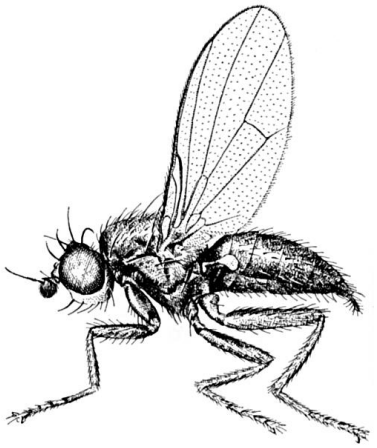
Acartophthalmidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Opomyzoidea
Number of British species: 2 **Size:** T **Difficulty:** 3

Characters: Minute to small (1-2.5 mm), brownish grey flies. Arista pubescent, ocelli present; Ocellar bristles present; Postvertical bristles strong, far apart, diverging; 3 pairs of frontal bristles, curving obliquely out-backward, increasing in size, the upper pair the largest; scattered interfrontal setulae present; vibrissae absent but with a series of strong bristles near the vibrissal angle. Wing unmarked or tinged along costa; costa with a humeral break only; vein Sc complete; crossvein BM-Cu present; cell cup closed. Tibiae without dorsal preapical bristle.

Biology: The larvae of this small family are presumed to feed on rotting organic matter. The adults appear to inhabit woodland and are found on rotting bracket fungi and mushrooms, decaying wood, droppings and carrion; deposition of eggs on a dead snail and carrion has been observed.

Identification: Czerny (1928), Séguy (1934)



Arctophthalmus nigrinus female

Acroceridae

Hunchback-flies

BRACHYCERA, Asilomorpha, Nemestrinoidea
Number of British species: 3 **Size:** S **Difficulty:** 1 Scheme

Characters: Small (3.5-7.5mm). These flies are easily recognised by their small head situated almost below the hunchbacked thorax, the large earshaped lower calypter and large abdomen. Body colour dull or lustrous, usually black with white, yellow, or orange markings on thorax and abdomen. The small head largely occupied by the relatively large eyes, holoptic in both sexes. Wing clear or tinged; venation varying from complete to strongly reduced. Legs simple, femora sometimes swollen; empodium pulvilliform.

Biology: The larvae are endoparasitoids of spiders, usually one larva per spider, rarely two or more. The spider continues functioning normally until just prior to completion of the fourth instar. At the end of this stage the spider is largely eaten and the larva pupates outside the spider in the web the spider has woven at the very last. There are apparently no fixed host-parasitoid relationships at the species level. Adults may more or less abound locally but apart from species visiting flowers and feeding on nectar, they are rarely observed. They are mainly active on warm sunny days. Males may sometimes gather in large numbers at higher points in the landscape (hilltopping). Mating takes place in flight.

Identification: Drake (1991), Oldroyd (1969), Stubbs & Drake (2001)



Ogcodes gibbosus

Agromyzidae

Leaf-miner Flies

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Opomyzoidea
Number of British species: 373 Size: T–S Difficulty: 3–4 Panel



Phytomyza horticola



Mines of *Phytomyza illicis*, the Holly leaf miner

Characters: Minute to medium sized (1-6 mm) flies, varying in colour from all yellow to black to metallic green. Arista bare to pubescent; ocelli present; Ocellar bristles present; Postvertical bristles diverging; 2-8 pairs of frontal bristles, the lower 1-3 pairs curving inward, the other pairs backward; interfrontal bristles absent; interfrontal setulae sometimes present; vibrissae present but in some cases weak. Wing unmarked; costa with subcostal break; vein Sc complete or incomplete, apically ending in vein R_1 (Agromyzinae) or separate from vein R_1 but reduced to a fold that may or may not reach the costa (Phytomyzinae); crossvein BM-Cu present; cell cup closed. Tibiae without dorsal preapical bristle. Female with oviscape, non retractable basal segment of the ovipositor.

Biology: The larvae are mining, generally in the stalks or leaves of herbs, sometimes in roots, seeds or under bark. In the few species living on woody plants this may lead to gall formation. Most species are more or less host specific and several species cause damage to economically important plants. The shape of the mine is often characteristic of the species and therefore useful for identification. Adults occur in a variety of habitats, depending on the larval host plants.

Identification: Bland (1993), Bland (1995), Bland (1997), Bland (2000), Bland & Tschirnhaus (1998), Bland *et al.* (1999), Cole (1998), Deeming (1995), Deeming (1999), Gibbs (2002), Godfray (1985), Henshaw (2002), Irwin (1985b), McLean (1981), Spencer (1972), Spencer (1976), Spencer (1990), Spencer & Martinez (1987), Stubbs (2000)

Anisopodidae

Window-gnats

NEMATOCERA, Psychodomorpha, Anisopodoidea
Number of British species: 4 **Size:** M **Difficulty:** 2–3



Sylvicola spp. on a sap run

Characters: Small to large (4-12 mm), yellowish to brownish Nematocera with slender antennae and abdomen. Head small and rounded; mouthparts small; ocelli present; eyes dichoptic or holoptic; antenna with 16 segments varying from relatively short to longer than head and thorax together. Wing wide, with clear anal lobe and a pattern of smaller markings. Legs slender, relatively long; tibiae with apical spurs.

Biology: The larvae live in, and feed on, all sorts of rotting and decomposing material like droppings, dung, vegetables, dying wood, cracks and fissures in trees filled with organic matter, bark, bracket fungi and mushrooms, leaves, roots, sap exuding from tree wounds and other liquids rich in organic matter. The adults are encountered mainly in summer in woodland, meadows, gardens, etc. They are found near the larval habitats, visiting flowers, near sap exuding from tree wounds, and are regularly seen on windows, both indoors and outside, or other vertical surfaces such as tree trunks, walls, etc. Males form swarms to attract females for mating.

Identification: Coe *et al.* (1950), Hancock (1989)

Anthomyiidae

BRACHYCERA, Muscomorpha Schizophora Calyptratae, Muscoidea
Number of British species: 238 **Size:** S–M **Difficulty:** 2–4 Study group


Eustalomyia

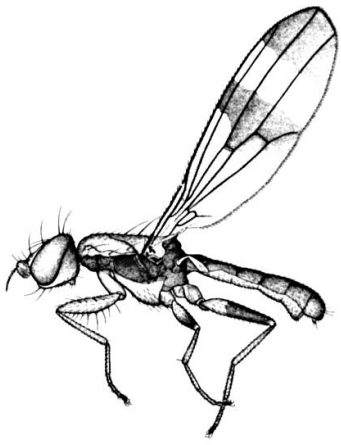
Characters: Small to large (4-12 mm), slender flies, usually coloured brownish, greyish or blackish, sometimes yellowish or with a distinct pattern on thorax and abdomen, never metallic lustrous. Arista bare to plumose; female often with interfrontal bristles. Wing generally clear, sometimes tinged, rarely marked; venation virtually always with straight vein M_1 and long anal vein. Scutellum underneath in the middle usually with a patch of fine, pale hairs. Meron devoid of bristles near hind margin.

Biology: The larvae of many genera are phytophagous, some of which are leaf miners. At the same time many species are saprophagous in diverse habitats (dung, nests of birds, etc.). Phytophagous species can be of economic importance, like various species of *Delia* causing damage to onions beans and other vegetables. Some species are saprophagous, or with larvae living in mushrooms or as parasitoids of insects. The larvae of *Fucellia* live at the coast in rotting organic matter washed up by the sea. The adults visit flowers but can be found on exuding tree sap and on dung, carrion, rotting plants, etc.

Identification: Ackland (1989), Ackland (1993a), Ackland (Unpublished), Ackland & Michelsen (1987), Ackland & Pont (1996), Bland & Ackland (2000), Hennig (1966-1976), Michelsen (1980), Michelsen (1988)

Anthomyzidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Opomyzoidea
Number of British species: 19 **Size:** S **Difficulty:** 3 Panel


Typhamyza bifasciata male

Characters: Minute to small (1.3-4.5 mm), slender flies, yellow to black sometimes with dark spots or stripes; wing usually long and narrow. Arista pubescent or with longer rays; ocelli present; Ocellar bristles present; Postvertical bristles small, converging, rarely absent; 2-3 pairs of frontal bristles, curving backward, usually preceded by 1 or more weaker bristles; interfrontal bristles absent or present; vibrissae present. Wing usually clear, sometimes marked; vein C with subcostal break; vein Sc incomplete; crossvein BM-Cu present but sometimes not complete; cell cup closed, rarely open. Some genera, including the more common *Anthomyza* and *Paranthomyza,* with femur of fore leg with a short spine on the ventral side, beyond the middle; tibiae without dorsal preapical bristle.

Biology: The larvae of most species develop in the stems and leaf sheaths of grasses and plants in marsh habitats such as species of *Typha, Juncus, Carex* and *Scirpus* without causing much damage; several species are known to mine in dicotyledons whereas others live in dead plants or as inquilines in existing galls. Adults of most species are usually found in moist habitats, both shaded and in the open such as damp meadows, marshes, bogs and damp deciduous or mixed forests with rich undergrowth; a preference for more dryer habitats such as dry grasslands is shown by some species of *Anthomyza* and the brachypterous *Stiphrosoma sabulosum* (Haliday).

Identification: Andersson (1976a), Andersson (1984), Collin (1944b), Roháček (1984b), Roháček (1986), Roháček (1992), Roháček (1996),

Roháček (1998), Roháček (1999)

Asilidae

Robber-flies

BRACHYCERA, Asilomorpha, Asiloidea
Number of British species: 29 **Size:** M–L **Difficulty:** 1–2 Scheme

Characters: Small (3 mm) to very large (50 mm), but generally medium sized to large (8-20 mm) flies, varying in shape from long and slender to short and stout. The colour of the body and pubescence are variable from dark metallic lustrous to paler, with orange or yellow markings on body and wings, or resembling bees and wasps. Head dorsally concave in between the large, dichoptic eyes; ocelli implanted on an elevation between the eyes; antenna variable, third segment elongate, usually followed by 1 or 2 segment(s) which may, or may not, constitute an arista or style; face relatively long and nearly always with a distinct facial knob bearing long bristles, named the mystax or beard; mouthparts powerful and piercing. Wing usually clear, in some cases completely or partially tinged or darkened; cell m_3 and cell cup open or closed. Legs long and powerful, often armed with strong bristles; tibiae with apical bristles or spurs; empodium bristle-like or absent.



The Dune robber-fly *Philonicus albiceps* feeding on a grasshopper

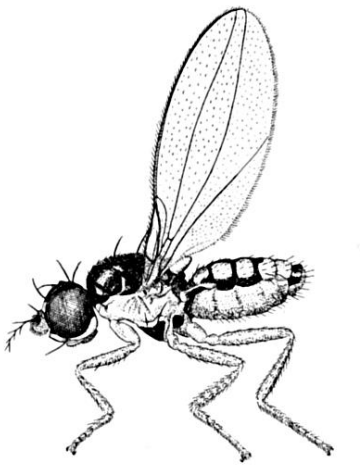
Biology: The larvae live in the soil and in decaying wood; as far as known they largely feed on the larvae of other insects. The adults are predators as well. Most species prefer open, sunny habitats and are mainly active during the warmest part of the day. They are able fliers that catch their prey - mainly other insects - on the wing. They are often seen on lookout posts like walls, branches and leaves, or on the ground, surveying their surroundings for possible prey flying by.

Identification: Drake (1991), Oldroyd (1969), Stubbs & Drake (2001)

Asteiidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Opomyzoidea
Number of British species: 7 **Size:** S **Difficulty:** 2–3

Characters: Minute to small (1-3 mm), delicate, often weakly sclerotized flies with yellow-black or dark colours, male almost always with distinct interfrontal stripes. Arista sometimes bare or pubescent but usually with a characteristic zigzag of longer or shorter alternating rays; Ocelli present Ocellar bristles present or absent; Postvertical bristles weak, parallel, diverging or absent; 0-2 pairs of frontal bristles, if present, curving forward or backward; interfrontal bristles sometimes present immediately above the antennae; scattered interfrontal setulae present; vibrissae absent to present. Wing unmarked; costa continuous; vein Sc incomplete; crossvein BM-Cu and cell cup absent. Tibiae without dorsal preapical bristle.



Asteia amoena female

Biology: The larvae have been found under the bark of trees and have been reared from flower heads (inflorescences) and rotting or dry organic matter; larvae of *Leiomyza* have been associated with fungi. The adults are often found on flowers, on low vegetation, near sap exuding from tree wounds, and relatively often on windows indoors, or in case of one genus *(Leiomyza)* near or on mushrooms and bracket fungi in shaded places. Adults of the species *Astiosoma rufifrons* Duda is attracted to wood ash after bonfires especially during the evening.

Identification: Chandler (1978a)

Atelestidae

BRACHYCERA, Asilomorpha, Empidoidea
Number of British species: 2 **Size:** S **Difficulty:** 2 Scheme

Characters: Minute to small (1.5-2.75 mm), black flies. Head rather small; eyes big, holoptic in male; third antennal segment with an arista of 1-3 times its own length; mouthparts relatively short, directed forward or somewhat down. Wing clear or tinged, with a stigma spot between apex of veins Sc and R_1, stigma spot sometimes indistinct; cell dm absent and vein M not forked*;* cell cup normally larger than cells br and bm, if not then CuA_2 convex and anal vein arched to wing margin; alula and large anal lobe usually present. Tibia of hind leg, and in some cases first tarsal segment as well, sometimes dilated and laterally compressed.

Biology: The biology of this small family is little known. The larvae are unknown. Adults of *Atelestus* mainly occur in grassland or patches of herbs or on leaves in deciduous woodlands, often near water. Both sexes fly in swarms. Because of the anatomy of their mouthparts, the adults are presumed to be flower visitors.

Identification: Chvála (1983), Collin (1961), Drake (1991)



Atelestus pulicarius male

Athericidae

Water Snipe-flies

BRACHYCERA, Tabanomorpha, Tabanoidea
Number of British species: 3 **Size:** L **Difficulty:** 1 Scheme

Characters: Medium sized (7.5-10 mm), brownish to black flies, usually with banded markings on the abdomen. Body densely set with short erect bristles. Ocelli present; eyes in male nearly holoptic, in female dichoptic; antenna short, third segment reniform; mouthparts powerful, at most as long as the height of the head. Wing long and wide, often with dark markings; veins R_1 and R_{2+3} ending in the costa at the same point; cell m_3 open; cell cup closed; legs relatively long; tibiae of mid and hind legs with apical spurs; empodium pulvilliform.

Biology: The larvae are aquatic and prey on larvae of other water insects. Prior to pupation, they move to nearby land. Adults are always encountered near running water, usually on the vegetation close by. Eggs are deposited in suitable spots over the water, such as bridges and overhanging branches. In some species, all females deposit their eggs together before they die. These clusters of eggs and dead flies may include up to several tens of thousands of females. The adults largely feed on nectar but some species feed on blood of humans and cattle.

Identification: Drake (1991), Oldroyd (1969), Stubbs & Drake (2001)



Atherix ibis



Egg laying cluster of (dead) females on a hawthorn branch overhanging a river.

Aulacigastridae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Opomyzoidea
Number of British species: 1 **Size:** S **Difficulty:** 2

Characters: Small (2-5 mm), mainly dark coloured flies with an extensive grey pruinosity, pale tarsi and red eyes. Arista pubescent or with longer rays; ocelli present; Ocellar bristles reduced or absent; Postvertical bristles absent; 2 pairs of frontal bristles, the lower pair curving forward and slightly inward, the upper pair backward and further from the eye margin than the lower pair; interfrontal bristles absent; vibrissae present. Wing clear; costa with humeral and subcostal breaks; vein Sc thin but complete, veins Sc and R_1 reaching the costa separately, but just before they merge for a short distance or touch each other, apical part of vein Sc more pallid; crossvein BM-Cu absent; cell cup closed. Tibiae without dorsal preapical bristle.


Aulacigaster leucopeza male

Biology: The larvae of Aulacigaster live in sap exuding from wounds in deciduous and coniferous trees, where they feed on micro-organisms. The adults are usually found near the larval sites but are also attracted to other fermenting fluids or substrates; they are known to hibernate in sheltered places in forests.

Identification: Séguy (1934)

Bibionidae

St Mark's Flies, Feverflies

NEMATOCERA, Bibionomorpha, Bibionoidea
Number of British species: 20 **Size:** S–L **Difficulty:** 1–3

Characters: Small to large (2-15 mm), robustly built Nematocera. Usually densely set with fine hairs; body colour pale brown to black, in some cases (partially) red or yellow. Ocelli conspicuous; in male eyes holoptic and consisting of two separate parts, in female eyes dichoptic and simple; antenna inserted rather low, with 6-12 segments. Wing wide, with distinct anal lobe; wing clear or darkened. Tibia of fore leg usually swollen, in *Bibio* with a long, stout spur and an apical projection; in *Dilophus* with several rows of short, stout spurs.


Bibio johannis male on a daisy flower

Biology: The larvae are largely found in the topsoil of moist grasslands and woodland and in decaying wood. They appear to feed mainly on rotting plant matter; in some cases also on living roots or stems, thereby causing damage to valuable crops that can be substantial if they are present in large numbers. Densities up to 37,000 larvae per square metre have been recorded. The adults are mainly found in spring, usually present for only a few weeks every year, sometimes in very large numbers. The males often fly or hover together in swarms. The adults, those of *Dilophus* in particular, often visit flowers as well.

Identification: Freeman & Lane (1985)

Bolitophilidae

NEMATOCERA, Bibionomorpha, Sciaroidea
Number of British species: 16 **Size:** S **Difficulty:** 3 Scheme

Characters: Small to medium sized (4-7 mm), delicate, greyish brown Nematocera with long, slender legs and abdomen and a characteristic wing venation (e.g. basal position of crossvein BM-Cu). Head and eyes small; ocelli present; antenna conspicuously long and slender, sometimes with long verticils. Thorax much vaulted. Wing clear or with banded markings along the crossveins; anal lobe weak or absent. Coxae elongate; tibiae with apical bristles or spurs.



Bolitophila cinerea female

Biology. The biology of this small family is little known. The larvae all develop in terrestrial mushrooms. The adults are mainly found in moist surroundings and alongside water in well wooded areas.

Identification: Chandler (1978b), Chandler (1987b), Chandler (1992b), Edwards (1913), Edwards (1925), Edwards (1941), Hutson *et al.* (1980)

Bombyliidae

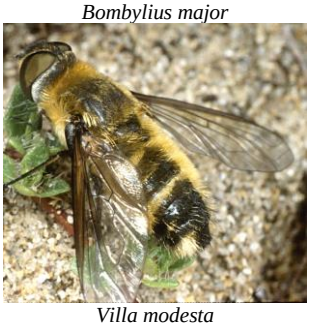
Bee-flies

BRACHYCERA, Asilomorpha, Asiloidea
Number of British species: 9 **Size:** S–L **Difficulty:** 1 Scheme

Characters: Small to large (3-14 mm) flies, often thorax and abdomen covered with fine hairs or in part scale-like hairs. Body usually broad, bee-like but sometimes slender; colour brown, grey, black or with a conspicuous pattern of contrasting colours; in some cases the body is devoid of hair covering and shining. Eyes large, male often holoptic; antenna with 3-4 segments, the third segment largest and the fourth making up the flagellum, there may also be a very small transparent style. Mouthparts without (*Thyridanthrax*, *Villa)* or with (*Bombylius*, *Pthiria*) a long, sucking proboscis. Wing occasionally clear but most often with a conspicuous pattern; veins R_{2+3} and R_4 often strongly curving forward; cell below discal cell (cell cua_1 open; cell cup usually open; wings held horizontally when at rest. Legs long and slender; tibiae with apical bristles or (rarely on mid leg) spurs; empodium bristle-like or absent.



Bombylius major



Villa modesta

Biology: The larvae are parasitoids or predators of eggs, larvae and pupae of other insects. *Bombylius* parasitise bees in which case the female deposits her eggs in or near the nest of the bees. The first instar enters the nest and feeds on the contents of the cells, including the bee larvae. *Thyridanthrax* parasitise solitary wasps and *Pthiria* and *Villa* probably Lepidopterous larvae and pupae. Adults usually feed on nectar and the females on pollen. Bombyliidae are generally good fliers and many are able to hover at the same spot in front of a flower in order to feed while hovering. Species not possessing a long proboscis often settle on the flowers themselves. The adults are mainly active on warm, sunny days and prefer open, dry habitats.

Identification: Drake (1991), Oldroyd (1969), Stubbs & Drake (2001)

Borboropsidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Sphaeroceroidea
Number of British species: 1 **Size:** T **Difficulty:** 3

Characters: Minute to small, two pairs of strong frontal bristles, arista bare or with very short hairs, ocellar bristles very long and placed just on the ocellar triangle, postvertical bristles small and crossed. Tibiae without dorsal preapical bristle. Costa without stronger bristles, anal vein extending to wing margin.

