

A KEY TO THE FAMILIES OF BRITISH DIPTERA

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ABSTRACT

This AIDGAP key should enable anybody to identify adult flies to their family. After approval from academic referees, an earlier draft was subjected to extensive user-testing before the author produced this revised version.

An introduction details the characteristics of Diptera so that they may be recognised from other orders of insects: the key itself leads to the correct family: and a short list of references is appended to guide the investigator's further enquiries.

INTRODUCTION

The vast majority of true flies (order Diptera) can be distinguished from all other adult insects by the following three characters:

1. Flies have only one pair of membranous wings.
2. In place of the hindwings, flies have small, clubbed structures called halteres (shown arrowed in the figures below).
3. Their mouthparts are never adapted for chewing. Flies always suck: their mouthparts may be expanded into sponge-like lobes (as in the house fly) or may be tube-like and adapted for piercing (as in the mosquito).

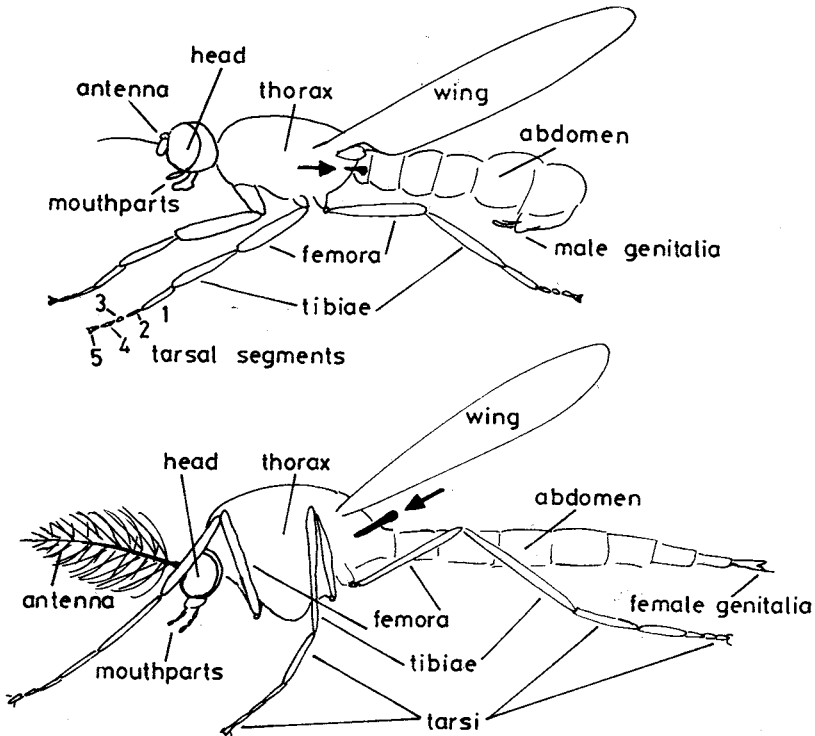


FIG. 1

Many flies can be recognised as such at a glance, but some are rather good mimics of other insects, such as bees, wasps or ants, and can easily be mistaken for them. In cases of doubt, the presence of halteres in place of the hindwings is the best single character. When collecting flies in the field, they can usually be distinguished from the hymenopterans they mimic by their flight pattern. No bee or wasp can fly with the uncanny precision of a hoverfly.

A small number of flies have their wings reduced or even completely absent. Those with shortened or strap-like wings still have halteres and other characteristics of a fly, but there are some highly-specialised parasites of warm-blooded animals and bees which present more of a problem. The Nycteribiidae are small, wingless parasites of bats. They are spider-like in appearance, with very small heads capable of being folded back into a groove in the top of the thorax, and long legs with well-developed claws. The Hippoboscidae are parasites of birds and mammals. These are flattened flies with quite large heads fitting into an excavation in the front of the thorax. They have long legs with large, curved claws. Hippoboscidae may have full wings, reduced wings or be totally wingless. Braulidae are very small, mite-like parasites of bees. There are also aberrant versions of normally winged species which may be found to have the wings poorly developed. A key to the families of flies without complete wings is given by Oldroyd (1970a).