Biology: Unknown.

Identification: Collin (1943b)



Borboropsis puberula

Braulidae

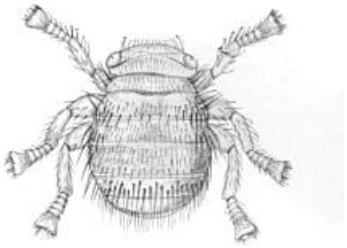
Beelice

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Carnoidea
Number of British species: 2 **Size:** T **Difficulty:** 3

Characters: Minute to small (1.2-2.5 mm), dorsoventrally flattened reddish to dark brown flies, with the body evenly covered by rather long bristles. Wings, halteres and scutellum absent. Eyes reduced to a pale spot just behind the sunken antenna; ocelli absent. Thorax small, closely adpressed to the abdomen. Legs relatively long and strong; tarsal claws transformed into a comb of over 20 teeth, curving inward.

Biology: The larvae and adults live as commensals in the nests of bees. The larvae feed on honey, pollen and organic debris. The adults attach themselves to the body of the queen (rarely of a worker), absorbing food and liquids from the mouth opening of the bee. The only species of importance to bee-keeping is *Braula coeca* Nitzsch. It was not a real nuisance but nevertheless has disappeared from many countries on account of measures taken against *Varroa* mites which cause severe damage in beehives.

Identification: Dobson (1999), Imms (1942)



Braula

Calliphoridae

Bluebottles, Greenbottles, Blowflies

BRACHYCERA, Muscomorpha Schizophora Calyptratae, Oestroidea
Number of British species: 38 **Size:** S–L **Difficulty:** 2–3 Panel

Characters: The family most probably does not represent a natural systematic grouping and hence is not easy to characterise unequivocally. It includes small to large (4-16 mm), usually robust flies. Many species have a greenish or bluish metallic lustre with some silvery, yellowish, or golden pruinosity in a variable pattern in some species the body colour is greenish yellow, polished black, occasionally without metallic sheen. Head, body and legs often with strong bristles, in *Pollenia* thorax clothed with yellow curly hairs. Arista usually long plumose in at least the basal two-thirds, rarely pubescent. The shape of the lower calypter is strongly variable, ranging from well rounded-triangular to elliptic; wing always with vein M_1 curving forward; cell r_{4+5} open or closed at the wing margin rarely with a very short petiole. Meral bristles always present and subscutellum distinctly absent, that is, the part below the scutellum is flat, not convex; it is usually separated from the scutellum by a membranous



Calliphora

part; posterior spiracle covered by an anterior and posterior lappet, usually of unequal size with the posterior lappet usually forming an operculum.



Lucilia

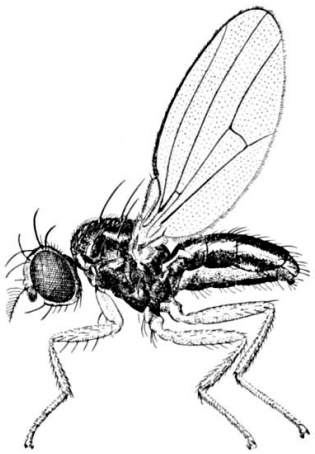
Biology: Many species develop in carrion of various origin. Eggs are frequently deposited on dead vertebrates making some calliphorids important in forensic entomology. The larvae can be: true obligate agents of myiasis in vertebrate animals (e.g. *Lucilia bufonivora* Moniez on amphibia) and humans *(Dermatobia,* in the Tropics); necrophagous to facultative agents of myiasis *(Calliphora, Cynomya, Lucilia,* e.g. *L. sericata* (Meigen) in sheep, *Phormia, Protophormia);* parasites of earthworms and other worms *(Bellardia, Onesia,* Polleniinae), snails and slugs *(Angioneura, Eurychaeta, Melinda, Melanomya),* or egg clusters of grasshoppers *(Stomorhina);* or parasites sucking blood from bird nestlings *(Protocalliphora).* The adults are often found on flowers, plant detritus, carrion and dung. Two species, *Pollenia rudis* (Fabricius) and *Protophormia terraenovae* (Robineau-Desvoidy) sometimes occur indoors in large numbers, looking for a shelter to survive the winter.

Identification: Emden (1954), Rognes (1991), Rotheray *et al.* (1998)

Camillidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Ephydroidea
Number of British species: 5 **Size:** S **Difficulty:** 4

Characters: Small (2-3.5 mm), slender, dark and lustrous flies. Arista with long rays above and shorter rays below; ocelli present; Ocellar bristles present; Postvertical bristles converging; 2 pairs of frontal bristles, the lower pair curving forward, the upper pair backward; scattered interfrontal setulae present; vibrissae present. Wing unmarked; costa with both humeral and subcostal breaks; vein Sc incomplete; crossvein BM-Cu absent; cell cup open. Femur of fore leg with a spine on its ventral side, beyond the middle; only tibia of mid leg with dorsal preapical bristle.



Camilla glabrata female

Biology: The biology of this small family is little known. Presumably the larvae feed on organic matter (dung and detritus); they have been collected in soil at the entrances of rabbit burrows and in the nest of a field vole *(Microtus agrestis* (Linnaeus)). The adults are frequently found on flowers, on low vegetation or on bare soil, near the entrance of burrows, and are often found on windows.

Identification: Collin (1933), Papp (1982), Papp (1985)

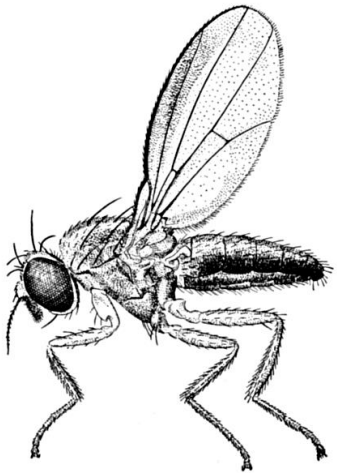
Campichoetidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Ephydroidea
Number of British species: 2 **Size:** S **Difficulty:** 2

Characters: Small (2.5-4 mm) flies, body colour dark with head and legs partially yellow. Arista short pubescent to moderately plumose; ocelli present; Ocellar bristles present; Postvertical bristles converging; 2-3 pairs of frontal bristles, 1 pair curving forward, the other pair(s) backward; interfrontal bristles absent; vibrissae present. Wing partially tinged, in particular along the costa and with a central pale spot, or wing completely tinged brownish to greyish; costa with a subcostal break; vein Sc incomplete; crossvein BM-Cu present; cell cup closed. Tibiae with dorsal preapical bristle.

Biology: The larvae belonging to this family are unknown; they have been suggested to be saprophagous in rotten wood but this has not been confirmed. The adults are found on low vegetation in woodland areas; *Campichoeta* is found in moist woodlands in particular.

Identification: Chandler (1986), Chandler (1987a)



Campichoeta punctum male

Canacidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Carnoidea
Number of British species: 2 **Size:** S **Difficulty:** 2

Characters: Minute to small (1.6-5 mm), robust, yellow to greyish black, pruinose flies, generally with conspicuous whitish to greyish markings. Head large with small antenna; arista bare to pubescent; ocelli present; Ocellar bristles present; Postvertical bristles absent but often replaced by diverging pseudopostocellar bristles; 2-5 pairs of frontal bristles, curving outward; interfrontal bristles present; gena with 1 or more upcurved bristles; vibrissae present. Wing unmarked; costa with a subcostal break; vein Sc parallel to vein R_1 and merging with that vein just before the costa; crossvein BM-Cu present; cell cup closed. Tibiae without dorsal preapical bristle.

Biology: All the European species live in the tidal zone where they feed on algae and organic matter.

Identification: Canzoneri & Meneghini (1983), Wirth (1951)

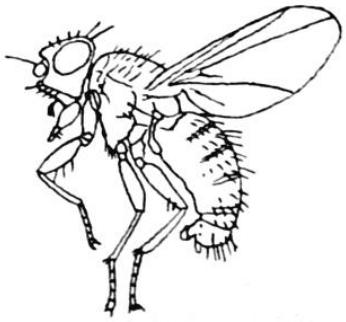


Xanthocanace ranula

Carnidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Carnoidea
Number of British species: 13 **Size:** T–S **Difficulty:** 3

Characters: Minute to small (1-2.5 mm), more or less lustrous black flies. Arista pubescent; ocelli present; Ocellar bristles present; Postvertical bristles diverging, parallel, converging, Postvertical bristles absent in *Carnus*; 4 pairs of frontal bristles, lower 2 pairs curving inward, upper 2 pairs obliquely out-backward; interfrontal bristles present; vibrissae present. Wing not marked; costa with both humeral and subcostal breaks; vein Sc incomplete; crossvein BM-Cu absent, crossvein DM-Cu absent in *Carnus;* cell cup open or absent, in *Carnus* the wing might be shed off near the base. Tibia without dorsal preapical bristle.



Carnus haemapterus male

Biology: The larvae of most species develop in all sorts of organic matter of animal origin, in particular in droppings and dung, carrion, and nests of birds; only a few species can develop in other decaying media, including rotten fungi or plant matter. Adults usually occur on or near the breeding substrates, but visit flowers as well, with a preference for umbellifers. The species of *Carnus* live exclusively in the nests of birds, especially those breeding in bushes, trees and in (tree)holes, where the larvae feed on nest debris. The adults emerge from the pupa with normal wings, fly about until they have found another suitable nest and then shed their wings. They attach themselves to the nestlings and feed on the flakes and moisture of their skin, and they are suspected to feed on blood as well.

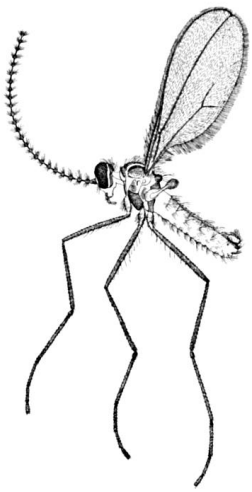
Identification: Collin (1930), Hennig (1937)

Cecidomyiidae

Gall-midges

NEMATOCERA, Bibionomorpha, Sciaroidea
Number of British species: 620 **Size:** T–S **Difficulty:** (1–)5

Characters: Minute to small (0.5-3 mm), rarely larger (up to 8 mm, wing length up to 15 mm), delicate Nematocera. Eyes holoptic with the exception of a few genera with reduced wings; mouthparts reduced; antenna in general conspicuously long, usually with 12-14 segments, sometimes less, sometimes more, up to 40; antennal segments bearing differently-shaped sensoria, in some Porricondylinae and in all Cecidomyiinae these are thread-like, in the supertribe Cecidomyiidi the sensoria (some or most) in the shape of long loops; ocelli present (in the Lestremiinae) or absent. Wing usually clear, in a few species with a pattern; number of longitudinal veins reduced; costa usually with a break just beyond vein R_5. Legs long, tibiae lacking apical bristles.



Contarinia tritici male

Biology: The larvae and adults can be found in a large array of habitats. Three main groups can be distinguished with respect to the feeding mode of the larvae:

1. larvae living in, and feeding on, mushrooms, bracket fungi, dying and decaying wood, or other organic substrates (soil, litter, plant remains, etc.);
2. larvae that cause damage to higher plants, either living free, in galls, or as leaf-miner;
3. larvae preying on invertebrates, in particular on (larvae of) small insects.

Of the three subfamilies, Lestremiinae, Porricondylinae and Cecidomyiinae, only representatives of the last cause the formation of

galls. Some species are of economic importance, because they cause damage to plants in agriculture and horticulture and others because of their use as biological control agents.

Identification: Barnes (1946-1956), Edwards (1938b), Harris (1966), Jaschhof (1998), Kieffer (1913), Mohn (1966-1971), Nijveldt (1969), Panelius (1965), Redfern & Shirley (2002), Stubbs (1986)



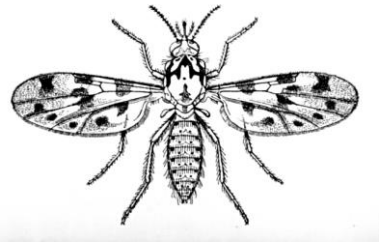
Galls of *Craneiobia corni* on dogwood

Ceratopogonidae

Biting-midges, No-see-ums

NEMATOCERA, Culicomorpha, Chironomoidea
Number of British species: 161 **Size:** T–S **Difficulty:** 3–4

Characters: Minute to small (1-5 mm), slender to robust, often dark coloured Nematocera, most capable of piercing (e.g. *Dasyhelea* not capable), allied to the Chironomidae, but less slender and with broader wings. Ocelli absent; antenna with 13-15 segments which in the male are more or less pubescent. Wing usually clear, in species of some genera with a pattern; usually the R-veins shortened enclosing 1 or 2 small cell(s), and more strongly developed than the other veins. Legs simple, sometimes with ventral spines on femora, especially of the fore leg, spines usually more developed in females.



Culicoides pulicarious female



Culicoides

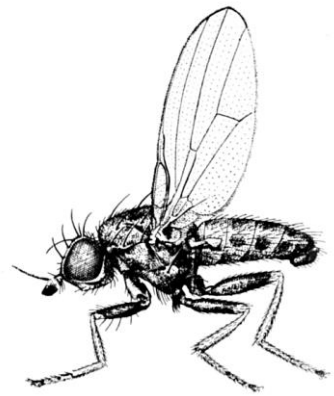
Biology: The larvae of most genera are aquatic, living in wells, brooks, rivers, lakes (recorded as deep as 43 metres below the surface), ponds, pools, water in rot holes in trees, in leaf axils and other small bodies of water with a high content of organic matter; in the foam at the surface of aquariums, etc.; larvae of some species are known from saline waters. Larvae of other genera inhabit more terrestrial habitats such as wet meadows, peat bogs, fenland moist soil, leaf litter, moss, e.g. *Sphagnum*, under tree bark, in rotting roots and bracket fungi, in exuding tree sap, in drying horse manure and cow dung, in ants nests. The larvae feed on a diversity of food sources; some feed on minute organic particles or micro-organisms, others are predators of insect larvae, worms and small invertebrates. The adults of most species are largely found at a distance from the larval habitats. Adults can occur in large numbers, in particular when evening approaches, but may be active at any time of day in still, humid conditions. The males often fly in swarms. Adults of both sexes feed on flower nectar and honeydew. In some cases, e.g. *Dasyhelea*, this is the only food source, but usually the females feed on body fluids of insects; those of *Culicoides* and *Forcipomyia (Lasiohelea)* feeding on the blood of mammals including humans. This blood serves as a source of protein for egg production. Despite their tiny size, man and animals alike can suffer substantially from "biting-midges", on account of vast numbers and because they can transmit diseases.

Identification: Boorman & Rowland (1988), Boorman (Unpublished), Borkent & Bissett (1990), Borkent & Grogan (1995), Campbell & Pelham-Clinton (1960), Edwards (1926), Edwards *et al.* (1939)

Chamaemyiidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Lauxanioidea
Number of British species: 32 **Size:** S **Difficulty:** 3–4 Panel

Characters: Minute to small (1-5 mm), usually silvery grey flies, in some cases with brown, grey or black markings on the head, thorax and abdomen. Arista bare to pubescent; ocelli present; Ocellar bristles present, in some cases curving backward, or absent. Postvertical bristles converging or reduced to absent; 0-3 pairs of frontal bristles, if present, curving backward; especially in the large genus *Leucopis* dorsal bristles of the head largely absent; scattered interfrontal setulae present; vibrissae present or absent, often a series of vibrissa-like bristles present. Wing unmarked, in some cases costal area darkened; costa continuous; vein Sc complete crossvein BM-Cu present; cell cup closed. Tibiae without dorsal preapical bristle.


Chamaemyia polistigma male

Biology: The larvae prey on aphids, scale insects and their allies, e.g. gall-building Psyllidae. Some species have been artificially introduced as biological control agents against pest woolly aphids especially in coniferous forests. The adults are found especially in grassland habitats and near the larvae where flies of e.g. the genus *Leucopis* feed on honeydew. The adults of this genus are able to walk sideways and backwards with ease, probably an adaptation enabling them to avoid the ants trying to chase off or kill everything that comes near 'their' aphids.

Identification: Collin (1966c), McAlpine (1971), McLean (1998), Smith (1963), Smith & McLean (1998), Tanasijtshuk (1986)

Chaoboridae

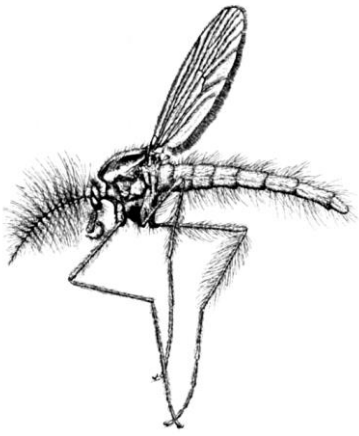
Phantom-midges

NEMATOCERA, Culicomorpha, Culicoidea
Number of British species: 6 **Size:** S **Difficulty:** 1–3

Characters: Small to medium sized (2-10 mm), delicate, pale yellow, brown or grey Nematocera, resembling mosquitoes (Culicidae). Antennae, wings, legs and abdomen long and slender. Ocelli absent; antenna always with 15 segments, plumose in the male; mouthparts protruding but much less than in mosquitoes. Upper part of thorax with few to many bristles but with 2 pairs of bare stripes. Wing narrow; venation as in Culicidae.


Phantom midge larva *Chaoborus*

Biology: Larvae with a remarkably transparent body, especially in *Chaoborus*, giving rise to the name of phantom larvae. They are aquatic and prey on small invertebrates. The larvae of *Mochlonyx* occur in temporary puddles, those of *Chaoborus* and *Mochlonyx* in various permanent standing waters (lakes, ponds, swamps, peat bogs, etc.). The adults are largely found near the larval habitats and often fly in swarms.


Chaoborus crystallinus male

Identification: Coe *et al.* (1950)

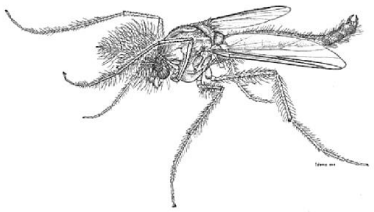
Chironomidae

Non-biting Midges

NEMATOCERA, Culicomorpha, Chironomoidea

Number of British species: 591 **Size:** T–M **Difficulty:** 3–4 Study group

Characters: Minute to medium sized (1-10 mm) Nematocera with long, slender wings, abdomen and legs. Ocelli absent; antenna generally with 13 to 17 segments with conspicuously long verticils in the male. Wing usually clear, in some cases with dark markings; anterior veins more strongly developed than posterior ones.



Adult male Chironomid

Biology: Notwithstanding a considerable number of species of which the larvae are terrestrial, the larvae of the majority of the species are aquatic or semi-aquatic. They inhabit a large array of habitats ranging from the pristine to the most severely polluted and including brackish, marine and saline habitats. The larvae feed on algae, small or larger particles of organic matter and on plankton; some are carnivorous (Tanypodinae and some others). The composition of the larval fauna is a major factor in ascertaining the quality of the water. The adults, likewise, occur in a wide range of habitats, largely those near water. In some cases, the males fly in conspicuously large swarms.

Identification: Coe *et al.* (1950), Cranston (1982), Langton (1991), Pinder (1978), Wiederholm (1983), Wiederholm (1986), Wiederholm (1989)

Chiropteromyzidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Sphaeroceroidea

Number of British species: 1 **Size:** T **Difficulty:** 3

Characters: Minute. Two pairs of frontal bristles, arista with very short hairs, ocellar very long and on line connecting ocelli. Costa without stronger bristles, subcosta fused with R_1 distally, anal vein not reaching wing margin. Dorsal preapical bristles indistinct on fore and hind tibiae.

Biology: The larvae are found in nests of birds.

Identification: Collin (1943b)

Chloropidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Carnoidea

Number of British species: 177 **Size:** T–S **Difficulty:** 2–4 Study group

Characters: Minute to medium sized (1-5 mm, sometimes up to *8* mm), stout to slender flies, usually with a conspicuously large ocellar triangle and few bristles. Often yellowish or greenish with black brown or red markings; sometimes body entirely or in part shining black or dusted grey. Arista bare to pubescent, the arista itself sometimes enlarged; ocelli present; Ocellar bristles present or reduced; Postvertical bristles parallel, converging or reduced; frontal bristles usually reduced, sometimes several forward, outward, or backward curved pairs present; dorsal region of head usually closely packed with smaller setulae; vibrissae present in some cases, usually reduced or absent. Proepisternum with a sharp anterior carina. Wing generally clear, in only a few species with a pattern; costa virtually always with a subcostal break; vein Sc incomplete; crossvein BM-Cu absent; vein CuA_1 usually with a flexure halfway cell bm + dm; often vein R_{4+5} and sometimes also vein M_1 curving toward the costa; cell cup open or absent. Tibiae without dorsal preapical bristle.