The immature stages of flies are generally more difficult to identify than the adults. The larvae are without true legs, but sometimes have unjointed pseudopods or prolegs. In the sub-order Nematocera, larvae exhibit considerable variation in form, and in some families can be identified to species level. In the sub-order Cyclorrhapha, larvae are maggot-like and show little difference between species. In many cases, the only satisfactory method of identification beyond the family level is to breed them out. A key to the families of Diptera larvae is given by Brindle and Smith (1978).

Aquatic Diptera larvae are included in the guide to freshwater invertebrate animals by Macan (1959).

IDENTIFICATION TO SPECIES

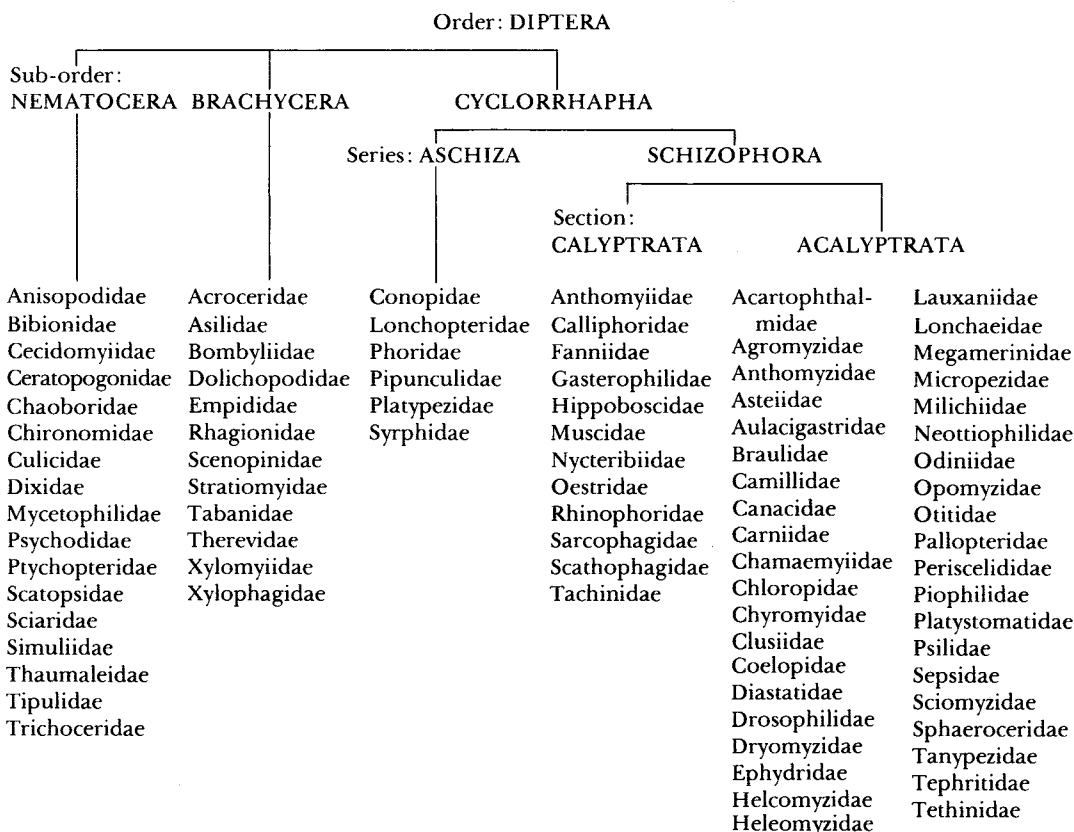
One often hears the correct but unhelpful statement that the only certain way of identifying anything is to compare it with the type specimen (that is, the actual specimen used to define the species). Even if we are able to follow this advice, we still have to exercise judgement as to whether the inevitable slight differences between our specimen and the type are of such magnitude that they cannot be considered to be the same species. In practice, all the entomologists in the world cannot look at the type specimen, and most insects are identified by first using a key to get a name, and then comparing the specimen with a description of the species of that name. In some cases, the author will describe not only the type, but a range of specimens that he considers to belong to the species, so that one knows the range of variation to expect. If the author's work is both recent and of high quality, then the resultant identification will very probably be correct. In many cases, however, the key and description will be old, and although they may be useful as a starting-point, the literature of the group should always be searched for additions, corrections and revisions. There are several ways in which this can be done. There are useful lists of references in Colyer and Hammond (1968). A comprehensive bibliography of key works is published by the Systematics Association (Kerrich, Hawksworth and