Meromyza saltatrix male

Biology: The larvae of the Chloropidae generally feed on living plant or animal tissues or on dead organic matter (insect frass, rotting plant material, mushrooms and bracket fungi, carrion, nests of birds etc.). Some feed on root aphids or on eggs of spiders and grasshoppers. Some woodland species live in decaying wood or below the bark of trees. Larvae feeding on vegetable material prefer the stems and flowers of grasses, reeds and sedges where they may cause galls; a number of these gall-forming species can cause damage to agriculture. The adults are encountered chiefly in open habitats such as meadows and marshland, although some species are typical of woodland. Several species visit flowers; from late summer onward *Thaumatomyia notata* (Meigen) may occur indoors, where it seeks refuge for the winter.

Identification: Andersson (1977), Beschovski & Lansbury (1987), Deeming (1980), Drake (1987), Ismay (1976), Ismay (1980), Ismay (1981a), Ismay (1981b), Ismay (1985), Ismay (1991), Ismay (1994a), Ismay (1999), Ismay (2000), Ismay (2001), Ismay & Perry (2002)



Aphanotrigonum trilineatum

Chyromyidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Sphaeroceroidea

Number of British species: 10 **Size:** S **Difficulty:** 3–4

Characters: Minute to medium sized (0.5 -8 mm), usually yellow to pallid flies with yellow bristles and hairs, in some cases with brown, grey or black markings on head, thorax and abdomen. Arista bare to pubescent; ocelli present; Ocellar bristles present; Postvertical bristles usually present, converging; 2-6 pairs of frontal bristles, rarely absent, the lowermost pair sometimes curving inward; scattered interfrontal setulae present; vibrissae present but weak. Wing unmarked; costa with a subcostal break, vein Sc incomplete or complete, parallel to R_1 up to the costa or apical part pallid; crossvein BM-Cu present, cell cup closed. Tibiae without dorsal preapical bristle.

Biology: The larvae are unknown but are believed to develop in a variety of organic detritus, such as nests and excrement of birds, mammal burrows, bat dung, rotting wood, below the bark of trees, etc. Adults are found on flowers, shrubs and grasses; in dry habitats, but also along river banks, in saltmarshes, in caves, and often indoors on windows. Species of *Aphaniosoma* and *Gymnochiromyia* preferentially occur in saltmarshes and semi-arid habitats and are frequent at flowering vegetation; *Chyromya* species seem to be associated with open deciduous woodland.

Identification: Andersson (1971b), Andersson (1976b), Collin (1933), Collin (1949), Czerny (1927), Ismay & Clemons (2001)

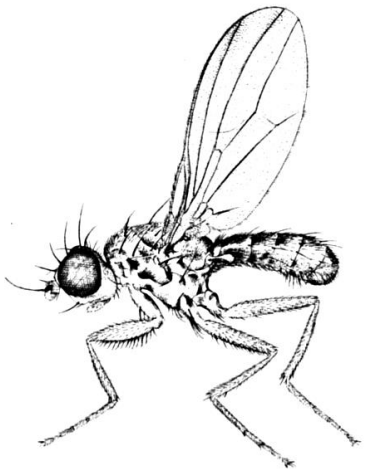


Gymnochiromyia sp.

Clusiidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Opomyzoidea
Number of British species: 10 **Size:** S **Difficulty:** 2

Characters: Minute to medium sized (1.5-8 mm), slender flies. Body dull to lustrous, yellow to dark brown or black, often with markings; near the eye often silvery white. Head small, arista pubescent or with longer rays; ocelli present; Ocellar bristles present to absent; Postvertical bristles diverging or absent; 2-5 pairs of frontal bristles curving backward, the lowermost pair in some cases curving inward; interfrontal bristles present to absent; vibrissae present. Wing clear to somewhat infuscated, often the apical portion darker or crossveins with dark bands; costa with a subcostal break, vein Sc complete; crossvein BM-Cu present, cell cup closed. Legs all yellow or partially darker; tibiae with or without dorsal preapical bristle.



Clusia flava male

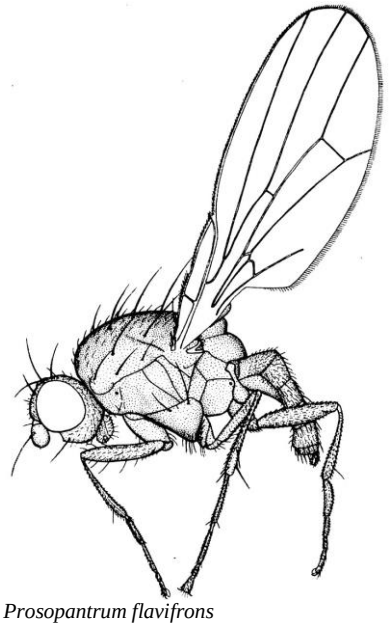
Biology: The larvae of the few species of which something is known live in rotting wood of deciduous trees, largely in mines of other insects. Adults are mainly found in damp deciduous forests near dead or dying trees, with males displaying courtship behaviour on trunks and stumps. Adults are not frequently netted but at proper locations they are frequently collected in Malaise traps.

Identification: Czerny (1928), Stubbs (1982), Withers (1985)

Cnemospathidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Sphaeroceroidea
Number of British species: 1 **Size:** S **Difficulty:** 3

Characters: Small flies. Postvertical bristles strong and crossed, gena broad. Two pairs of sternopleural bristles, mid tibia with extra apical and subapical bristles. Subcosta fused with R_1 before costa, costa without stronger bristles, anal vein not reaching margin of wing.



Prosopantrum flavifrons

Biology: Adults have been found on dung and carrion, but the early stages are unknown.

Identification: Ismay & Smith (1994)

Coelopidae

Kelpflies

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Sciomyzoidea
Number of British species: 2 **Size:** S–M **Difficulty:** 2

Characters: Small to medium sized (2.5-9 mm, usually 4-7 mm); robust, especially in *Coelopa* sometimes densely bristly or hairy, flattened and dark coloured. Eyes small, arista bare to pubescent; ocelli present; Ocellar bristles present; Postvertical bristles parallel or converging; 2 pairs of frontal bristles, curving outward; scattered interfrontal setulae present; vibrissae absent, but strong bristles present near the vibrissal angle; in some cases many long, hair-like bristles present. Wing unmarked; costa continuous, vein Sc complete; crossvein BM-Cu present; cell cup closed. Legs usually densely hairy; tibiae with dorsal preapical bristle.



Coelopa frigida

Biology: Coelopidae generally inhabit coastal habitats where the larvae largely develop in rotting seaweed washed up by the sea. Larvae and adults can be found throughout the year.

Identification: Burnet (1960), Egglishaw (1960)

Conopidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Conopoidea
Number of British species: 24 **Size:** S–L **Difficulty:** 1

Scheme

Characters: Small to large (3-20 mm, usually 5-15 mm), slender to stout flies, often lustrous with a black and yellow, wasp-like colour pattern or with reddish brown markings; mouthparts usually conspicuously long and geniculate. Arista bare; ocelli present or absent (Conopinae); Ocellar bristles small or absent; P-, F-, interfrontal bristles and vibrissae absent. Wing usually clear, in some cases with dark markings, e.g. along the costa; costa continuous; vein Sc complete; crossvein BM-Cu present, cell cup closed. Tibiae with (Myopinae) or without dorsal preapical bristle.



Conops



Physocephala nigra

Biology: Conopidae are parasitoids, in particular of bumblebees, bees and wasps in which the female deposits a single egg in the abdomen. This happens in flight while the conopid female holds the abdomen of her victim in a fixed position using special structures on her own abdomen. The larva develops inside, to the detriment of the host, pupating when the host dies. The adults feed on nectar and frequently visit flowers (for mating purposes as well). Species with very long mouthparts visit flowers with deep-lying nectar, such as Lamiaceae (Labiatae). The adults prefer warm and dry areas and can be found flying near vegetation rich in flowers, near blooming heather and on trees and shrubs in flower. The females often fly slowly through the vegetation searching for a suitable host. Many species show a striking resemblance to bees, wasps and their allies.

Identification: Collin (1960a), Smith (1969b)

Culicidae

Mosquitoes, Gnats

NEMATOCERA, Culicomorpha, Culicoidea

Number of British species: 32 **Size:** S–M **Difficulty:** 2–3 Scheme

Characters: Small to medium sized (3-9 mm, rarely up to 15 mm), pale to dark coloured Nematocera with slender wings, delicate legs and abdomen; with long mouthparts, in the female piercing; wings, legs and often abdomen (partially) covered by scales. Head with elongate mouthparts that are much longer than the head; eyes reniform, dichoptic; ocelli absent; antenna with 15 segments, with long verticils in the male, verticils shorter in the female.



Culex pipiens female, male and larva (below)



Biology: The larvae largely develop in shallow stagnant waters, predominantly in small or temporary bodies of water. They feed on particles of detritus, bacteria, algae, etc.; a few species are predatory, mainly on other culicid larvae. The females feed on the blood in order to obtain protein for the development of their eggs. Feeding preferences vary from one species to another and hosts include cold-blooded vertebrates but especially birds and mammals, including humans. The Culicidae occupy virtually all habitats and can occur locally, or temporarily, in vast numbers. Due to their blood feeding habits they can be such a nuisance that they interfere with human activities and have a negative impact on the yield of cattle breeding. Apart from this, they are vectors of several serious diseases of which malaria is the best known and claims the greatest number of casualties.

Identification: Coe *et al.* (1950), Cranston *et al.* (1987), Edwards *et al.* (1939), Marshall (1938), Snow *et al.* (1998)

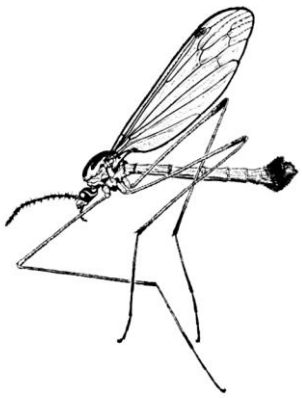
Cylindrotomidae

Long-bodied Craneflies

NEMATOCERA, Tipulomorpha, Tipuloidea

Number of British species: 4 **Size:** M **Difficulty:** 1 Scheme

Characters: Large (11-16 mm), yellowish to pale brownish Nematocera with long, slender antennae, wings, legs and abdomen. Head with a short rostrum; nasus absent; antenna with 16 segments; ocelli absent. Upper side of the thorax with 3 wide dark stripes, or thorax mainly grey *(Triogma);* transverse suture distinct in median third of thorax, fading out laterally. Wing with 2 anal veins. Abdomen in male with bipartite *(Diogma)* or tripartite distiphallus, in female with broad and short cercus.



Cylindrotoma distinctissima male

Biology: Larvae phytophagous and, *Cylindrotoma* excepted, living on terrestrial, semi-aquatic and aquatic mosses. The larvae of *Cylindrotoma* living on various herbs *(Caltha, Viola, Stellaria, Anemone,* etc.) in moist woodland habitats with a life mode similar to that of caterpillars. The adults predominantly in marshy areas and moist woodland, resting on the vegetation or slowly flying about near the sites where the larvae are found.

Identification: Coe *et al.* (1950), Edwards (1938a), Stubbs (Unpublished)

Diadocidiidae

NEMATOCERA, Bibionomorpha, Sciaroidea
Number of British species: 3 **Size:** S **Difficulty:** 3 Scheme

Characters: Small (3-4.5 mm), yellowish brown, delicate Nematocera with pale brown to grey wings with a characteristic venation. Head and eyes small; eyes dichoptic; ocelli present; antenna with 17 segments. Thorax vaulted. Legs slender, coxae elongate; tibiae with apical bristles or spurs.

Biology: The larvae feed on mycelium, encapsulated in mucous tubes in and underneath rotting wood and in mushrooms and bracket fungi. In some cases the adults are found in and around hollow tree stumps in great numbers.

Identification: Chandler (1978b), Chandler (1987b), Edwards (1913), Edwards (1925), Hutson *et al.* (1980)



Diadocidia spinosula

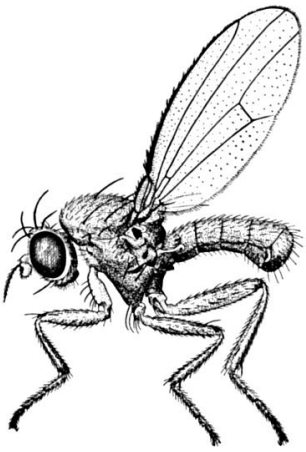
Diastatidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Ephydroidea
Number of British species: 6 **Size:** S **Difficulty:** 2 Panel

Characters: Small (2.5-4 mm), stout, dark flies with grey pruinosity, head partially dull yellow and lustrous silvery grey; antennae and legs largely yellow. Arista short to medium plumose; ocelli present; Ocellar bristles present, Postvertical bristles converging; 2 pairs of frontal bristles, the outer pair curving forward, the inner pair backward; interfrontal bristles absent; vibrissae present. Wing with various patterns of dark markings, in some cases clear, but cell c always darkened; costa with both humeral and subcostal breaks and with several small spines among the customary setulae; vein Sc incomplete; crossvein BM-Cu present; cell cup closed. Tibiae with dorsal preapical bristle.

Biology: The larvae of this small family are unknown; they are thought to be saprophagous because the adults are frequently encountered near litter and soil, in all types of woodland marshes, bog areas and alongside stagnant waters sometimes in great numbers.

Identification: Chandler (1986), Chandler (1987a)



Diastata fuscula male

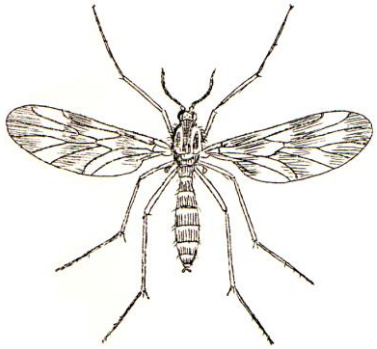
Ditomyiidae

NEMATOCERA, Bibionomorpha, Sciaroidea
Number of British species: 3 **Size:** S **Difficulty:** 3 Scheme

Characters: Medium sized (6-8 mm), yellowish brown Nematocera with long and slender legs and abdomen, and a characteristic venation (including a long vein R_{2+3}). Head and eyes small; eyes almost touching each other or distinctly dichoptic; ocelli present; antenna with 15 segments, in some cases laterally compressed and/or long pubescent. Thorax vaulted. Wing clear or slightly tinged *(Symmerus)* or with transverse bands *(Ditomyia);* anal lobe weak or absent. Coxae elongate; tibiae with long apical bristles or spurs.

Biology: The larvae live in bracket fungi and in dead parts of deciduous trees. The adults are found in woodland areas where most of their activity probably takes place at dusk and in the evening.

Identification: Chandler (1978b), Edwards (1913), Edwards (1925), Hutson *et al.* (1980)



Ditomyia fasciata

Dixidae

Meniscus-midges

NEMATOCERA, Culicomorpha, Culicoidea
Number of British species: 15 **Size:** S **Difficulty:** 1–3 Scheme

Characters: Small to medium sized (3-5.5 mm), yellowish to brownish grey Nematocera. Antennae, wings, legs and abdomen long and slender. Ocelli absent; antenna with 16 segments. Wing usually clear, with an anal lobe and in some cases characteristic pigment spots; vein R_{2+3} strongly curving. Tibiae of fore and mid leg with short spurs.

Biology: The larvae are found at or near the water surface where they take on a characteristic body posture, a reversed U shape, near the edge of the water or just above it, holding themselves up by objects projecting from the water surface. Pupation also takes place there. They are filter feeders, living on microorganisms and tiny particles of organic matter. *Dixa* larvae prefer running water, those of *Dixella* are usually found in stagnant water, while both genera occur in slow-moving water. The adults mainly occur near the larval habitats where the males may fly in swarms.

Identification: Disney (1999a), Goldie-Smith (1989)

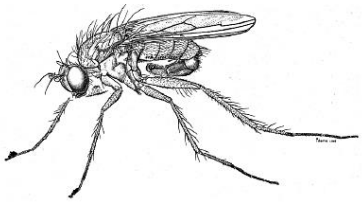


Dixa female

Dolichopodidae

BRACHYCERA, Asilomorpha, Empidoidea
Number of British species: 287 **Size:** T–M **Difficulty:** 1–3 Scheme

Characters: Minute to medium sized (1-9 mm) flies with long and slender legs. Body slender, the smaller species stouter. Body colour usually greenish metallic lustrous, in some cases dull yellow, brown or black. Eyes virtually always dichoptic; third antennal segment largest and with a usually long, apical or dorsal arista; mouthparts usually short and with a wide aperture adapted for sucking small prey. Wing clear or tinged, in some cases partially strongly coloured, marked or with distinct spots; cells br, bm and cup small, cell cup and/or the anal vein may be absent; crossvein BM-Cu absent; 2 veins branching from crossvein DM-Cu go in the direction of the wing margin; the upper one in some cases strongly curving or forked into M_1 and M_2. Legs, the tibiae in particular, usually with long bristles; in some genera legs raptorial.



Dolichopus

Biology: The larvae prey on small invertebrates and are found in particular in moist soil, in rotting organic matter, below tree bark, etc.; larvae of *Thrypticus* mine the stalks of Monocotyledons. Truly aquatic species are lacking but many are semi-aquatic (living in the water margin zone); a restricted number of species develop at the shores of saline inland bodies of water or the intertidal zone along seashores. The adults occur in a wide range of habitats, for example near water or more in the open, e.g. in meadows and gardens. They are often sitting high on their legs on the ground or on vegetation, on tree trunks, rocks, walls etc.; some species walk about on the water surface. The adults, like the larvae, are predators, largely feeding on small invertebrates. The species of *Dolichopus*, for example, prefer to prey on the larvae of Culicidae.



Liancalus virens

Identification: Chandler (1989), Chandler (1999g), Cole (1989), Cole (1991), Dyte (1993), Dyte (1996), Fonseca (1978), Laurence (1995), MacGowan (1997), MacGowan (2001a), Meuffels & Grootaert (1990), Perry (1999), Pollet (1990), Pollet (1993), Pollet (1997)

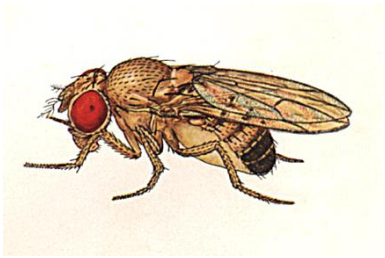
Drosophilidae

Fruitflies

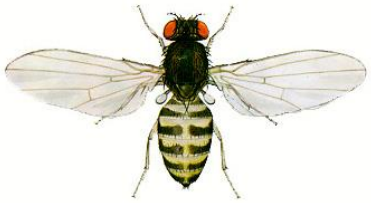
BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Ephydroidea

Number of British species: 59 **Size:** S **Difficulty:** 2–3 Scheme

Characters: Minute to medium sized (1.5-7 mm) flies, dull or lustrous with body colour varying from yellow to brownish black, often with some whitish markings on head and thorax and/or a pattern of stripes on thorax and abdomen; when alive eyes often clear red. Arista usually with long rays, in some cases pubescent; ocelli present, Ocellar bristles present, except in *Acletoxenus;* Postvertical bristles usually present, converging; 3 pairs of frontal bristles, 1 pair curving forward or obliquely inward, 2 pairs backward; scattered interfrontal bristles present; vibrissae present. Wing usually unmarked, in some cases with dark markings or extensively infuscated; costa with both humeral and subcostal breaks; vein Sc incomplete; crossvein BM-Cu usually absent, in some cases present; cell cup open or closed. Tibiae virtually always with dorsal preapical bristle, sometimes small or absent (e.g. *Cacoxenus).*



Drosophila melanogaster



Vinegar fly *Drosophila hydei*

Biology: The larvae of most species feed on micro-organisms in rotting organic matter such as fruits, mushrooms, bracket fungi, cacti, etc. Other larvae live in slime fluxes or exuding tree sap, are miners, or prey on other insects (e.g. larvae of *Cacoxenus* living as parasitoids in nests of solitary bees *Acletoxenus* larvae are predators of larvae of Aleurodidae). The adults are usually attracted by the scent of mushrooms, bracket fungi, ripening or rotting organic matter, and are very frequently found indoors. Some species are easy to rear in large numbers, using artificial substrates. Hence Drosophilidae are much used in scientific research in a large variety of fields.