Simms, 1978). It is sometimes useful to approach the problem by association with the habitat or host, and this approach is followed in the *Dipterist's Handbook* (Stubbs and Chandler, 1978). A most useful work is the *Check List of British Insects* (Kloet and Hincks, 1975, Part 5: Diptera and Siphonaptera). This is a systematic listing of the species of British Diptera, with much taxonomic information. It is part of the series of *Handbooks for the Identification of British Insects*, details of which can be obtained from: The Registrar, Royal Entomological Society of London, 41 Queen's Gate, London SW7 5HU.

The simplest way of checking whether one's identification is likely to be correct is to show the specimen to someone who is an expert in the family. With some families, where there is no up-to-date published information, it may be the only way of getting a specimen identified with reasonable accuracy. If difficulty is experienced, then help may be available by writing to: The Organiser, Diptera Recording Scheme, c/o Department of Entomology, British Museum (N.H.), Cromwell Road, London SW7 5BD. The author of this key may also be able to put you in touch with someone who can help.

Any note on the identification of insects would be incomplete without a reference to a most useful book on collecting, preserving and studying insects (Oldroyd,

Classification of the Order Diptera
All names in this key follow Kloet & Hincks, 1975



1970b), which is a mine of valuable information on the techniques of collecting, preservation, mounting, curating, examination and photography. It has a section on the principles of zoological classification and nomenclature, and explains entomological jargon.

MAIN KEY TO ALL FLIES WITH COMPLETE WINGS

The general arrangement of flies is shown in Fig. 1 together with the terms used to describe the larger parts. Wing characters will be illustrated as they are needed in the key.

1—Very abnormal flies, parasitic on birds or mammals. Abdomen and thorax greatly flattened, legs long with long, curved claws. Head fitting into an excavation in the front of the thorax (7 genera, 13 species).

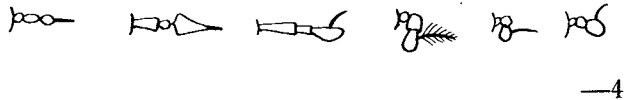
—HIPPOBOSCIDAE

—Normal flies without these special adaptations. —2

2—Antennae with at least 5 segments.

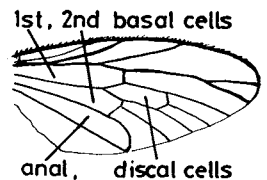


—Antennae with less than 5 segments.



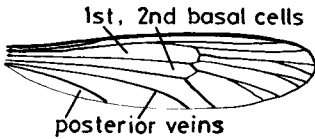
3—Wings with very long anal cell, closed (or nearly closed) close to the wing margin. Antennae never long and thread-like.

Note: a cell is an area of wing membrane enclosed by veins. A closed cell is entirely bordered by veins; an open cell has the margin of the wing as one of its borders. "Cell nearly closed" means that the veins converge towards the wing margin but do not quite meet before reaching it.



—BRACHYCERA/ASCHIZA GROUP (p 525)

—No closed anal cell, the posterior veins diverging towards the margin—or wings with reduced venation.