Identification: Bächli & Burla (1985), Basden (1954), Beuk & Máca (1995), Chandler (1987c), Fonseca (1965), Gibbs (1994), Máca (1980), Shorrocks (1972)

Dryomyzidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Sciomyzoidea
Number of British species: 6 **Size:** M **Difficulty:** 1

Characters: Medium sized to large (5-18 mm), yellow, orange, or brown coloured, bristled or quite 'hairy' flies. Arista bare to pubescent; ocelli present; Ocellar bristles present, Postvertical bristles parallel to diverging; r-z pairs of Fbristles, curving obliquely out-backward; scattered interfrontal setulae present; vibrissae absent. Wing clear or tinged and often with dark bands along the crossveins; Costa continuous; vein Sc complete; crossvein BM-Cu present; cell cup closed. Tibiae with dorsal preapical bristle.


Dryomyza flaveola

Biology: The larvae develop in rotting organic matter such as mushrooms and bracket fungi, droppings, carrion, etc. The adults are mainly found in moist, shaded places in woodland areas, usually on putrefying matter, including carrion, decaying mushrooms, excrement and tree sap.

Identification: Czerny (1930), Egglishaw (1960), Steyskal (1957)

Empididae

Dance-flies

BRACHYCERA, Asilomorpha, Empidoidea
Number of British species: 208 **Size:** T–L **Difficulty:** 1–3 Scheme

Characters: Minute to large (1-12 mm, sometimes larger), slender to robust, pallid to dark flies, in several genera with powerful, piercing mouthparts. Head small with relatively large eyes, in some cases holoptic, often with an incision at level of antennae; antenna usually with 3 segments of which the third is the largest and bears a short or long, usually apical arista or style; mouthparts short to strongly elongate, in the latter case projecting forward or downward toward the fore legs. Wing clear or (partially) tinged, in some cases with a stigma spot, or with a distinct wing pattern; vein R_{4+5} often forked; cell dm almost always present. Legs powerful, usually long and slender; in some cases fore legs raptorial, adapted to catching and holding on to prey.


Copulating pair of *Rhamphomyia sulcata*. The male (top – hanging from a grass blade by his middle leg) has presented the female (middle) with prey – a hoverfly (bottom) - and mates with her whilst she is busy feeding on it.

Biology: The larvae prey on other insects, mainly larvae of Diptera living in the ground, on organic matter, or in decaying wood; some are aquatic. The adults are originally predators as well, mainly on flying Diptera, but some species forage by walking about on tree trunks or prey on aquatic insects, including those that have just pupated near the shoreline. Some adults visit flowers and partially or entirely feed on pollen and nectar. Many species form swarms, the males offering a prey or a silken balloon, which may or may not contain a prey, to the female as part of the mating ritual. In *Hormopeza* large swarms of both sexes have been observed in smoke of wood fires.

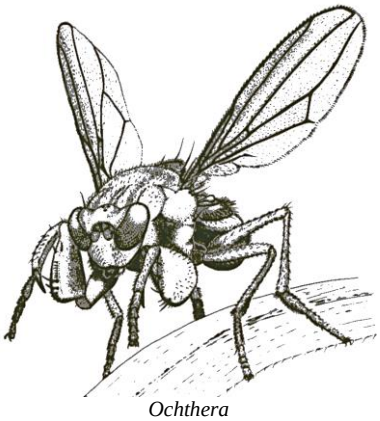
Identification: Chandler (1992c), Chvála (1992), Chvála (1994), Collin (1961), Drake & Chandler (1997)

Ephydridae

Shoreflies

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Ephydroidea
Number of British species: 148 **Size:** S **Difficulty:** 3–4

Characters: Minute to medium sized (1-11 mm), usually dull, dark coloured flies. Face often swollen and convex; arista sometimes bare to pubescent but usually with long rays dorsally only; ocelli present; Ocellar bristles present, Postvertical bristles absent, pseudopostocellar-bristles, if present, parallel to diverging; frontal bristles pairs variable, curving forward, outward, or backward, in some cases absent; scattered interfrontal setulae present or absent; vibrissae present. Wing usually unmarked, in some cases darkened, marked or spotted; costa with humeral and subcostal breaks; vein Sc incomplete; crossvein BM-Cu absent; cell cup open or absent. Only tibia of mid leg in some cases with dorsal preapical bristle; in some cases fore legs raptorial.



Ochthera

Biology: The Ephydridae usually inhabit aquatic, semi-aquatic and coastal or non-coastal saline habitats where they may be found in large numbers. The larvae feed on microorganisms such as bacteria algae and yeasts; some species prey on insects and other small aquatic life forms while others prefer rotting animal tissue, excrement, eggs of spiders or frogs; species feeding on plant juices or mining in plants are known as well. Adults are usually found, sometimes in very large numbers, on or near the soil in humid or wet habitats where they mate, oviposit, or feed on a wide variety of organic matter like algae, honeydew, carrion, etc.; otherwise, adults may be found at some distance from humidity, e.g. on tree trunks and in vegetation. Some species have been recorded as pests in crops and greenhouses.



Ditrichophora

Identification: Andersson (1971a), Becker (1926), Canzoneri & Meneghini (1983), Cogan & Dear (1975), Collin (1943a), Collin (1964), Collin (1966a), Dahl (1959), Drake (2000), Drake (2001), Irwin (1985a), Mathis & Zatwarnicki (1990), Olafsson (1991), Perry & Drake (2001), Skidmore (1996), Wirth (1975), Zatwarnicki (1997)

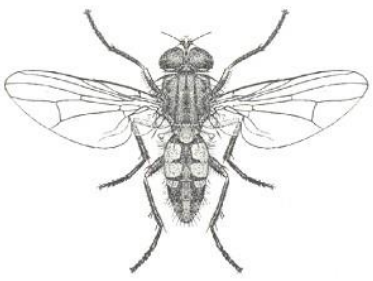
Fanniidae

Lesser-houseflies

BRACHYCERA, Muscomorpha Schizophora Calyptratae, Muscoidea
Number of British species: 60 **Size:** S–M **Difficulty:** 2–3

Panel

Characters: Small to medium sized (2-5 mm, some up to 9 mm) flies, usually with grey to black body colour. Occiput without white or pallid, thin hair-like bristles; arista bare to pubescent; interfrontal bristles absent. Meral bristles absent; lower side of scutellum bare in its middle region; subscutellum absent. Lower calypter small. Apical half of vein Sc straight; vein M_1 not strongly curving; anal vein not reaching the wing margin; vein A2 and the anal vein would intersect if A2 would continue further. Tibia of hind leg with a submedian dorsal bristle.



Fannia canicularis

Biology: The larvae are saprophagous and feed mostly among decaying organic materials. Many are surface scrapers, feeding on micro-organisms on the surface of the substrate, which include a wide range of vegetable and animal detritus, mushrooms, nests or burrows of birds, mammals and insects dead insects, molluscs and vertebrates, animal droppings and dung, human faeces etc. The adults occur mainly in or near woodland areas and less in more open habitats. The males of several species fly in swarms. Some species have successfully adapted to the human environment and are frequently met with indoors. Good examples are

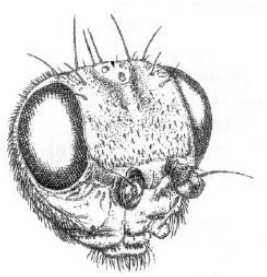
Fannia canicularis (Linnaeus) (the lesser housefly) and *F. scalaris* (Fabricius) (the latrine fly).

Identification: Fonseca (1968), Pont (1983), Rozkošný *et al.* (1997)

Helcomyzidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Sciomyzoidea
Number of British species: 1 **Size:** M **Difficulty:** 1

Characters: Medium sized to large (6-11mm) stout, predominantly grey dusted flies, densely covered with fine hairs. Head large with relatively small eyes, arista bare to pubescent, ocelli present, ocellar bristles reduced or absent, postvertical bristles parallel to somewhat divergent, one to two pairs of frontal bristles curving outwards, scattered interfrontal hairs present, vibrissae absent. Precoxal bridge present. Wing with costal bristles present, unmarked, crossvein often darkened, costa without costal breaks, vein Sc complete, crossvein BM-Cu present, cell cup closed. Tibia with dorsal preapical bristle.



Helcomyza head – modified after Oosterbroek 2006

Biology: The species of this small family occur along the coast, where the adults are often found on the beach, making a short flight when disturbed. The larvae live in seaweed washed up on the beach, which has dried to a greater extent than the seaweed in which Coelopidae, Heterocheilidae or *Orygma* (Sepsidae) species are living. Only one species, *Helcomyza ustulata*, occurs in Britain.

Identification: Stackelberg (1989)

Heleomyzidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Sphaeroceroidea
Number of British species: 59 **Size:** S–M **Difficulty:** 2

Characters: Robust, minute to large (1.2-12 mm), pallid yellow to dark grey or brown, in some cases reddish flies. Arista bare or plumose; ocelli present Ocellar bristles present; Postvertical bristles converging; 1 or 2 pairs) of frontal bristles, curving outward or backward; interfrontal bristles absent, interfrontal setulae present or absent; vibrissae present. Wing clear, tinged or with a pattern, especially along the crossveins; Costa with a subcostal break vein Sc complete; crossvein BM-Cu present cell cup closed. Tibiae usually with dorsal preapical bristle which may be lacking in *Oldenbergiella.*



Suillia similis



Tephrochlamys rufiventris

Biology: The larval habitats of the various subfamilies can be summarised as follows: In the Heleomyzinae and Heteromyzinae the larvae mainly feed on rotting organic matter and can be found in carrion, excrement, mushrooms, bracket fungi, animal burrows, nests of birds, etc. The larvae of the Suilliinae have chiefly been found in mushrooms and bracket fungi. The adults are often found near the larval habitats, e.g. in woodland areas, but also in caves and in or near nests of birds and mammal burrows.

Identification: Collin (1943b), Collin (1951), Papp (1978b), Withers (1987)

Heterocheilidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Sciomyzoidea
Number of British species: 1 **Size:** M **Difficulty:** 1

Characters: Medium sized (6-9mm), stout, largely greyish brown species, densely covered with fine hairs. Head large with small eyes, arista bare to pubescent, ocelli present, ocellar bristles present, postvertical bristles more or less parallel, three pairs of frontal bristles curving outwards, scattered interfrontal hairs present, vibrissae absent. Wing unmarked, costa unbroken, vein Sc complete, crossvein BM-Cu present, cell cup closed. Tibiae with dorsal preapical bristle present.



Heterocheila buccata

Biology: The sole representative of this family in Europe, *Heterocheila buccata*, is a species of coastal habitats. The larvae develop in seaweed washed up on the shore. The adults are usually found near the larval breeding sites.

Identification: Stackelberg (1989)

Hippoboscidae

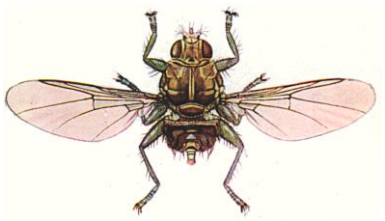
Birdlice-flies

BRACHYCERA, Muscomorpha Schizophora Calyptratae, Hippoboscoidea
Number of British species: 14 **Size:** M **Difficulty:** 2

Characters: Small to medium sized (2.5-10 mm) flies. Most species are dorsoventrally flattened as an adaptation to their ectoparasitic mode of life. Head closely adpressed to thorax and eyes well-developed. Most species possess well-developed wings and are able fliers; some have reduced wings or shed their wings after finding a suitable host. Wing venation reduced and concentrated at the wing base and anterior region. Legs short and powerful; coxae of mid legs and usually also hind legs far apart; tarsi with hook-like claws, enabling these insects to cling to the hairs or feathers of their hosts.



Liptoterna cervi



Ornithomya avicularia

Biology: All species are ectoparasites of birds or mammals and feed on blood. The larvae develop inside the abdomen of the female fly and are deposited one by one, immediately followed by pupation, generally on the ground or in the soil. Most species visit a limited number of host species but some species are found on species of birds sharing the same habitat. Flightless species can find new hosts by contact between hosts or through infection at nest sites.

Identification: Hutson (1984)

Hybotidae

BRACHYCERA, Asilomorpha, Empidoidea
Number of British species: 176 **Size:** T–S **Difficulty:** 1–3 Scheme


Hybos

Characters: Minute to medium sized (1-6 mm, rarely larger) flies, usually dark but colour variable, yellow to black. Eyes relatively large, dichoptic or holoptic, with an incision near the antennae; antenna short or with a large third segment and long arista; mouthparts varying between short (Ocydromiinae) to long and directed straight or obliquely downward (Hybotinae) or directed downward (Tachydromiinae). Wing clear or tinged in some cases with markings, along the costa and around or in between veins R_1 and R_{2+3} in particular; cell dm absent (Tachydromiinae) or present. Legs long, slender and often partially adapted to catching and holding prey; femora of fore legs and/or mid legs swollen in the Tachydromiinae while in the other subfamilies those of the hind legs are swollen.

Biology: The larvae of only a few species are known. They live in soil, rotting wood, organic matter, dung, etc., and prey on small invertebrates. The adults prey on small insects and other arthropods, catching their prey in flight (Hybotinae, Ocydromiinae, some Tachydromiinae) or while walking or running about on the ground, on tree trunks, leaves, etc. (most Tachydromiinae). Only a few species visit flowers to feed on nectar and pollen. Swarming has been observed in the Ocydromiinae.

Identification: Chvála (1975), Chvála (1983), Chvála (1989), Collin (1961), Grootaert (1992), Hewitt & Chvála (2002)

Keroplatidae

NEMATOCERA, Bibionomorpha, Sciaroidea
Number of British species: 52 **Size:** S–M **Difficulty:** 3 Scheme


Macrocera

Characters: Medium to large (4-15 mm), slender and delicate to stout, in some cases conspicuously coloured Nematocera with characteristic venation (e.g. crossvein R-M absent). Head small; mouthparts sometimes elongated; ocelli present; eyes dichoptic; antenna with 16-17 segments; antenna ranging from relatively short, consisting of laterally compressed segments to very slender and longer than the body. Thorax vaulted. Wing relatively wide, clear or with markings or crossbands, in *Macrocera* with a striking anal angle. Coxae elongate; tibiae with apical bristles or spurs.

Biology: The larvae are usually found in moist and dark spots in woodland. Keroplatinae larvae often occur underneath bracket fungi where they construct a web to collect spores (mycophagous species) or catch small invertebrates (predatory species). The latter group includes species provisioning the strands of their web with acid fluids in order to kill their prey. *Macrocera* larvae are found in rotting wood, underneath tree bark and below tree trunks. They are covered in a thin layer of mucus and feed on animal detritus or prey upon small invertebrates. The adults are found near the larval habitats; some species visit flowers where they feed on nectar; species of *Macrocera* are often found on the upper side of leaves, standing high on their legs and holding their wings slightly spread out.

Identification: Chandler (1978b), Chandler (1987b), Chandler (1990), Chandler (1992a), Chandler (1992b), Edwards (1913), Edwards (1925), Edwards (1941), Hutson *et al.* (1980)

Lauxaniidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Lauxanioidea
Number of British species: 54 **Size:** S **Difficulty:** 2 Panel


Lyciella


Minettia

Characters: Small to medium sized (2-7 mm), often rather plump, dull or partially lustrous flies; body colour varying from yellow to brown or black, or with a combination of colours. Arista bare, pubescent, or with long rays; ocelli present; Ocellar bristles present; Postvertical bristles converging, in rare cases parallel (e.g. among a few specimens of *Cnemacantha muscaria* (Fallen)); 1-2 pairs of frontal bristles, curving backward, the lower pair in some cases curving inward; interfrontal bristles absent; vibrissae absent but some genera, e.g. *Trigonometopus*, with strong bristles near the vibrissal angle. Wing usually unmarked, in a number of species with spots along the veins, in some cases entirely marked; Costa continuous; vein Sc complete; crossvein BM-Cu present; cell cup closed. Usually all tibiae with dorsal preapical bristle but in a few cases tibia of hind legs without such bristle.

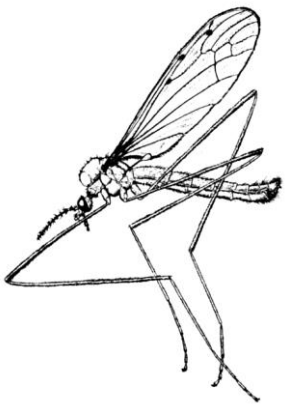
Biology: As far as known the larvae live on micro-organisms in bracket fungi and mushrooms, in rotting vegetable matter, in some cases as miners or in nests of birds. The majority of species are found in shaded spots in moist woodlands, marshes, banks, etc. Some species of *Homoneura*, *Minettia* and *Calliopum* are adapted to drier, more open habitats like dunes and grasslands.

Identification: Allen (1989), Collin (1933), Collin (1948), Collin (1966d), Falk (1994), Godfrey (1994a), Godfrey (1994b), Papp (1978a), Papp (1984), Shatalkin (2000)

Limoniidae

Short-palped Craneflies

NEMATOCERA, Tipulomorpha, Tipuloidea
Number of British species: 212 **Size:** S–M **Difficulty:** 1–2 Scheme


Limonia phragmitidis

Characters: Pale yellow to black, small to very large (2-11 mm, a single species up to 30 mm) Nematocera with slender antennae, legs and abdomen. Rostrum usually short and without nasus; ocelli absent antenna usually with 14-16 segments, in some cases *(Hexatoma)* less or *(Ludicia)* more. Thorax with a V-shaped transverse suture. Wing with 2 anal veins; in some cases wing with characteristic markings or wing reduced in females.

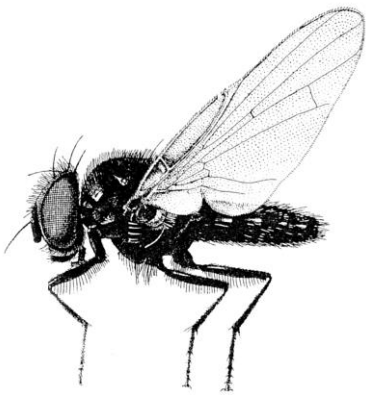
Biology: The larvae are generally found in various aquatic and semi-aquatic habitats. Some species are terrestrial, living in mosses, mushrooms, bracket fungi, or in dying or decaying wood. A few species are found in brackish or saline habitats. Most larvae feed on rotting vegetable matter, algae mosses, mushrooms, etc. The subfamily Limnophilinae has many species of which the larvae prey on insect larvae, on worms and other small invertebrates. In the subfamily Limoniinae most larvae live in a tube made of strands they have spun and in which they also pupate. Adults are found in several, usually moist habitats, often near those inhabited by their larvae. Males often fly in swarms.

Identification: Coe *et al*. (1950), Edwards (1938a), Geiger (1986), Stubbs (Unpublished)

Lonchaeidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Tephritoidea
Number of British species: 44 **Size:** S **Difficulty:** 3–4

Characters: Usually stout, metallic green or bluish black, small to medium sized (3-6 mm) flies. Head large, hemispherical, showing considerable sexual dimorphism with frons narrower in the male; lunula large; arista bare or with shorter to longer pubescence; ocelli present; Ocellar bristles present; Postvertical bristles weak, diverging; 1 pair of frontal bristles, situated at the level of the ocellar triangle and curving backward; scattered interfrontal setulae present; vibrissae absent but in some genera with a series of vibrissa-like bristles near the vibrissal angle. Wing unmarked cell c wide vein Sc complete; costa with a subcostal break; crossvein BM-Cu present; cell cup closed. Haltere dark brown to black. Tibiae without dorsal preapical bristle or present only on tibia of mid legs. Abdomen short, wide, dorsoventrally flattened; the female with a lanceolate, incompletely retractable ovipositor.



Lonchaea male

Biology: The larvae of most species are found in mouldering wood and underneath the bark of dying or dead trees, with several species associated with certain tree species. In other species the larval development takes place in rotting vegetable matter such as onions, conifer seeds, fruits, vegetables, galls on grasses or other substances. The larvae of most species feed on vegetable matter, although some are carrion eaters or prey on the larvae of other insects, e.g. those of beetles. Males congregate in swarms in openings in forests. Lonchaeidae are usually less frequently encountered and in many cases have been obtained by rearing; however, they are by no means rare as is clear from the larger series obtained by beer/wine traps and Malaise traps.

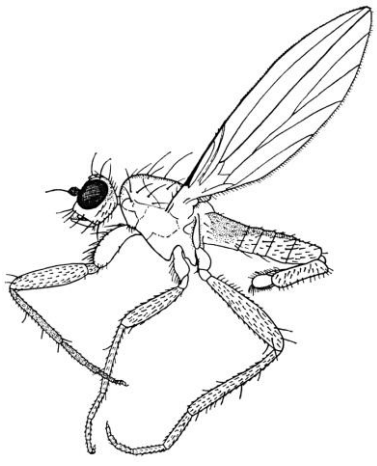
Identification: Allen (2003), Chandler (1998b), Collin (1953), Hackman (1956), MacGowan (2001b), MacGowan (2001c), MacGowan & Rotheray (1999), MacGowan & Rotheray (2000)

Lonchopteridae

Pointed-wing Flies

BRACHYCERA, Muscomocpha Aschiza, Lonchopteroidea
Number of British species: 7 **Size:** S **Difficulty:** 2 Scheme

Characters: Small (2-5 mm), yellow to brownish black flies with strong bristles and long, subacute wings. Eyes broadly dichoptic; third antennal segment rounded, with a long arista; 1 pair of strong, diverging bristles just above the antennae. Wing clear to tinged, rarely with markings; venation characteristic and sexual dimorphic: in male anal vein reaching the hind margin, in the female ending in vein CuA_1.



Lonchoptera lutea male

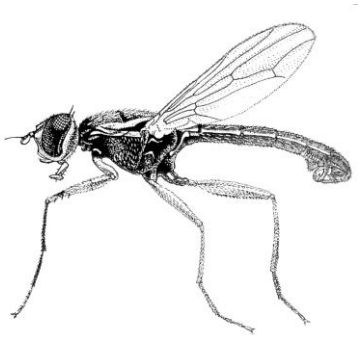
Biology: The larvae feed on rotting vegetable matter, perhaps including mushrooms and bracket fungi. They can be found among dead leaves, in plant debris and other decaying material in various habitats ranging from gardens to woodland and meadows. The adults feed on nectar and are in some cases found in large numbers, often in moist places alongside running or stagnant waters, in woodlands, marshes, some species in the tidal zone; other species prefer drier habitats, some are ubiquitous and occur in a variety of habitats from lowlands to high mountain areas. Most species are bisexual, but at least *L. bifurcata* (Fallen) is parthenogenetic in most areas of its nearly cosmopolitan range.

Identification: Smith (1969a)

Megamerinidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Diopsoidea
Number of British species: 1 **Size:** M **Difficulty:** 1 Study group

Characters: The only European species, *Megamerina dolium*, *is* medium sized (6-9 mm), elongate, black lustrous with pale to reddish femora. Head small and spherical; arista pubescent; ocelli present; Oc-, P-, F-, interfrontal bristles and vibrissae absent. Wing pale brown, unmarked; Costa continuous; vein Sc complete; crossvein BM-Cu present; cell cup closed. Femora of hind legs swollen, with 2 rows of spines on the lower side; tibiae without dorsal preapical bristle.



Megamerina dolium

Biology: The larvae live under the bark of dying or dead deciduous trees and are predatory or necrophagous on the larvae of other insects. The adults are largely found near the larval habitats, chiefly on tree trunks and leaves.

Identification: Chandler (1975)

Micropezidae Stiltflies

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Nerioidea
Number of British species: 9 **Size:** S–L **Difficulty:** 2 Study group

Characters: Strikingly slender flies of small to large size (3-16 mm) with narrow wings and long legs. Head small, rounded to elongate; antenna small with arista bare or pubescent; ocelli present Ocellar bristles absent; Postvertical bristles diverging or absent; 0-3 pairs of frontal bristles, if present, curving forward or backward; interfrontal bristles absent; vibrissae absent. Wing clear to fumosely patterned; Costa continuous; vein Sc complete, its ending in the costa may be close to that of vein R_1; crossvein BM-Cu present or absent (in the Micropezinae); cell cup closed. Tibiae without dorsal preapical bristle.



Calobata

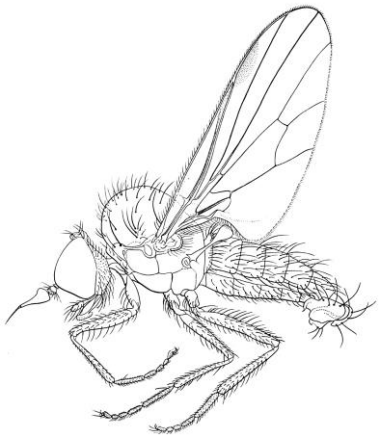
Biology: With respect to their biology, the European Micropezidae can be divided in three groups. Species of *Micropeza* have phytophagous larvae feeding in the root nodules of leguminous plants and are associated with open habitats; species of *Rainieria* develop in the rotting wood of deciduous trees and are restricted to old forests; the majority of the other species have saprophagous larvae living in decayed vegetation, old manure or fungi and their adults usually prefer humid forests along river and creeks. Adult Micropezidae prey on small insects and other invertebrates and can be found on flowers, leaves, rotting fruit, excrement, etc.

Identification: Andersson (1989), Chandler (1975), Collin (1945), Roháček & Barták (1990)

Microphoridae – now in Dolichopodidae

BRACHYCERA, Asilomorpha, Empidoidea
Number of British species: 3 **Size:** S **Difficulty:** 2 Scheme

Characters: Minute to small (1.5-3 mm), greyish to black flies. Head and eyes relatively large; male holoptic; third antennal segment elongate with terminal arista; mouthparts somewhat elongate, directed straight forward or obliquely downward. Wing clear or tinged, in some cases with a stigma spot; costa surrounding the wing entirely; cell cup small; anal vein short or absent; cell dm present with 3 veins from cell dm to the wing margin. Legs short, hind leg in some cases compressed and with conspicuous widened tibia and first tarsal segment.



Microphor holosericeus male

Biology: The larvae of this small family are little known; they are assumed to prey on organisms living in rotting organic material in sandy soil in particular. The adults are predators but can also frequently be found on flowers where they feed on pollen and nectar. The females of the genus *Microphor* are known to feed on insects caught in webs of spiders. Both males and females fly in swarms.

Identification: Chvála (1983), Collin (1961)

Milichiidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Carnoidea
Number of British species: 18 **Size:** T–S **Difficulty:** 3 Panel

Characters: Minute to medium sized (1-6 mm), usually dark coloured, sometimes lustrous black flies and/or with extensive silvery dusting. Mouthparts sometimes elongate; arista bare to pubescent; ocelli present; Ocellar bristles present; Postvertical bristles parallel or converging; 2-7 pairs of frontal bristles, nearly always the lower 2 pairs curving inward, the upper pairs curving forward, outward, or backward; interfrontal bristles present, in some cases in distinct rows in other cases more scattered; vibrissae or vibrissa-like bristles present sometimes very thin. Wing unmarked; costa with humeral and subcostal breaks; vein Sc incomplete; crossvein BM-Cu usually present, in some cases vague or absent; cell cup closed. Tibiae without dorsal preapical bristle.



Madiza glabra male

Biology: The species in this family show diverse modes of life; most species feed on organic matter or animal waste, several species feed on dung, sap exuding from tree wounds, seeds, in nests of birds, in nests of ants and other social insects, etc. Adults can be expected in all sorts of habitats, including indoors; they also regularly visit flowers, carrion and dung. Adults of some species are known to attach themselves to spiders and predatory insects (e.g. Asilidae) in order to suck juices from the prey caught by these animals.

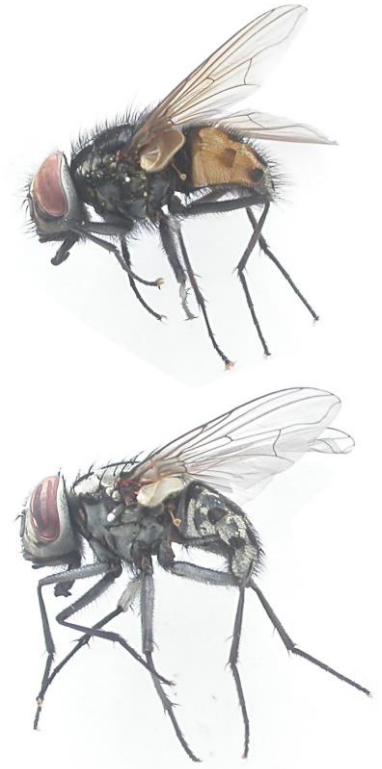
Identification: Hennig (1937), Sabrosky (1983), Séguy (1934)

Muscidae

Houseflies

BRACHYCERA, Muscomorpha Schizophora Calyptratae, Muscoidea
Number of British species: 281 **Size:** S–M **Difficulty:** 2–3 Panel

Characters: Small to large (2-18 mm) flies, usually coloured grey to black, in some cases yellowish brown or with an extensive green to blue metallic lustre. Mouthparts well developed; occiput lacking white or pallid hairs; arista bare to long plumose; interfrontal bristles usually absent, in some cases present in female (e.g. in *Azelia).* Scutellum bare underneath; subscutellum absent; meral bristles virtually always absent although *Eginia* has a patch of rather strong bristles and *Graphomya* has a row of rather weak bristles. Wing with apical half of vein Sc distinctly curving; vein M_1 straight or with a faint to distinct forward curve; cell r_{4+5} open; anal vein usually well developed, but not continuing to wing margin; vein A2 and the anal vein would not intersect if virtually continued further (with the exception of some species of *Azelia).* Tibia of hind leg lacking a submedian dorsal bristle.



Graphomyia maculata male (above) female (below)

Biology: The following life modes of the larvae are known: carnivorous (Phaoniinae, Mydaeinae, *Coenosia, Limnophora, Lispe, Graphomya),* saprophagous in decaying organic matter (vegetable, animal, or excrement) where the third instar may or may not be carnivorous (Muscini, Stomoxyni, *Hydrotaea)* or, rarely, phytophagous *(Atherigona).* The larvae of *Phaonia exoleta* (Meigen) are known to live in rot holes in trees where they feed on the larvae of Culicidae; those of *Limnophora riparia* (Fallen) live in running water and the splash zones along canals, larvae of other genera are semi-aquatic (e.g. *Limnophora*, *Lispe*, *Graphomya).* Many species have adapted to human environments. The adults of most species feed on nectar but some species are predators (Coenosiinae), feed on blood (Stomoxyni) or on exuding (animal) wound liquor *(Hydrotaea);* the latter two groups are vectors of diseases. *Musca autumnalis* De Geer is a species that can occur indoors in large numbers from late summer onward, seeking shelter for the winter.

Identification: Fonseca (1968), Pont & Grainger (2000), Pont & Horsfield (1989), Pont & Horsfield (1992), Pont *et al.* (1994), Roper *et al.* (1999), Skidmore & Pont (1999)

Mycetobiidae

NEMATOCERA, Psychodomorpha, Anisopodoidea
Number of British species: 3 **Size:** S **Difficulty:** 2

Characters: Small to medium sized (4-7 mm), dark coloured Nematocera. Head small and almost spherical; ocelli present; eyes almost holoptic; antenna with 16 simple, uniform segments. Wing clear, with anal lobe. Legs rather sturdy but long, often less dark; coxae elongated; tibiae with apical bristles or spurs.



Mycetobia pallipes male

Biology: The larvae usually occur in small groups and are found in moist habitats in rotting or fermenting organic matter, such as underneath the bark or in wood of dead deciduous and coniferous trees, in exuding tree sap, in rot holes filled with organic matter, etc. The adults mainly occur near the larval habitats.

Identification: Coe *et al.* (1950), Hancock *et al.* (1996)

Mycetophilidae

Fungus-gnats

NEMATOCERA, Bibionomorpha, Sciaroidea

Number of British species: 457 **Size:** T–S **Difficulty:** 3–4 Scheme



Mycetophilidae

Characters: Slender to relatively stout Nematocera, minute to large (2-15 mm) but more usually small to medium sized (4-8 mm). The colour varies from pale, dull yellow to brown or black. Head small; eyes dichoptic; 2 or 3 ocelli present; antenna usually with 16 segments but sometimes segments close together resembling a single third segment; mouthparts short, usually half as long as the height of the head, but sometimes longer or even extremely elongate as in *Gnoriste*. Thorax vaulted. Wing usually clear, in some cases tinged or with markings; venation characteristic (vein CuA_1 and stem of veins M_1 and M_2 not connected or connected as far up as crossvein H); anal lobe absent or weak. Legs with elongate coxae; tibiae with long apical spurs.

Biology: The larvae of most species feed on mushrooms, bracket fungi or mycelium in moist, dead wood or in other moist organic substrates. They rarely are predators or feed on organic detritus in nests of birds, on mosses or on liverworts (Hepaticae). Some larvae live in a web they have spun themselves underneath tree trunks, bark, mushrooms and bracket fungi, etc. The adults ("fungus gnats") occur chiefly in moist habitats, in woodlands in particular although some species prefer rather different habitats like grassland, marshes moist heather, etc. They often are active in the evening while during the day they hide in dark and shaded spots; some species are mainly found in caves and in burrows of rodent. Some species visit flowers and are important as pollinators of certain plants.

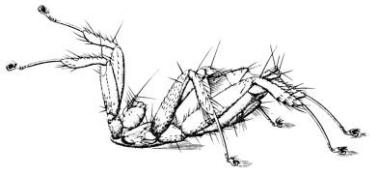
Identification: Chandler (1976), Chandler (1977a), Chandler (1977b), Chandler (1977c), Chandler (1978b), Chandler (1978c), Chandler (1980), Chandler (1981), Chandler (1987b), Chandler (1988), Chandler (1991), Chandler (1992b), Chandler (1992d), Chandler (1993), Chandler (1994a), Chandler (1994b), Chandler (1999f), Chandler (Unpublished), Edwards (1913), Edwards (1925), Edwards (1941), Gagné (1981), Väisänen (1984)

Nycteribiidae

Batlice-flies

BRACHYCERA, Muscomorpha Schizophora Calyptratae, Hippoboscoidea

Number of British species: 3 **Size:** M **Difficulty:** 2



Phthiridium biarticulatum female

Characters: Minute to medium sized (1.5-5 mm), yellowish to brown, spider-like, flattened flies without wings. Halteres present. Head small, not adpressed to the thorax but, in resting position, bent backward on to thorax eyes and ocelli small or absent. Legs long with swollen femora and tibiae; first tarsal segment at least as long as all other tarsal segments combined.

Biology: The adults are ectoparasites of bats, feeding on their blood. The larvae develop inside the abdomen of the female fly. Just prior to deposition the female leaves her bat host and glues the mature, almost pupated larva (prepupa) to a solid substrate near the resting place of the bats after which the prepupa fairly rapidly forms a puparium. Nycteribiidae show various degrees of host specificity, ranging from species-species associations, through associations with closely related hosts to apparent absence of any host preference.

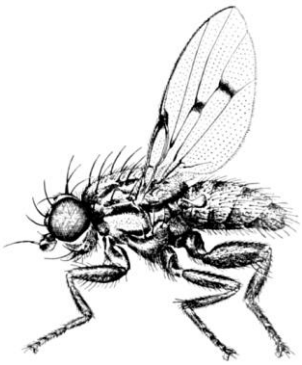
Identification: Hutson (1984)

Odiniidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Opomyzoidea
Number of British species: 9 **Size:** S **Difficulty:** 2–3

Characters: Small (2-5 mm), stout flies body usually grey with dark markings, legs sometimes banded. Arista pubescent; ocelli present; Ocellar bristles present; Postvertical bristles diverging; 3 pairs of frontal bristles, the lower pair curving inward, the other pairs backward; interfrontal bristles absent; vibrissae present. Wing usually clear with markings along the crossveins and near the subcostal break; vein Sc incomplete; crossvein BM-Cu present; cell cup closed. Dorsal preapical bristle on the tibiae often thin, hair-like, in some cases similar to the other hair-like bristles.


Odinia maculata



Biology: The larvae usually live in association with woodboring insects and may be found in tunnels and underneath the bark of deciduous and coniferous trees. The earlier instars feed on exuding juices and insect frass, the later instars prey on other insects living in wood. The adults live in the vicinity of the larval habitats, in particular near tree wounds or on wood-associated mushrooms and bracket fungi.

Identification: Cogan (1969), Collin (1952), MacGowan & Horsfield (2002), MacGowan & Rotheray (2002)

Oestridae

Warble-flies, Bots

BRACHYCERA, Muscomorpha Schizophora Calyptratae, Oestroidea Scheme
Number of British species: 11 **Size:** M–L **Difficulty:** 2

Characters: Medium sized to large flies (9-18 mm). Body largely without bristles, nearly bare, or body and legs covered in a soft pilosity, making these insects resemble bees or bumblebees. Mouth opening small, mouthparts rudimentary; antenna small; ptilinal suture usually with the ends converging below the antennal insertions. Lower calypter large. Vein M_1 strongly curving or with an angle in the direction of the wing margin or ending in vein R_{4+5}; in the latter case cell r_{4+5} petiolate. Subscutellum flat or strongly swollen; meron in some cases with bristles along its hind margin, near the posterior spiracle (often difficult to see because of the dense pilosity).


Reindeer bot fly *Cephenemyia trompe*



Biology: The larvae are parasites in the nostrils or nasal cavities of mammals, especially sheep and goats but also occasionally antelopes, deer, camels and horses. The host relation is rather specific. Oestridae are larviparous which means that larvae (instead of eggs) are deposited into the nostrils of the host, usually from a distance. The female hovers just in front of the host and ejects the larvae into the host's nostrils. The larvae migrate to the nasal cavities and, in most cases, later into the pharynx. Fullgrown larvae leave their host through the nostrils or mouth opening and pupate in the soil. The adults have reduced mouthparts and do not feed. They seem to be rather inactive insects and are relatively rarely observed. A conspicuous phenomenon in this family is hilltopping, i.e., the habit of the adults seeking out high places or landmarks, in order to raise the chances of males and females meeting each other.

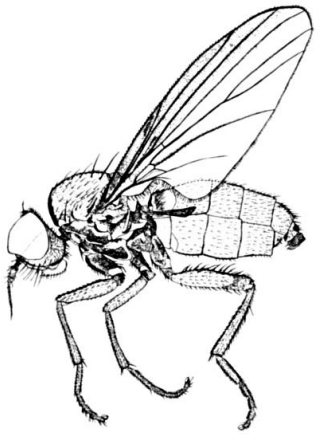
Identification: Emden (1954), Zumpt (1965)

Opetiidae

BRACHYCERA, Muscomocpha Aschiza, Platypezoidea
Number of British species: 1 **Size:** S **Difficulty:** 2 Panel

Characters: A small (2-5 mm), slender, all dark species with a characteristic wing venation. Male with holoptic eyes; antenna with elongate second and third segments, arista long, terminal. Wing darkened along the costa, in particular in the male; vein Sc reaching the wing margin; crossvein DM-Cu absent; vein M with a long fork; small cell cup narrowing to a point; anal lobe large in the male, virtually absent in the female. Legs slender, simple.

Biology: The only European species, *Opetia nigra*, has been reared from a piece of birch wood in an advanced state of decay. The ovipositor is peculiarly shaped, suggesting a specialised mode of ovipositing and a distinctive larval habitat. The adults often occur in wooded areas but in open habitats as well. Adult males are often found on leaves of trees and bushes, the much less frequently found females in lower vegetation. It appears that nectar feeding may occur. The males sometimes congregate in swarms.



Opetia nigra male

Identification: Chandler (2001c)

Opomyzidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Opomyzoidea
Number of British species: 17 **Size:** S **Difficulty:** 2–3 Panel

Characters: Small (2-5 mm), slender, yellow, brown, reddish or black coloured flies. Arista pubescent or with relatively long rays; ocelli present; Ocellar bristles present Postvertical bristles absent; 1 pair of frontal bristles, curving backward scattered interfrontal setulae present; vibrissae absent although *Geomyza* with a strong bristle near the vibrissal angle. Wing nearly always with an apical spot and/or darkly marked crossveins or marked all over; costa with a subcostal break; vein Sc usually incomplete but apical part sometimes visible as a thin line reaching the costa; crossvein BM-Cu present but usually incomplete; cell cup closed. Tibiae without dorsal preapical bristle.

Biology: In view of the larval food plants, i.e., grasses, the adults are mainly found in open habitats. The larvae live in the stems of grasses, a few species being a pest in agriculture.



Geomyza tripunctata female

Identification: Drake (1992), Drake (1993), Drake (2001)

Pallopteridae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Tephritoidea
Number of British species: 13 **Size:** S **Difficulty:** 1 Scheme

Characters: Small to medium sized (2.5-7 mm), slender flies varying in colour from pale yellow to reddish, grey or black; some parts of the head often silvery grey to white. Arista bare or with short rays, rays at most twice as long as basal diameter of arista; ocelli present; Ocellar bristles present; Postvertical bristles parallel to somewhat diverging; 1 pair of strong frontal bristles, curving backward, sometimes with a weaker F-bristle in front; scattered interfrontal setulae present, sometimes almost invisible or indeed lacking; vibrissae absent but usually a series of fine setulae present along the lower margin of the genae. Wing often with a pattern, seldom clear; costa weak just beyond crossvein H and with a subcostal break; vein Sc complete; crossvein BM-Cu present; cell cup closed. Tibiae without dorsal preapical bristle, except in *Eurygnathomyia.*



Palloptera



Biology: In some species the larvae live under tree bark where they feed on mycelium or prey on beetles (Carabidae, Cerambycidae and Scolytidae). Larvae of other species live in plants, such as grasses, Apiaceae or the flower heads (inflorescences) of Asteraceae (Compositae); it is unknown whether the species living in plants are really phytophagous, carnivorous, or both. The adults are generally found in shaded habitats often near water. Depending on the larval habitat, the adults are found on flowers, often those of umbellifers, or on tree trunks and leaves.