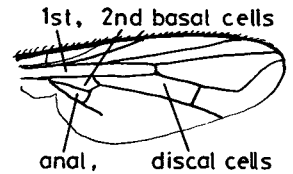
—NEMATOCERA (p. 519)

4—Anal cell long, closed (or nearly closed) not less than $\frac{2}{3}$ of the distance to the wing margin (see 3 above).

(Occasionally, the veins forming the anal cell may not be fully pigmented).

—BRACHYCERA/ASCHIZA GROUP (p. 525)

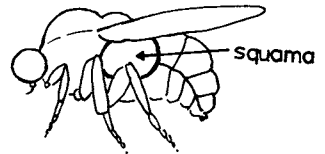
—Anal cell short, extending at most halfway to the wing margin, and sometimes completely absent.



—5

5—Small, bristleless, humpbacked flies with tiny spherical heads and very large squamae (flap-like appendages at the base of the wings). —ACROCERIDAE

Acroceridae: head smaller than squamae; eyes touching in both sexes; mouthparts reduced or absent.
(2 genera, 3 species)

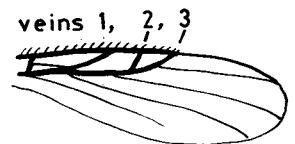


—Head of normal size, much larger than squamae.

—6

6—Venation abnormal, veins 1-3 strong and crowded basally; other veins running from vein 3 to the margin, weak, vein 2 may be absent. —PHORIDAE

Phoridae: minute to small greyish-black, brownish or yellowish flies with a humped-back appearance. Frons (the space above the antennae, between the eyes) wide, usually with strong, up-curved bristles; eyes separated in both sexes (approx 21 genera, 278 species).



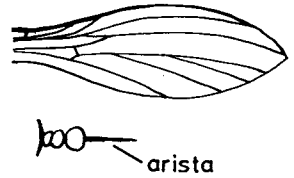
—Venation normal, with veins 1-3 not crowded basally or stronger than others.

—7

7—Wing-tips sharply pointed, with cross-veins at extreme base of wing.

—LONCHOPTERIDAE

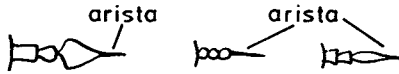
Lonchopteridae: small brownish or yellowish bristly flies; 3rd antennal segment roughly spherical with long terminal arista (1 genus, 7 species).



—Wings not sharply pointed.

—8

8—Antennae with apical arista (sometimes called a style), or arista completely absent.



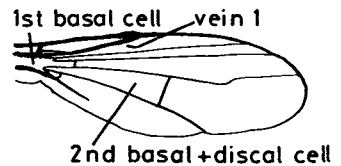
—BRACHYCERA/ASCHIZA GROUP (p 525)

—Antennae with arista dorsal, never truly apical.



—9

9—1st basal cell very short or absent, at most half as long as vein 1. No cross-vein separating 2nd basal and discal cells (compare with wing in 4 above).



—10

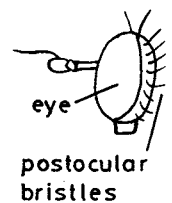
—1st basal cell well over half the length of vein 1.

—SCHIZOPHORA (p 531)

10—Post-ocular bristles strong.

—DOLICHOPODIDAE

Dolichopodidae: small, bristly, often metallic, bluish or greenish flies; head long in profile, higher than wide; proboscis usually short and stout. Vein 4 sometimes kinked and sometimes forked (see Brachycera/Aschiza section couplet 18).



—Postocular bristles minute, hairlike or absent.

—SCHIZOPHORA (p 531)

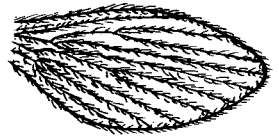
KEY TO SUB-ORDER NEMATOCERA

CHECK CHARACTERS. Antennae often long and thread-like, with more than 5 segments, although these are occasionally indistinctly separated. Never with closed anal cell. Many of the families in this group are lightly-built flies with long legs (crane-flies, midges and gnats).