Identification: Cogan & Dear (1975), Collin (1951), Rotheray & MacGowan (1999)

Pediciidae

Hairy-eyed Craneflies

NEMATOCERA, Tipulomorpha, Tipuloidea
Number of British species: 19 **Size:** M–L **Difficulty:** 1–2 Scheme

Characters: Nematocera varying from medium sized (5 mm in *Dicranota,* subgenus *Paradicranota)* to very large (35 mm in *Pedicia).* Antennae, wings, legs and abdomen long and slender. Ocelli absent; eyes pubescent, with ommatrichia in between the facets; antenna with 12-17 segments. Thorax with a V-shaped transverse suture. Wing with 2 anal veins, wing in some cases with a characteristic pattern.



Pedicia rivosa

Biology: The larvae of the genus *Ula* feed on mushrooms and bracket fungi; all other larvae, as far as known, are aquatic to semi-aquatic and prey on worms, insect larvae, mites and other small invertebrates. Predatory larvae are mobile and rapidly moving; because of their massive head capsule they are not able to swallow large prey as they are but have to tear them to pieces. Of the three more common genera, the larvae of *Tricyphona* are found in diverse wet and semi-aquatic habitats (from the shores of springs, streams and lakes to bogs and forest litter in wet places), those of *Dicranota* tend to occur along and in running waters but develop also at the shores of standing water bodies; larvae of *Pedicia* are restricted to running water of wells, brooks and small rivers. Pupating takes place inside a silken tube. Adults are found in an array of moist habitats.

Identification: Coe *et al.* (1950), Edwards (1938a), Stubbs (Unpublished)

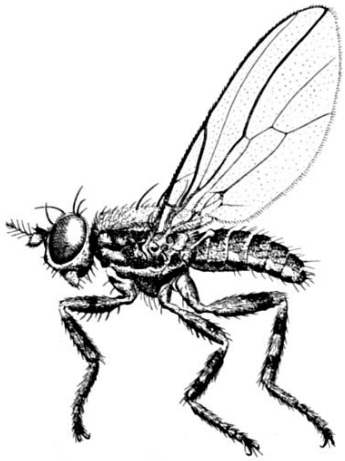
Periscelididae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Opomyzoidea
Number of British species: 3 **Size:** S **Difficulty:** 3

Characters: Minute to small (1-5 mm), grey or dark coloured flies, often with banded legs. Antenna with second segment overhanging third segment; arista with long rays; ocelli present; Ocellar bristles present; Postvertical bristles diverging; 1 pair of frontal bristles, curving backward; interfrontal bristles absent; a row of vibrissa-like bristles present. Wing clear or with infuscated spots; Costa continuous; vein Sc incomplete; crossvein BM-Cu present; cell cup open or closed. Tibiae without dorsal preapical bristle.

Biology: The larvae of this small family live in sap exuding from deciduous trees. The adults are often found near the larval sites and feed on tree sap. Males may be seen hovering near sap runs.

Identification: Duda (1934)



Periscelis annulata female

Phaeomyiinae (subfamily of Sciomyzidae) Millipede-killing Flies

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Sciomyzoidea
Number of British species: 2 **Size:** M **Difficulty:** 1 Scheme

Characters: 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, crossvein BM-Cu present; cell cup closed. Tibiae with dorsal preapical bristle.

Biology: One species in this small subfamily is known to be 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.

Identification: Ball & McLean (1986), Rozkošný (1984), Rozkošný (1987)



Pelidnoptera nigripennis

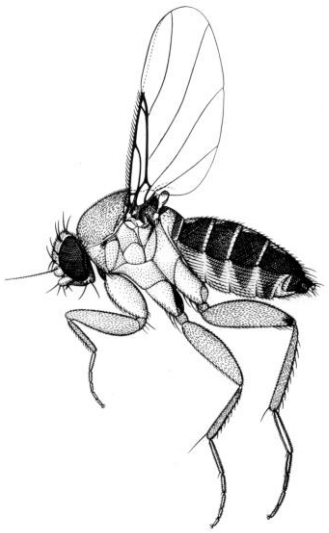
Phoridae

Scuttleflies

BRACHYCERA, Muscomocpha Aschiza, Platypezoidea
Number of British species: 326 **Size:** T–S **Difficulty:** 2–4

Panel

Characters: Minute to medium sized (0.5-6 mm) flies, often somewhat arched and more or less stout, with a characteristic wing venation. Head, palps and legs usually with strong, dentate or feathered setae. The body colour varies from black through brown, orange and yellow to pale grey or pale white. Eyes dichoptic; antenna with a large, rounded or elongate third segment bearing a long apical or somewhat dorsal arista directed sideways. Wing clear or tinged, rarely with markings; venation reduced, the strong R-veins ending in the costa about halfway up the wing; the other veins are weaker and usually follow a diagonal course, often parallel to each other. Legs typically with stout femora; hind femora often somewhat laterally compressed.



Megaselia scalaris

Biology: Rather variable, showing the greatest diversity of all Dipterous families. Larvae are found in several terrestrial habitats, in the nests of social insects and in some aquatic habitats, feeding on organic detritus such as dung, carrion, insect frass, dead snails, etc.; some feed on bracket fungi and mushrooms, on mycelium or on living plants (among others as miners), they may be predators or parasites of a wide array of organisms such as earthworms, snails, spiders and their eggs, centipedes, millipedes insect larvae and pupae. Most adults feed on nectar, honeydew and juice exuding from fresh carrion and dung; some feed on body juices of living beetle larvae and pupae, others prey on small insects. The adults are conspicuous on account of their fast and somewhat abrupt manner of locomotion. In some species, the males fly in swarms.

Identification: Buck & Disney (2001), Disney (1983), Disney (1984), Disney (1987), Disney (1989), Disney (1990), Disney (1991), Disney (1993), Disney (1994), Disney (1995), Disney (1997), Disney (1999b), Disney (2000a), Disney (2000b), Disney (2001), Disney (2002a), Disney (2002b), Disney (2002c), Disney & Beuk (1997), Disney & Chapman (2001), Disney & Perry (2000)

Piophilidae

Skippers

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Tephritoidea
Number of British species: 14 **Size:** S **Difficulty:** 2–3

Characters: Minute to medium sized (1.5-7 mm), yellow or brown to black, in some cases lustrous flies, some species with a striking pale coloration of the face or with more or less extensive yellow or reddish coloured parts. Arista bare to pubescent; ocelli present; Ocellar bristles present; Postvertical bristles diverging, rarely parallel; 0-4 pairs of frontal bristles, if present curving outward or backward, in *Actenoptera* the lower 2 pairs curving inward; scattered interfrontal setulae present; vibrissae present. Wing usually unmarked, in some genera with spots along the crossveins and/or at the ends of the longitudinal veins; Costa with a subcostal break; vein Sc complete; crossvein BM-Cu virtually always present; cell cup closed. Tibiae without dorsal preapical bristle.



Piophila casei

Biology: The larvae of most species live in rotting wood, bracket fungi, or mushrooms, some species live in nests of birds where they feed on the blood of the nestlings *(Neottiophilum)*, or in carrion, mainly that of larger vertebrates *(Thyreophora* and its allies), or in substrates rich in protein. A well-known representative of the latter group is the larva of *Piophila*

casei (Linnaeus), a pest in a large variety of animal products such as cheese, dried fish, meat, etc. The adults are not very active fliers and are mainly found near the larval habitats for oviposition or on tree trunks and logs, possibly for mating.

Identification: Cogan & Dear (1975), Czerny (1930), McAlpine (1977), Stubbs & Chandler (2001)

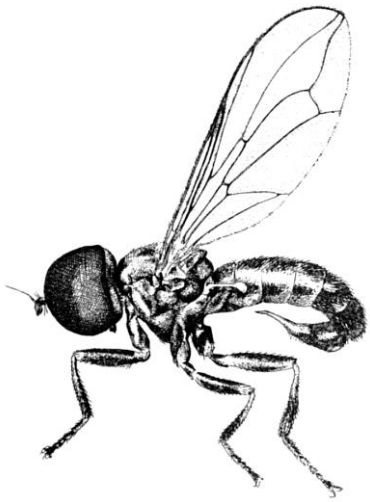
Pipunculidae

Big-headed Flies

BRACHYCERA, Muscomocpha Aschiza, Syrphoidea

Number of British species: 93 **Size:** S–M **Difficulty:** 2–4 Study group

Characters: Small to large (2-12 mm), dark coloured flies with long, narrow wings and very large eyes occupying nearly all of the semi-spherical to nearly entirely spherical head. Antenna short, third segment usually the largest, with a dorsal arista or style; mouthparts small. Wing clear or tinged brown; vein M_1 and cell dm sometimes absent; cell cup elongate, ending acutely just before the wing margin. The female has a lance-like ovipositor.



Pipunculus

Biology: The larvae are predominantly parasitoids of leafhoppers and planthoppers (Hemiptera: Auchenorrhyncha) except *Nephrocerus* which has been reared from adult Tipulidae (Koenig & Young 2007). The large eyes of the adult pipunculids apparently play an important role in locating a suitable host, as does the ability to hover in one spot. Once located, the female uses her lance-like ovipositor to deposit an egg directly inside the host. More than one larva may be present in a single host. When nearing completion of development, the larvae eat the host until only an empty shell remains. The larvae then leave through the cuticle to pupariate in the soil.

Identification: Ackland (1993b), Ackland (1999), Ackland (2002), Albrecht (1979), Coe (1966), Jervis (1992), Stubbs (1980)

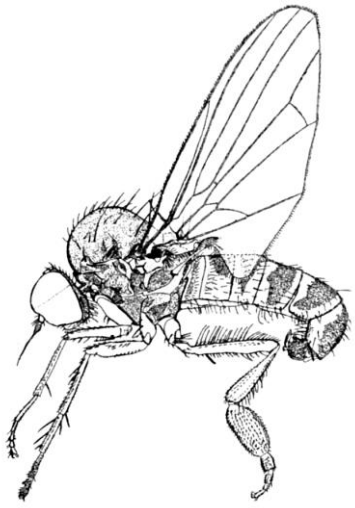
Platypezidae

Big-footed Flies

BRACHYCERA, Muscomocpha Aschiza, Platypezoidea

Number of British species: 33 **Size:** S **Difficulty:** 2–3 Panel

Characters: Minute to medium sized (1.5-6 mm), slender to stout flies, male and female often differing in colour, the male in particular often all black; one or both sexes partially to all grey or yellow, in some cases with orange, grey or silvery markings, or abdomen bicolourous. Eyes holoptic in the male; antenna with 3 segments, the third of which is largest and bears a long, apical arista. Wing clear or tinged, in some genera the area along the wing margin, in between and around veins Sc and R_1 darkened; wing with conspicuous anal lobe; anal vein reaching the wing margin; cell cup ending in an acute angle, often elongate; in most genera vein M forked; crossvein DM-Cu virtually always present (absent in *Microsania* where crossvein R-M is also lacking). Legs relatively short, stout; first tarsal segment of hind leg in the subfamily Callomyiinae long and cylindrical, usually swollen in the male, slender in the female the subsequent tarsal segments cylindrical; in the subfamily Platypezinae the first tarsal segment of hind leg short, laterally compressed, subsequent tarsal segments laterally compressed as well, in particular in the female.



Agathomyia male

Biology: As far as known the larvae develop on and in mushrooms and

bracket fungi. The adults are mainly found in woodland areas, walking about on leaves of trees and shrubs where they feed on honeydew and other organic matter on the leaf surface. The males sometimes fly in swarms; those of *Microsania* are known as 'smoke flies' since they swarm in the smoke of forest fires (and other fires as well). The larval mode of life of *Microsania* is not known.

Identification: Chandler (1973), Chandler (1974), Chandler (2001c), Chandler (2002c), Chandler (2002d), Ismay (2002)

Platystomatidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Tephritoidea
Number of British species: 2 **Size:** S–M **Difficulty:** 1 Scheme

Characters: Small to large (3-11 mm), dark flies, in *Platystoma* with brown wings with numerous hyaline dots and stout, microtrichose body and usually bright yellow ventral part of abdomen, in *Ravellia* with dark banded or spotted wings and shiny, narrow body. Head round to distinctly flattened arista bare to pubescent; ocelli present; Ocellar bristles reduced or absent; Postvertical bristles reduced or absent; 1-2 pairs of frontal bristles; scattered interfrontal setulae present; vibrissae absent but sometimes vibrissa-like bristles present. Costa with a humeral break, otherwise continuous; vein Sc complete, crossvein BM-Cu present; cell cup closed. Tibiae without dorsal preapical bristle. Female with oviscape, non retractable basal segment of the ovipositor.



Platystoma seminationis

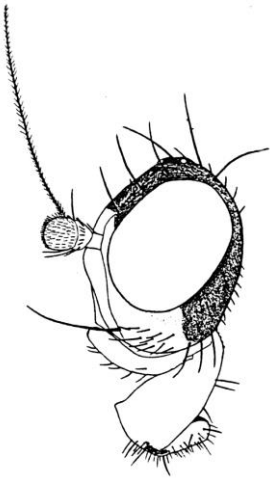
Biology: The larval habitats are rather diverse, most species feeding on rotting plant materials or on roots in the soil, some species living under the bark of deciduous trees; larvae of *Rivellia* feed on the root nodules in legumes. The adults are also found in various habitats such as woodland, moist meadows dunes, etc., often resting on tree trunks, stones and leaves, in the latter case preferring the lower side. The adults feed on the juice exuding from dung and carrion, on nectar, honeydew, fruit and on sap exuding from tree wounds.

Identification: Clements (1990)

Pseudopomyzidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Nerioidea
Number of British species: 1 **Size:** S **Difficulty:** 2 Study group

Characters: A minute to small (1.7-2.5 mm), dark to black coloured species. Arista pubescent; ocelli present; Ocellar bristles present; Postvertical bristles converging; 3 pairs of frontal bristles, curving backward; interfrontal bristles absent; vibrissae present. Wing unmarked, costa with both subcostal and humeral breaks or a subcostal break and a humeral weak spot; vein Sc incomplete; crossvein BM-Cu absent; cell cup closed. Tibiae without dorsal preapical bristle.



Pseudopomyza atrimana

Biology: The biology of this small family is little known. The only European species, *Pseudopomyza atrimana*, occurs in woodland habitats, and adults have been recorded to gather over rotting logs, a habitat similar to that of an East Asian species whose larvae were found living under bark of various trees.

Identification: Chandler (1983)

Psilidae

Rust flies

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Diopsoidea

Number of British species: 26 **Size:** S–M **Difficulty:** 2 Study group

Characters: Small to medium sized (1.5-10 mm), slender to stout, yellow to reddish, brown or black coloured flies with few bristles. Head with relatively small eyes, most often with receding face; antenna small or with third antennal segment conspicuously elongate; arista short or longer pubescent; ocelli present; Ocellar bristles present; Postvertical bristles diverging or absent; 0-2 pairs of frontal bristles; scattered interfrontal setulae present; vibrissae absent. Wing usually clear to slightly tinged rarely marked, in some cases along costa, the wing tip or the crossveins with dark band(s); wing with a transverse weakening in basal half; costa with a subcostal break at some distance from where vein R_1 meets the costa; vein Sc incomplete its apical part transparent and more or less perpendicular to the basal part; crossvein BM-Cu present; cell cup closed. Tibiae without dorsal preapical bristle.



Psila merdaria male



Loxocera

Biology: The larvae are nearly all phytophagous. They live in roots, tubers and stems of a range of non-woody herbs, a few species live under tree bark. Several species are pests in agriculture and horticulture (such as the root fly *Psila rosae* Fabricius, living in several crops nearly all over the world; and *Psila nigricornis* Meigen which inhabits the roots of chrysanthemums and other garden plants). The adults prefer a low, dense vegetation.

Identification: Collin (1944a)

Psychodidae

Owlet-midges, Mothflies

NEMATOCERA, Psychodomorpha, Psychodoidea

Number of British species: 95 **Size:** T **Difficulty:** 3–4 Panel

Characters: Small to medium sized (2-6 mm), often stout, usually densely pubescent Nematocera non-piercing except for the subfamilies Sycoracinae and Phlebotominae. Ocelli absent; in the Psychodinae, the largest and most common subfamily, the eyes are reniform and with an eye bridge, eyes circular in the other subfamilies antenna usually with 12 to 16 segments, the flagellomeres bottle- or barrel-shaped. Wing hairy, with 9- longitudinal veins and the R-fork and M-fork always present, though they may be incomplete basally; crossveins situated near the wing base or (partly) absent; wing usually acute, in Trichomyiinae, Sycoracinae and some Psychodinae wing rounded. While resting or walking the wings are hold above the abdomen like a roof, or besides the abdomen in a broad V-shape. Legs ranging from short to elongate.



Psychodidae

Biology: The larval habitats of the five European subfamilies are rather diverse (and in some cases insufficiently known) but truly aquatic species are lacking. The larvae of the Phlebotominae are known from soil dug up from rodent burrows. Those of the Sycoracinae are semi-aquatic in mosses, spring brooks, or waterfalls and fast streams where they live on rocks near the surface or in the splash zone. Those of the Trichomyiinae and probably the Bruchomyiinae live in rotting and dead wood of deciduous trees. The larvae of the Psychodinae occur in a wide range of habitats: semi-aquatic, water-filled tree holes, leaf axils, kitchen sink deposit catchers, water purification plants (where they can be a pest), or more terrestrially in humus and leaf litter, as miners in leaves, in excrement, in public lavatories and toilets, in sand and mud alongside

water, in moss mushrooms and bracket fungi, in dead wood, etc. The adults have a short and erratic flight and are largely found in woodland areas near water, in marshland, or near (indoor) larval habitats. They are predominantly nocturnal and by day they rest in dark places. Certain species are regularly found on window panes at dusk or occasionally swarm round sink overflows. Mouthparts are non-functional except in females of the Sycoracinae, which feed on the blood of amphibians, and the Phlebotominae, the "sand flies" which feed on human blood and, in the tropics, can be important disease vectors. Some Psychodinae do occasionally become a nuisance if they, for example, breed in numbers in domestic drains.

Identification: Coe *et al.* (1950), Withers (1989), Withers (1991), Withers (1997), Withers (2002)

Ptychopteridae

NEMATOCERA, Ptychopteromorpha, Ptychopteroidea

Number of British species: 7 **Size:** M **Difficulty:** 1 Scheme

Characters: Medium sized to large (7-15 mm), slender, black lustrous Nematocera, often with lighter markings on thorax and/or abdomen. Antennae, wings, abdomen and legs long and slender. ocelli absent; antenna with 15 to a segments. Thorax with deep, posteriorly directed transverse suture. Wing with markings, in particular along the crossveins and where veins bifurcate; spurious vein present on either side of crossvein R-M and wing membrane with a distinct fold between veins Al and CuA_2.



Ptychoptera

Biology: The larvae are aquatic to semi-aquatic, living in muddy water, shallow pools in marshes, Sphagnum pools, or the margins of streams. They filter-feed on small organic particles. They are connected with the air through a long ventilation tube at the end of the abdomen. The adults live in marshy and moist habitats, near suitable substrates for the larvae as well as quite some distance from the larval habitat.

Identification: Coe *et al.* (1950), Stubbs (1993)

Rhagionidae

Snipeflies

BRACHYCERA, Tabanomorpha, Tabanoidea
Number of British species: 15 **Size:** S–L **Difficulty:** 1 Scheme

Characters: Small to large (2-20 mm) flies with long wings, legs and abdomen. Body bare or partially pubescent, rarely with a few bristles. Body colour yellow, yellowish brown or black, often with a brownish, grey or dark pattern. In male eyes generally nearly or entirely holoptic; third antennal segment swollen and with a dorsal or terminal style or arista; mouthparts usually fleshy. Wing usually clear and with a dark stigma spot, in some cases with a distinct pattern; wing venation usually with 3 veins from the discal cell in the direction of the wing margin; cell m_3 open; cell cup open or closed. Legs simple apical spurs on the tibiae variable, however, mid leg virtually always with 2 apical spurs; empodium pulvilliform.



Rhagio tringarius



Chrysopilus cristatus female

Biology: The larvae of most species breed in moist soil, some are found in mosses, liverworts, etc., with the larvae of many *Chrysopilus* species breeding inside decaying wood of deciduous trees. The larvae prey on insect larvae, worms and other invertebrates; some species are known to feed on organic detritus and carrion. The adults are generally less abundant, being found in shaded habitats near the verges of woodlands and near bodies of water. Some Rhagionidae, including the well known *Rhagio scolopaceus* (Linnaeus), are often seen on leaves tree trunks and other vertically oriented objects. *Symphoromyia* species are known to feed on blood of mammals. Most of the other species feed on nectar, pollen and honeydew in the adult stage; many species are presumed to prey as well on small insects and other invertebrates.