- 1—Very small midges (wings up to 4.5 mm long but usually much smaller) with 10 or 11 veins reaching the margin and without any cross-veins in the outer part of the wing. Wings, body and legs often covered with long hairs.

—PSYCHODIDAE

Psychodidae: wings broad and often pointed, with cross-veins near the base and two of the veins usually forked about the middle. (Owl midges) (approx 13 genera, 80 species).



- Larger flies, or smaller ones with less than 10 longitudinal veins reaching the wing margin. —2

- 2—Wings with 9 or more longitudinal veins or branches reaching the margin, not counting the humeral cross-vein (a tiny cross-vein joining the leading edge of the wing very close to the wing-base). —3

- Wings with less than 9 longitudinal veins or branches reaching the margin. —11

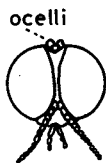
- 3—Exactly 9 veins reach margin, including a very short branch joining front margin $\frac{3}{4}$ of the way to the tip. Delicate, humped-back flies with long, thread-like antennae and a pair of spurs on all tibiae (see 16 below).



—MYCETOPHILIDAE

- Usually more than 9 veins or branches reach the margin; if 9, then tibiae without apical spurs. —4

- 4—Ocelli present.



—5

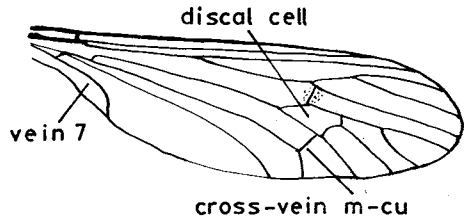
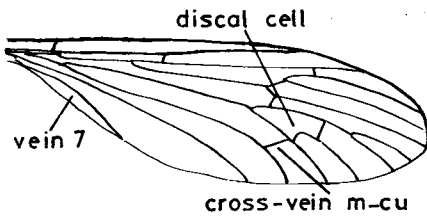
—Ocelli absent.

—6

Note: if there is doubt about the presence of ocelli, go to 6.

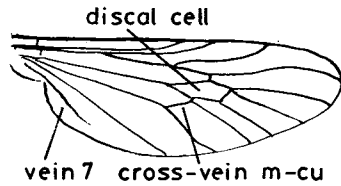
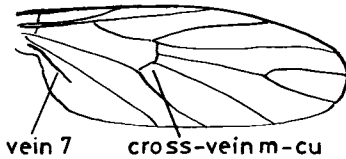
- 5—Thorax with a V-shaped suture (see 7 below); vein 7 short and curved, but reaches margin. —TRICHO CERIDAE

Trichoceridae: cross-vein m-cu level with the outer end of the discal cell (2 genera, 9 species).



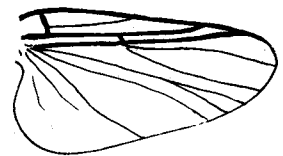
- Top of thorax smoothly domed, without this suture; vein 7 not reaching the margin. —ANISOPODIDAE

Anisopodidae: cross-vein m-cu level with the inner end of discal cell, or discal cell absent (2 genera, 6 species).



- 6—Wings broad, with leading-edge veins strong, the others weak and without cross-veins in the middle. —SIMULIIDAE

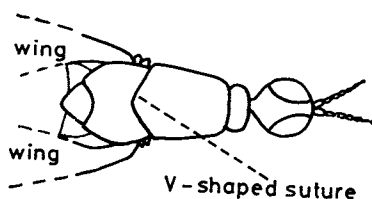
Simuliidae: antennae short, bare, with segments not distinctly separated; mouthparts short and adapted for piercing in the female. Small flies with body short and stout with short, thick legs. (Blackflies) (3 genera, 35 species).