Identification: Drake (1991), Oldroyd (1969), Stubbs & Drake (2001)

Rhinophoridae

BRACHYCERA, Muscomorpha Schizophora Calyptratae, Oestroidea
Number of British species: 7 **Size:** M **Difficulty:** 2

Characters: Small to large (2-11 mm) flies, often with many bristles; usually grey to black with some pruinosity or brownish yellow. Arista bare to plumose. Wing in some cases distinctly marked; vein M_1 always curving forward; cell r_{4+5} sometimes petiolate. Lower calypter always small, ovoid, spoon-shaped, erect, laterally extended (i.e., not recumbent on the thorax). Subscutellum narrow and distinct, only weakly convex; meral bristles always present although fewer in number and less strong than in related families; posterior spiracle with a lining of long hair-like bristles, without lappets.



Paykullia maculata female

Biology: As far as known, the larvae live as endoparasitoids in terrestrial woodlice (Isopoda: Oniscidea). The eggs are deposited on trees, walls, underneath stones, etc., and after hatching the young larva actively searches for its host. Pupation takes place within the exoskeleton of the woodlouse which by that time is no more than an empty shell. The adults are often found at sunlit spots, on walls, flowers, windows, etc.

Identification: Bedding (1973), Emden (1954)

Sarcophagidae

Fleshflies

BRACHYCERA, Muscomorpha Schizophora Calyptratae, Oestroidea

Number of British species: 60 **Size:** S–L **Difficulty:** 2–3 Panel



Sarcophaga

Characters: Small to very large (3-22 mm), usually stout and bristly flies. Most species grey to greyish black with a characteristic, shifting, checkered pattern on their abdomen; some species yellow-grey, green-grey or almost entirely black lustrous, never metallic blue or green. Arista bare to plumose. Wing usually hyaline, sometimes infuscated anteriorly or variously ornamented with dark markings; vein M_1 always curving forward, sometimes ending in vein R_{4+5} at the wing margin or before, making cell r_{4+5} petiolate. Lower calypter usually broadly rounded-triangular, in a very few cases smaller and more or less round to elliptical. Subscutellum narrow and flat, not swollen; metal bristles always present; posterior spiracle covered by an anterior and posterior lappet, usually the anterior lappet a narrow fringe and the posterior one forming an operculum.

Biology: The life mode of the larvae is most variable: brood parasitoids of Hymenoptera such as Sphecidae, Pompilidae and, in the Miltogramminae, Apoidea; feeding on excrement (coprophagous larvae); inquilines preying on larvae and pupae of bumblebees and social wasps; feeding on carrion (necrophagous larvae) of fish, crustaceans, amphibians, reptiles, birds and mammals; necrophagous with all transitional stages into endoparasitism on grasshoppers, beetles and caterpillars and pupae of butterflies, on true bugs (Hemiptera), sawflies and wood wasps (Hymenoptera: Symphyta), on centipedes and millipedes, on earthworms and snails; parasitoids in pupae of Lepidoptera and Hymenoptera: Symphyta, on egg clusters of grasshoppers and spiders, on eggs of reptiles (including those of lizards); facultative and mandatory agents of myiasis in vertebrates and man. Adults can be found in a wide range of habitats; some species prefer coastal habitats. The males in particular often visit flowers.

Identification: Chandler (1999d), Emden (1954), Pape (1987), Wyatt (1991), Wyatt & Falk (1995), Wyatt & Sterling (1998)

Scathophagidae

Dungflies

BRACHYCERA, Muscomorpha Schizophora Calyptratae, Muscoidea

Number of British species: 54 **Size:** S–M **Difficulty:** 2 Scheme



Scathophaga stercorarea

Characters: Small to large (3-12 mm), usually slender flies. Colour ranging from a dull yellowish brown to lustrous black or yellow, in some species bicolourous. Body and legs often with many bristles, sometimes densely covered by fine hairs. Occiput usually with some to many pale, longhairs; arista bare to plumose; interfrontal bristles absent. Wing usually clear, sometimes distinctly marked or darkened at the tip or along the crossveins; anal vein long, usually reaching the wing margin. Meron without bristles along the hind margin, near the posterior spiracle.

Biology: The biology of the species in this family varies widely. In most species the larvae are phytophagous; some are leafminers or living in flower heads (inflorescences), seed capsules, stems, etc. In other species the larvae feed or prey on small organisms in rotting organic matter such as seaweed nesting material and dung; or they prey on eggs of aquatic insects. The adults prey mainly on small soft bodied insects and other organisms. Some species are attracted to dung in considerable numbers.

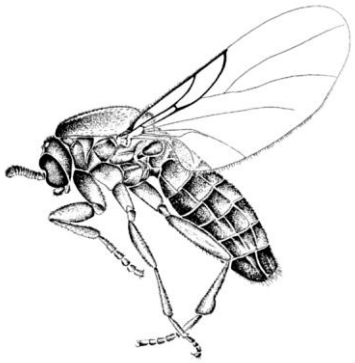
One of the best-known examples of this family is *Scathophaga stercoraria* (Linnaeus). This species, of which the reddish brown, densely pilose males gather on cow dung, may be observed nearly all year round.

Identification: Ball (Unpublished), Collin (1958), Nelson (1992)

Scatopsidae

NEMATOCERA, Psychodomorpha, Scatopsoidea
Number of British species: 45 **Size:** T–S **Difficulty:** 2–4

Characters: Minute to small (0.5-4 mm), stout Nematocera. Body colour dull or lustrous, dark to black, occasionally with lighter spots or more reddish. Ocelli present; eyes reniform and with an eye bridge present in almost all species; antenna short, with 7-12 segments, the terminal segment often somewhat longer. Wing short and wide, with an anal lobe, clear or slightly tinged; the R-veins well developed and ending far short of the wing tip, the other veins weaker. Legs relatively short and stout; tibiae without apical bristles or spurs.



Ectaetia clavipes female

Biology: The larvae live in rotting organic matter, in all sorts of substrates such as rotting plants, vegetables and fruits, in or underneath decaying wood and bark, rot holes in trees, soil, leaf litter, mushrooms and bracket fungi, dung, carrion, ants nests, etc. The adults are found in a wide range of habitats but generally prefer marshy and more open areas where they often visit flowers. Some species form swarms consisting of thousands of individuals on low vegetation and shrubs.

Identification: Chandler (1998c), Chandler (1999c), Freeman & Lane (1985), Laurence & James (1996), Peacey & Ismay (1998)

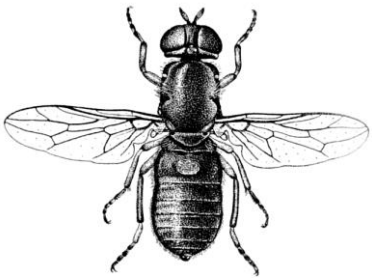
Scenopinidae

Windowflies

BRACHYCERA, Asilomorpha, Asiloidea
Number of British species: 2 **Size:** S **Difficulty:** 1

Scheme

Characters: Small to medium sized (2-7 mm) flies, usually dark coloured, stout and somewhat dorsoventrally flattened. Head and thorax pubescent devoid of bristles. Eyes nearly always holoptic in the male and consisting of two differently faceted parts; antenna usually oriented downward, with 3 segments; the third segment is the largest and in some cases split at the end and/or bearing a minute style. Wing clear or tinged; vein M_1 curving well forward, ending in the costa before the wing tip, or in vein R_5; cell m_3 open; cell cup closed. Legs relatively short and powerful, empodium bristle-like or absent.



Scenopinus fenestralis female

Biology: The larvae live in a variety of dry substrates such as soil, dust, nests of birds and other animals, tunnels mined by beetles and other organisms, holes in wood, under bark, etc., where they prey on small invertebrates, in particular on mites and beetles. Two species with a world-wide distribution, including *Scenopinus fenestralis* (Linnaeus), are well-known predators of carpet beetles. The adults feed on nectar and visit flowers. Adults are not often encountered in the wild but more regularly found indoors on windows or in rooms with lots of dust and dry organic matter (disused rooms attics, church towers).

Identification: Drake (1991), Oldroyd (1969), Stubbs & Drake (2001)

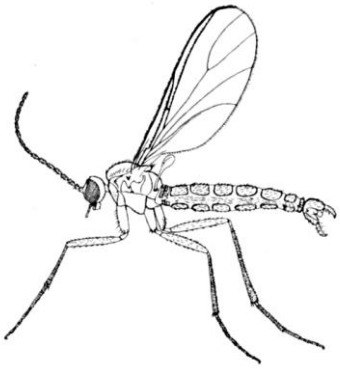
Sciaridae

Black fungus-gnats

NEMATOCERA, Bibionomorpha, Sciaroidea

Number of British species: 156 **Size:** S **Difficulty:** 3–5

Characters: Delicate, often black or rarely black and yellow to orange coloured Nematocera, minute to medium sized (1-6 mm, rarely up to 10 mm). Ocelli present; eyes usually with an eye bridge; antenna with 16 simple segments. Wing clear, in some cases tinged; wing venation rather constant: Costa ending in between R_{4+5} and M_1, the only crossveins present are H and R-M; vein M forked at about half its length; CuA_1 and CuA_2 with a basal stem. Legs relatively long, tibiae with apical bristles or spurs.



Lycoriella solani male

Biology: The larvae are largely terrestrial but restricted mainly to wet habitats. They are an important faunal element in soil and litter layers, but can also be found in dead wood, excrement, mushrooms, bracket fungi etc.; a number of species develop in semi-aquatic habitats. Larvae of Sciaridae mainly feed on mycelium. A limited number of species feed on living plant tissues such as roots or, as miners, leaves and stems, or live in mushrooms and bracket fungi. Some species are pests in forestry, horticulture and agriculture, mainly in mushroom culture and in glasshouses. The larvae of some species inhabit caves, others live in colonies of social insects. Larvae may occur in very high densities; massive processions of 2 to 10 metres in length so-called "army worms", are well-documented. The adults are found in a wide range of habitats as well, mainly near the larval habitat. They are often found indoors, in which case they probably hatched from larvae that developed in potting soil of indoor plants.



Sciaridae

Identification: Freeman (1983), Freeman (1987), Freeman (1990), Hippa & Vilkamaa (1991), Hippa & Vilkamaa (1994), Laurence (1994), Laurence & James (1996), Menzel & Mohrig (2000)

Sciomyzidae

Snail-killing Flies

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Sciomyzoidea

Number of British species: 68 **Size:** S–L **Difficulty:** 1–2 Scheme

Characters: 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; crossvein BM-Cu present; cell cup closed. Tibiae almost always with dorsal preapical bristle.



Sepedon spinipes female

Biology: 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; 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.

Identification: Ball & McLean (1986), Cole (2003), Rozkošný (1984), Rozkošný (1987)

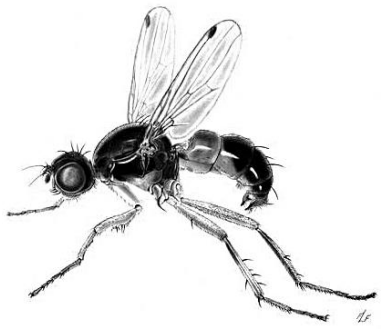


Limnia unguicornis male

Sepsidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Sciomyzoidea Scheme
Number of British species: 28 **Size:** S **Difficulty:** 2

Characters: Small to medium sized (2-6 mm), slender, ant-like flies with relatively few bristles or hairs. Body colour generally black, in some cases lustrous and/or with a distinct pattern of silvery pruinosity on the side of the thorax. In general, walking about on vegetation while waving their wings. An exception is *Orygma luctuosum* Meigen, a robust, hairy, somewhat flattened fly. The Sepsidae, including *Orygma*, are distinct from all other Acalyptrate flies on account of the presence of 1 or more bristles at the posteroventral margin of the posterior spiracle. Head rounded, arista bare; ocelli present; Ocellar bristles present; Postvertical bristles diverging or absent; 0-3 pairs of frontal bristles, if present curving outward or (obliquely) backward; interfrontal bristles absent, interfrontal setulae present in *Orygma*; vibrissae or vibrissa-like bristles usually present. Wing clear or tinged, often with a dark spot or clouding at the wing tip; costa continuous; vein Sc complete; crossvein BM-Cu present; cell cup closed. In the male femur and tibia of fore legs often with extrusions, spurs, teeth and the like. Tibiae usually with dorsal preapical bristle, but in several genera small or absent (e.g. *Meroplius*, *Nemopoda*, *Themira*).



Sepsis punctum male

Biology: The larvae of most Sepsidae largely develop in dung, excrement, rotting organic matter such as dead snails and insects, mushrooms and bracket fungi, in nests of birds, in soil rich in organic compounds, in compost, etc. The adults are generally observed near the larval habitats, usually in somewhat open habitats such as meadows, along watercourses, forest margins and clearings in woodland areas. Some species occur in major swarms on low vegetation and shrubs, waving their wings. These swarms can persist for over a month and are often accompanied by a certain odour. All this does not account for *Orygma luctuosum* which is a seaside species, to be found under cast up seaweed.

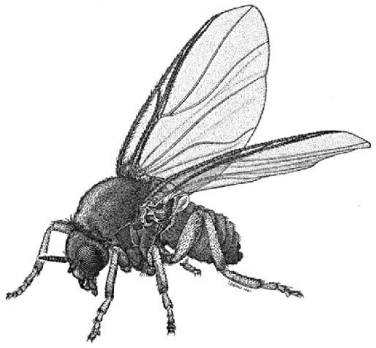
Identification: Pont (1979), Pont (1986), Pont & Meier (2002)

Simuliidae

Blackflies, Buffalo-midges

NEMATOCERA, Culicomorpha, Chironomoidea
Number of British species: 33 **Size:** T–S **Difficulty:** 3–5 Study group

Characters: Bloodsucking, minute to medium sized (1.2-6 mm), stout, usually dark coloured Nematocera. Eyes holoptic in the male, dichoptic in the female; ocelli absent; antenna short and stout, tapering toward the end, with 11, rarely 9 segments. Wing short and wide, with a distinct anal lobe; wing clear, in some cases slightly tinged; costa and R-veins stronger than the other veins; vein CuA_2 usually curving like an elongate, inverted S. Legs short and stout.



Simulium

Biology: The larvae are found in several types of running water, attached to a substrate like stones, metal objects, plastic bags, plants, branches, etc., at or above the bottom. They live on micro-organisms and small organic particles they filter from the water. Pupation takes place inside a cocoon. The adults feed on nectar and plant juices, females of a number of species feed on the blood of both cold-blooded and warm-blooded vertebrates and are known as 'black flies'. Feeding takes place in daylight, mainly during the morning and evening hours. In the tropics, but also in the tundra, taiga and some East European regions, Simuliidae can occur in such vast numbers as to interfere with, or entirely prevent, human activity.

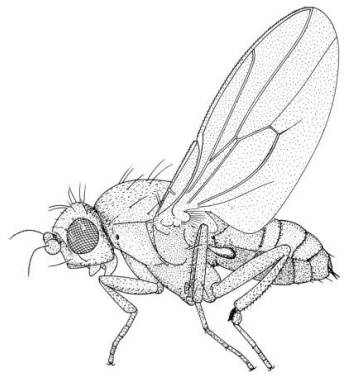
Identification: Bass (1998), Crosskey (1990), Crosskey (1991), Crosskey (1996), Crosskey & Crosskey (2002a), Crosskey & Crosskey (2002b), Davies (1968), Edwards *et al.* (1939)

Sphaeroceridae

Lesser-dungflies

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Sphaeroceroidea
Number of British species: 135 **Size:** T–S **Difficulty:** 3–4

Characters: Minute to medium sized (0.7-5.5 mm), stout, usually dull brown to black coloured flies, characterised by presence of vibrissae in combination with short, swollen first tarsal segment of the hind leg. Arista bare to long pubescent, ocelli virtually always present; Ocellar bristles present or absent; Postvertical bristles converging or absent; 1-2 pairs of frontal bristles, curving outward; interfrontal bristles present, partially in rows oriented inward; vibrissae present. Wing almost always without markings; Costa with breaks at the base, a subcostal break and in some cases a humeral break as well; vein Sc reduced; crossvein BM-Cu present or absent; cell cup open or closed. Tibiae with or without dorsal preapical bristle.



Opacifrons humida

Biology: The larvae live in a wide range of rotting organic materials and presumably feed on micro-organisms. They can be found in dung, manure dumps, leaf litter, organic matter washed up on the shore, mushrooms, bracket fungi, rotting vegetable matter, in caves, nests and other places inhabited by animals. The adults are mediocre fliers. They can be found on decaying matter of plant and animal origin, preferably in damp habitats; relatively many species live in caves or animal burrows. A few species occur near human settlements and, in case of mass occurrence in rotting substrates or in manure near human dwellings, they may become a nuisance because they usually also come indoors. Many species living in manure and dung are associated with hoofed animals and often form large populations on pastures and dung heaps near stables. The family shows a high percentage of species with reduced wings, or no wings at all.

Identification: Holmes *et al.* (1991), Pitkin (1988), Roháček (1982), Roháček (1983), Roháček (1984a), Roháček (1985), Roháček (1991), Roháček (1993), Roháček & Marshall (2000), Roháček & Munari (1993), Roháček & Valentine (2002)

Stenomicridae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Opomyzoidea
Number of British species: 2 **Size:** T **Difficulty:** 3

Characters: Minute (1-2 mm), delicate, yellow to grey flies with inner vertical bristles curving forward. Arista with long rays; ocelli present with the ocellar triangle situated more or less in middle of frons; Ocellar bristles absent; Postvertical bristles small and diverging or absent; 2 pairs of frontal bristles, lower pair curving inward; interfrontal bristles absent; vibrissae and a series of vibrissa-like bristles present. Wing clear or with tinged spots; costa with a subcostal break; vein Sc incomplete; crossvein BM-Cu absent; crossvein DM-Cu present or absent; cell cup open. Tibiae without dorsal preapical bristle.



Podocera delicata

Biology: The biology of this small family is little known. The larvae probably develop in the water-holding leaf bases of plants, particularly monocotyledons. The adults of some species often occur near water or at moist places and are closely associated with tussocks of large *Carex* species, others also with *Typha*, *Scirpus* or *Cyperus*. As in some Chamaemyiidae, the adults are able to walk sideways and backward with the same ease as forward.

Identification: Irwin (1982)

Stratiomyidae Soldierflies

BRACHYCERA, Tabanomorpha, Stratiomyoidea
Number of British species: 48 **Size:** S–L **Difficulty:** 1 Scheme

Characters: Small to very large (2-25 mm) flies of slender to stout shape, in some cases flattened. Body colour often striking: usually dark with conspicuous white, yellow, or greenish patterns, sometimes with blue to green metallic lustre. Eyes usually holoptic in male; antenna with 7-10 segments, varying between rather uniform to basal segments swollen and terminal segments making up the style; mouthparts often short, in some cases elongate. In most species scutellum with spinelike extensions. Wing usually clear, in some species with markings or partially much darkened; venation characteristic, e.g. R-veins in front part of the wing with vein R_5 almost always ending well before the wing tip; discal cell diamond-shaped, small to very small; cell m_3 open; cell cup closed. Legs simple, almost always without bristles, in a few species tibia of the mid leg with a single apical bristle; empodium pulvilliform.



Stratiomys potamida male



Chloromyia formosa female & male

Biology: Contrary to most other lower flies, the larvae of the Stratiomyidae are not predators or parasitoids. They are aquatic to terrestrial and mainly feed on algae and rotting organic matter, in most cases of vegetable origin. The aquatic habitats range from stagnant to running water, moist rock faces, on water vegetation, marshes, saline environments along the seaside or inland. Terrestrial larvae often occur underneath leaves and other rotting vegetable matter, in the topsoil, in some cases in dung, in ants nests and below the bark of trees. The adults feed on nectar and honeydew. They are frequent visitors to flowers and are also found sitting on leaves of herbs, shrubs, or trees. Preferred

habitats include woodland, the vicinity of water, dunes or other coastal habitats.

Identification: Drake (1991), Oldroyd (1969), Rozkošný (1982), Rozkošný (1983), Stubbs & Drake (2001)



Oxycera pardilina female

Strongylophthalmyiidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Diopsoidea

Number of British species: 1 **Size:** M **Difficulty:** 2 Study group

Characters: Small to medium sized (3.5-5.5 mm), slender, largely black flies with yellowish legs. Arista short pubescent; ocelli present; Ocellar bristles present; Postvertical bristles diverging; 2 pairs of frontal bristles; interfrontal bristles absent; vibrissae absent. Wing clear with vague markings in the central part or at the wing tip; Costa with a subcostal break; vein Sc incomplete; crossvein BM-Cu present; cell cup closed. Tibiae without dorsal preapical bristle.

Biology: The biology of the European species is little known. The larvae live under bark of dying or decaying deciduous trees, apparently with a preference for wet, dead ash wood. The adults occur on low vegetation in wet deciduous forests near the breeding sites of the larvae.

Identification: Cole (1981)



Strongylophthalmyia ustulata female, ©BMNH

Syrphidae Hoverflies

BRACHYCERA, Muscomocpha Aschiza, Syrphoidea

Number of British species: 274 **Size:** S–L **Difficulty:** 1–3 Scheme

Characters: Small to very large (3.5-35 mm), slender to stout flies, usually coloured black with white or yellow markings on head, thorax and especially abdomen; sometimes body largely brown, metallic yellow, green, or blue, or with a wide range of colours; in some cases strongly resembling bees, bumblebees, or wasps. Head large, without any distinct bristles, mostly consisting of eyes which are usually holoptic in the male. Third antennal segment usually the largest but sometimes first or second segment longer; third segment carrying an apical or dorsal arista or an apical style. Thorax with very few bristles. Wing usually clear, in some cases tinged or with markings; venation characteristic, virtually always with a spurious vein (vena spuria), less distinct or absent in *Eristalinus* and *Psilota*; vein M_1 not reaching the wing margin but curving strongly forward and ending in vein R_{4+5} before the wing margin; cell dm present, cell below cell dm open; cell cup elongate, ending acutely just before the wing margin. Legs usually slender and simple but sometimes, especially in the male, with coxa, trochanter, femur, tibia, or tarsus modified and/or bearing spurs.

Biology: The larvae can be divided into mycophagous and phytophagous species (including a number of species being pests in agriculture, especially bulb cultivation); predators of other insects (such as aphids,



Xanthogramma pedissequum female

ants, larvae of wasps or beetles, etc.), and species feeding on various types of organic detritus (decaying wood, sap exuding from tree wounds, organic detritus underneath tree bark or in nests of birds and other animals, leaf litter, liquid excrement or other organically enriched watery solutions). In some cases larvae of this latter group inhabit semi-aquatic to entirely aquatic habitats. The adults are common, conspicuous flies, to be found in various open to woodland habitats such as gardens, meadows, forest eaves, river banks, etc. They are able to hover in one place and are apparently capable of moving not only forward, but also backward and laterally. The adults feed on nectar and pollen, and several of the frequent visitors to flowers play an important part in pollinating certain plant species.

Identification: Ball & Morris (2000), Rotheray (1993), Speight (2002), Stubbs & Falk (2002)

Tabanidae

Horseflies

BRACHYCERA, Tabanomorpha, Tabanoidea

Number of British species: 30 **Size:** M–L **Difficulty:** 1–3 Scheme

Characters: Stout, medium sized to very large (6-30 mm) flies, devoid of bristles. Body generally brown, black or grey and with a pattern of lighter markings; in some cases body yellowish, greenish or metallic blue. Eyes in living flies often brilliantly reddish or metallic green, sometimes yellowish, often with spots or bands; eyes in male holoptic, in female dichoptic; antenna with 6 or more segments, usually with a large third segment and a tapering style; in most females the mouthparts constitute a powerful, often long piercing proboscis. Wing clear, or tinged, or with transverse bands, or darkened with distinct spots; the costa surrounding the wing entirely; fork of veins R_4 and R_5 usually strongly diverging with vein R_5 ending distinctly beyond the wing tip; cell m_3 open; cell cup open or closed. Lower calypter conspicuously large. Legs powerful, tibia of mid leg and in some cases hind leg with apical spurs; empodium pulvilliform.



Tabanus female

Biology: The larvae are aquatic, semi-aquatic or terrestrial (living mainly in soil and litter). In most genera they are predators but also able to feed as facultative saprophages. They prey on other invertebrates such as worms, snails and the larvae of other Diptera, including those of their own species. The adults are able fliers and especially active on warm, sunny days. In the majority of species the females feed on blood of mammals including humans; both sexes also feed on nectar and pollen. Some species show territorial behaviour, the males safeguarding their territories by hovering. As a consequence of their blood feeding habits and associated transmission of diseases, Tabanidae can be a serious problem locally for humans as well as cattle.

Identification: Chvála *et al.* (1972), Drake (1991), Edwards *et al.* (1939), Oldroyd (1969), Stubbs & Drake (2001)

Tachinidae

Parasite-flies

BRACHYCERA, Muscomorpha Schizophora Calyptratae, Oestroidea

Number of British species: 254 **Size:** S–L **Difficulty:** 2–4 Scheme

Characters: Small to large (2-20 mm) flies. Most species are grey to slate black, in some cases with yellow or red spots on the sides of abdomen; some species are metallic green or yellowish grey. Usually many bristles are present, some species may, however, be quite bare or show a bee-like pilosity. Arista usually quite bare, rarely plumose. Wing with vein M_1 usually strongly curved forward, sometimes cell r_{4+5} is petiolate. Lower calypter usually broadly rounded-triangular, in some cases small and elliptical. Meral bristles always present; subscutellum strongly developed (except in *Litophasia);* lappets of posterior spiracle usually distinctly unequal in size, the posterior lappet subcircular, in several genera about equal in size.



Eriothrix rufomaculata



Phasia hemiptera

Biology: The larvae are endoparasitoids of other insects, sometimes of other arthropods. Eggs are deposited directly on or in the immediate vicinity of the host. The larvae of tachinids which deposit their eggs directly on the host hatch within minutes (ovolarvipary) and penetrate the host. A conspicuous specialisation is the development of microtype eggs by species of the tribe Goniini in the subfamily Exoristinae. Here, tens of thousands of eggs are deposited on leaves. The eggs only develop after a caterpillar has eaten them (along with the leaves they feed on), after which they hatch inside the caterpillar's digestive tract. Hence, most Goniini show a wide range of lepidopterous hosts. Some other groups show host specialisation: the Dexiini are parasitoids of beetles, the Exoristinae and Tachininae are mainly parasitoids of caterpillars and the larvae of the Phasiinae develop inside true bugs (Hemiptera); others parasitise besides caterpillars also larvae of Tipulidae (Tachininae: *Siphona).* Several species are of economic importance, being useful in biological pest control. The adults of the Tachinidae are largely found on walls, leaves, branches and similar spots; only a small number of species regularly visit flowers. Some species are territorial.

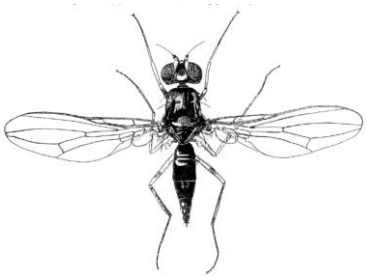
Identification: Andersen (1996), Belshaw (1993), Chandler (1999e), Chandler *et al.* (2001), Clemons (2001), Collins *et al.* (2002), Emden (1954), Falk (1998), Ford (1989), Ismay (1998), Plant & Smith (1997), Tschorsnig & Herting (1994), Wyatt (1986), Wyatt & Sterling (1998)

Tanypezidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Diopsoidea

Number of British species: 1 **Size:** M **Difficulty:** 2 Study group

Characters: The only European species, *Tanypeza longimana*, is a slender, black lustrous, medium sized (5-8 mm) fly with silvery markings on the head and the sides of the thorax, and with long, slender, largely yellow legs. Head rounded; arista pubescent; ocelli present; Ocellar bristles present; Postvertical bristles diverging; 2 pairs of frontal bristles, curving backward; interfrontal bristles absent; vibrissae absent. Wing unmarked, costa with a weak subcostal break; vein Sc reaching the costa, running parallel to vein R_1 and approaching or touching it just before reaching the costa; crossvein BM-Cu present; cell cup closed. Tibiae without dorsal preapical bristle.



Tanypeza longimana

Biology: The larvae of *T. longimana* feed on rotting vegetable matter, possibly in decaying wood or other plant detritus. The adults prefer low

vegetation in moist woodland, in particular near water.

Identification: Chandler (1975), Collin (1945)

Tephritidae

Gallflies

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Tephritoidea

Number of British species: 75 **Size:** S–M **Difficulty:** 1–2 Scheme

Characters: Generally small to medium sized (2.5-10 mm, usually colourful flies, wing often with characteristic markings and vein Sc abruptly bent forward toward the costa at nearly 90°. Arista bare to short pubescent; ocelli present; Ocellar bristles present; Postvertical bristles parallel to diverging; 2-8 pairs of frontal bristles, at least 1 but usually several lower pairs curving inward, at least 1 of the upper pairs curving backward, in some cases frontal bristles inserted on a raised tubercle; interfrontal setulae most often absent or represented by 1-2 tiny setulae near the lunula; vibrissae absent but several genera with strong bristles near the vibrissal angle. Wing with yellow, brown or black markings or dark coloured with lighter markings; in a few species wing clear; costa with a humeral and a subcostal break; apical part of vein Sc usually less distinct or even transparent and at about a right angle with respect to the basal part; crossvein BM-Cu present; cell cup closed, nearly always narrowing to an acute angle, closed by a geniculate vein CuA_2, vein CuA_2 rarely straight or convex. Tibiae without dorsal preapical bristle. Female with oviscape, non retractable basal segment of the ovipositor.



Urophora female



Ceratitis capitata female

Biology: The larvae of nearly all Tephritidae are phytophagous. The female uses her telescopic ovipositor to deposit eggs in living, healthy plant tissue. The larvae develop in flowers, seeds, fruits, leaves, stems or roots of their host plant, depending on the species. Some species induce gall-forming. Several species are serious pests in agriculture and horticulture such as the Mediterranean Fruit Fly *Ceratitis capitata*, others play a role in the biological control of weeds. An exception to the phytophagous lifestyle is *Euphranta toxoneura* (Loew) with larvae developing in galls formed by sawflies (Hymenoptera: Symphyta). Adult Tephritidae are good fliers. They are often found on the host plant or while feeding on nectar, pollen, plant juices, rotting plant material or honeydew.

Identification: Clemons (1996), Clemons (2000), Merz (1994), White (1988), Whittington (2002)

Tethinidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Carnoidea
Number of British species: 10 **Size:** T–S **Difficulty:** 3–4


Tethina grisea, ©BMNH

Characters: Minute to small (1.5-3.5 mm), yellow to black flies with a grey, yellowish, or brownish pruinosity. Arista bare to short pubescent; ocelli present; Ocellar bristles present; Postvertical bristles converging; 1-5 pairs of frontal bristles, the upper ones curving outward or backward, the lower pairs, if present, curving outward, forward and/or inward; interfrontal bristles present or absent; vibrissa-like bristles present, in some cases small and inconspicuous; in the subfamily Tethininae a small lustrous bulge in between the antennae and the anterior vibrissa-like bristle. Wing unmarked, with a pale yellow to brownish tinge; Costa with a subcostal break; vein Sc first running parallel to and then merging with R_1 just before the costa; crossvein BM-Cu absent or very faded; cell cup present but small. Tibiae without dorsal preapical bristle.

Biology: Tethinidae are almost exclusively halophilous flies, mainly found along the coast although they occur in saline inland habitats as well; only a few species are also known from habitats that are apparently without increased salinity (forests, meadows, deserts). They are often present in great numbers. Some species are recorded from secondarily man-created habitats, such as meadows polluted by industrial emissions, slaughterhouses and poultry farms, where they live synanthropically in alkaline damp places.

Identification: Collin (1960b), Collin (1966b), Irwin *et al.* (2001)

Thaumaleidae

Trickle-midges

NEMATOCERA, Culicomorpha, Chironomoidea
Number of British species: 3 **Size:** S **Difficulty:** 2


Thaumelea testacea male

Characters: Small (3-5 mm), delicate, yellow to orange or dark brown, lustrous Nematocera; upper side of thorax often with a U-shaped colour pattern. Eyes holoptic in both sexes; ocelli absent; antenna short and directed forward, with 12 segments, tapering to its tip. Wing clear, with brown tinge and relatively broad. Legs short and slender, tibiae without apical bristles or spurs.

Biology: The larvae and pupae are found in unpolluted aquatic environments, usually in shaded, hilly or mountain areas. The larvae live in the water film of streams and splash zones of springs, banks, rocks and other objects protruding from the water, holding to the substratum with thoracic and abdominal pseudopodia. They feed on vegetable debris and diatoms. The adults are clumsy fliers and are generally found near the larval habitats.

Identification: Disney (1999a)

Therevidae

Stiletto-flies

BRACHYCERA, Asilomorpha, Asiloidea

Number of British species: 14 **Size:** M **Difficulty:** 1–3 Scheme

Characters: Slender to more or less stout small to large (2.5-15 mm) flies, often strongly pubescent with stronger bristles on thorax and legs; colour varying from pale yellow to black. Frons of female in many species with glossy black markings; eyes usually holoptic in the male; antenna variable, first or third segment often the longest; the latter followed by no, or 12 smaller segments and a small apical style. Wing clear or tinged, in some cases with markings or bands; cell m_3 strongly narrowing toward hind margin, or closed; cell cup closed. Legs relatively long and slender; tibiae with apical bristles; empodium bristle-like or absent.



Acrosathe annulata male

Biology: The larvae live in sandy soil, underneath tree bark and in dead wood, where they prey on a range of small invertebrates, in particular beetle larvae. The adults are found in various habitats but prefer open, sunny places in very dry areas they are often found near water. They are able fliers but often sit on the ground or on rocks, leaves, branches tree trunks, etc. Contrary to many other lower Brachycera the adults are not predatory but feed on nectar, plant or animal juices and other organic matter.



Thereva nobilitata female

Identification: Drake (1991), Oldroyd (1969), Stubbs & Drake (2001)

Tipulidae

Long-palped Craneflies

NEMATOCERA, Tipulomorpha, Tipuloidea

Number of British species: 87 **Size:** L **Difficulty:** 1–2 Scheme

Characters: Medium sized to very large (7-35 mm) Nematocera with long and slender antennae, wings, legs and abdomen. Tipulidae include some of the largest Diptera. Rostrum well developed and often with nasus; ocelli absent; antenna usually consisting of 13 segments, in some cases more. Thorax with a V-shaped transverse suture. Wing with 2 anal veins and in some species with conspicuous markings; in a few species female with wings short or reduced.



Nephrotoma female

Biology: The larvae are rarely aquatic, generally semi-aquatic to terrestrial; some species live in mosses, liverworts, or in dying and decaying wood of deciduous trees. The larvae feed mainly on plant remains and detritus but in a number of species living parts of mosses, liverworts and seed plants are eaten as well; the larvae of *Tipula*, subgenus *Tipula* and some *Nephrotoma* species feed on pasture grasses, tree saplings, young cultivated plants, etc., and can cause serious damage to agriculture as they are often present in large numbers. Tipulidae larvae are an important food source especially for birds. The adults occur in a wide range of habitats varying from dark moist forests to dry semi-deserts or high alpine regions. They do not feed; at most, they rarely drink from dew-drops or take some nectar from flowers and similar liquids.

Identification: Coe *et al.* (1950), Stubbs (1972-1974), Stubbs (1992), Stubbs (Unpublished)

Trichoceridae

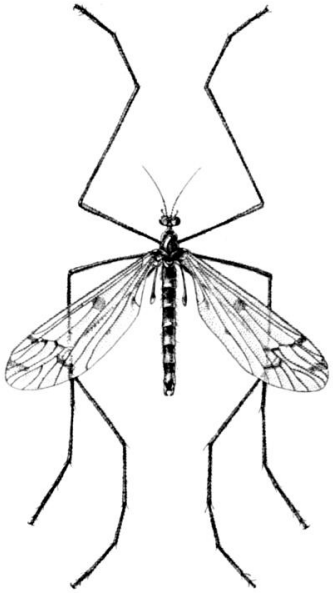
Winter-gnats

NEMATOCERA, Psychodomorpha, Trichoceroidea
Number of British species: 10 **Size:** M **Difficulty:** 2–3 Scheme

Characters: Small to medium sized (3-9 mm), generally light coloured Nematocera, with long slender antennae, wings, legs and abdomen. Ocelli present; antenna with 18 segments. Wing with a short, curved vein A2, the longest in Diazosma. Tibiae with terminal bristles or spurs. Female of Trichocera with a more or less downward curving ovipositor.

Biology: The larvae are terrestrial and saprophagous, living in moist earth, rotting vegetable matter, under bark of fallen coniferous trees, mushrooms and bracket fungi, carrion (including human corpses), excrement, etc. The adults of *Trichocera* are active from autumn to spring, throughout the winter ("winter gnats"), with especially the females found walking on snow. Adults of *Diazosma* occur mainly in summer and early autumn. The males have a characteristic bouncing flight and often form swarms, in particular on sunny days.

Identification: Coe *et al.* (1950), Stubbs (Unpublished)



Trichocera maculipennis male

Trixoscelididae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Sphaeroceroidea
Number of British species: 4 **Size:** S **Difficulty:** 3

Characters: Small (2-4 mm), mostly grey. Arista almost bare to short pubescent; ocelli present; Ocellar bristles present, Postvertical bristles diverging, 2 pairs of frontal bristles and vibrissae present. Wing usually patterned or coloured; costa with a subcostal break; vein Sc complete; crossvein BM-Cu present; cell cup closed. Tibiae with dorsal preapical bristle.

Biology: The species can be found in sandy areas on heaths, also on coastal dunes. It has been recorded by sweeping areas of bare ground on dry grassland that has been very heavily grazed by rabbits. Its biology and the early stages are unknown.

Identification: Colin (1943b), Collin (1951)



Trixoscelis obscurella

Ulidiidae

BRACHYCERA, Muscomorpha Schizophora Acalyptratae, Tephritoidea
Number of British species: 20 **Size:** S–M **Difficulty:** 1–2 Scheme

Characters: Small to large (2.5-11 mm), moderately robust flies, colour varying from partially yellow and dark to all black, in some cases grey or metallic. Arista bare to long pubescent; ocelli present; in a few species all bristles on the head are reduced or absent, but the usual bristle configuration is: Ocellar bristles present, Postvertical bristles parallel to diverging, 1-2 pairs of frontal bristles, scattered interfrontal setulae present, and vibrissal absent. Wing usually with a pattern of spots or stripes or with a spot at the wing tip, rarely all clear; costa with or without a subcostal and/or a humeral break; vein Sc complete; crossvein BM-Cu present; cell cup closed. Tibiae usually without dorsal preapical bristle. Female with oviscape, non retractable basal segment of the ovipositor.


Melieria female

Biology: The biology of most species is little known. Larvae are found in rotting vegetable matter, leaf litter, fruit, dung, sap exuding from tree wounds and underneath tree bark; some species are fully phytophagous, feeding on sugar beet, onions, maize, etc. Adults are found in various habitats ranging from saline biotopes to sandy areas or moist and marshy grounds, on flowers, tree trunks or on excrement.

Identification: Clements (1990), Clements & Merz (1998)

Xylomyidae Wood-soldierflies

BRACHYCERA, Tabanomorpha, Stratiomyoidea
Number of British species: 3 **Size:** M **Difficulty:** 1 Scheme

Characters: Medium sized to large (6-20 mm), slender flies, without bristles on thorax and abdomen. Body dark, with limited to extensive lighter markings. Eyes dichoptic; antenna with acute tip, with 10 segments. Wing clear or tinged; both the cell m_3 and cell cup closed. Tibia of mid and hind leg with apical bristles or spurs; empodium pulvilliform.


Solva marginata

Biology: Larvae, often several together, living underneath the bark of deciduous trees, feeding on injured and dead insect larvae and other small invertebrates. The adults are mainly found near the larval habitats, often sitting on trees.

Identification: Drake (1991), Oldroyd (1969), Stubbs & Drake (2001)

Xylophagidae

Awl-flies

BRACHYCERA, Xylophagomorpha, Xylophagoidea

Number of British species: 3 **Size:** M–L **Difficulty:** 1 Scheme

Characters: Medium sized to large (5-11 mm) flies, largely devoid of bristles, with long, slender wings, legs and abdomen. Body usually dark with yellow markings, in some cases largely yellow. Eyes dichoptic; antenna simple, with 12, rarely 11 segments. Wing without alula and with markings along the veins or across the wing; cell m_3 open; cell cup open or closed. Legs in some cases banded; tibiae with apical bristles or spurs; empodium pulvilliform.

Biology: The larvae live underneath tree bark, in rot holes of trees and in decaying deciduous and coniferous trees where they are thought to prey on other invertebrates, including their own species. Adults are mainly found near the larval habitats, especially in more rich and humid forests, often sitting on tree trunks.

Identification: Drake (1991), Oldroyd (1969), Stubbs & Drake (2001)



Xylophagus ater

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