- Wings narrower, with veins roughly equal in strength (mosquitoes and craneflies).

—7

7—Top of thorax with an obvious v- or u-shaped suture, just in front of the wing bases.



—8

—Top of thorax smoothly domed, without this suture.

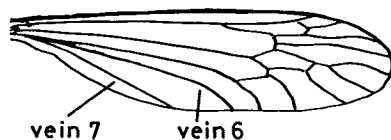
—9

8—Veins 6 and 7 long, both reaching the wing margin.

—TIPULIDAE

Note: if vein 7 is short and curved, check again for ocelli. Trichoceridae (5 above) always have a discal cell, with cross-vein m-cu level with its outer end.

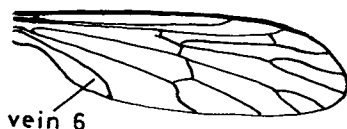
Tipulidae: suture on top of thorax v-shaped; 10-12 longitudinal veins or branches reach the wing margin. Craneflies (Approx 40 genera, 300 species).



—Vein 7 absent.

—PTYCHOPTERIDAE

Ptychopteridae: suture on top of thorax u-shaped; 10 longitudinal veins or branches reach the wing margin (1 genus, 8 species).

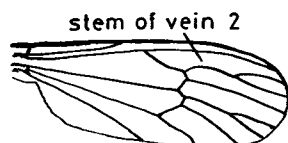


9—Stem of vein 2 long and curved.

—DIXIDAE

Note: if vein 2 unforked, check again for ocelli. Anisopodidae (5 above) have vein 7 present and may have a discal cell.

Dixidae: antennae with 14 segments; male antennae not plumed; no scales on wings and legs. Meniscus midges (2 genera, 14 species).



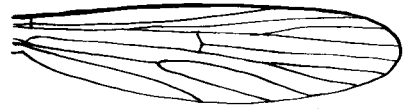
—Stem of vein 2 straight (see 10 below).

—10

10—Mouthparts short; scales almost confined to wing fringe; pale fawn body with white stripe each side of thorax.

—CHAOBORIDAE

Chaoboridae: antennae with 13 segments; male antennae plumed; posterior cross-vein often absent (see below) (2 genera 6 species).



—Mouthparts forming a long, rigid proboscis; scales on wing veins and legs.

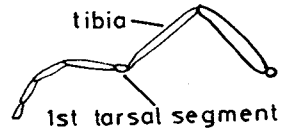
—CULICIDAE

Culicidae: antennae with 13 segments; male antennae plumed; posterior cross-vein present. Mosquitoes (5 genera, 33 species).



11—First tarsal segment very short, usually less than a quarter of the length of the second. —CECIDOMYIIDAE

Cecidomyiidae: usually very small, delicate flies with broad and often hairy wings; 2-6 veins reach the margin. Antennae usually long, with bead-like segments, often adorned with whorls of hair (140 genera, 640 species).



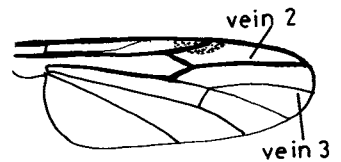
—First tarsal segment well over a quarter the length of the second. —12

12—Antennae inserted below the compound eyes. —13

—Antennae inserted near the middle of the compound eyes, or above. —14

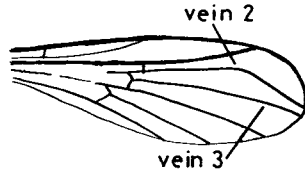
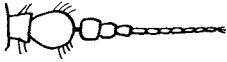
13—Vein 2 thickened, reaching the margin well before the wing-tip. —BIBIONIDAE

Bibionidae: antennae short and thick; wings with leading-edge veins strong, others weaker; basal cells large, the upper one extending to the middle of the wing, the lower one sometimes incomplete. Front tibiae armed with large, strong spurs, or circlets of spines. Usually dark flies of a rather grotesque appearance (2 genera, 18 species).



—Vein 2 not thickened, convergent with vein 3 and reaching the margin at the wing-tip. —**THAUMALEIDAE**

Thaumaleidae: 1st and 2nd antennal segments stout, the remainder more slender; wings without cross-veins or forks in the outer half; front tibiae with spurs weak or absent. Small, bare, brownish or yellowish flies (1 genus, 3 species).

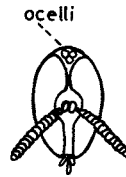


14—Antennae short and compact.



—**SCATOPSIDAE**

Scatopsidae: antennae short, segments not very distinct; leading edge wing veins quite strong, others weak; eyes usually meet above the antennae, gradually separating to accommodate the ocelli. Small to minute, often black, flies (14 genera, 35 species).



—Antennae not of this form, usually much longer and always more delicate. —15

15—Tibiae with apical spurs.



—16

—Tibiae without spurs (or spurs minute).

—17

16—Eyes meeting above the antennae.



—**SCIARIDAE**

Sciaridae: delicate flies, head often overhung by a humped thorax; antennae long, usually thread-like; leading edge wing veins well-marked, others rather faint (17 genera, 85 species).



—Eyes separated above the antennae; ocelli (see 4 above) present.

—MYCETOPHILIDAE

Note: some Chironomidae, which do not have ocelli, may key out here.

Mycetophilidae: delicate flies, head overhung by a humped thorax; antennae long, thread-like. Venation variable, sometimes like *Sciaridae* (16 above). Fungus gnats (66 genera, 289 species).

Note: *Pnyxic Joh.* (*Sciaridae*) will key out here. It has three faint posterior veins, the outer one forked, arising separately from the lower of the strong leading-edge veins.

17—Eyes meeting above the antennae (see 16 above).

—CECIDOMYIIDAE

Cecidomyiidae, sub-family *Lestremiinae*: 1st tarsal segment longer than 2nd but otherwise like the rest of the family (see 11 above).

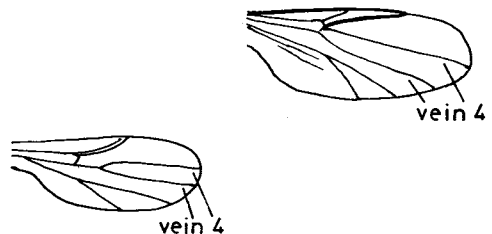
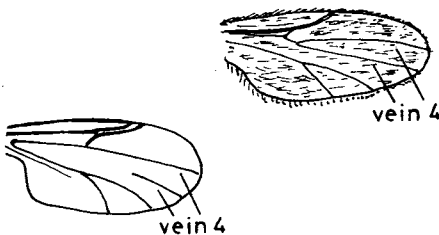
—Eyes not meeting above the antennae.

—18

18—Vein 4 forked.

—CERATOPOGONIDAE

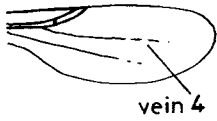
Ceratopogonidae: minute flies, sometimes with broad wings; mouthparts short and adapted for piercing in some species (the biting midges); wings usually held over body at rest. Sometimes with small spines beneath hind femora (absent in *Chironomidae*) (17 genera, 154 species).



—Vein 4 never forked, or wings with reduced venation.

—CHIRONOMIDAE

Chironomidae: the non-biting midges; delicate gnat-like flies, often with head overhung by thorax; mouthparts poorly developed; wings usually narrow, and generally held apart at rest (120 genera, 390 species).



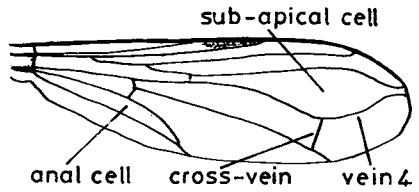
KEY TO BRACHYCERA/ASCHIZA GROUP

CHECK CHARACTERS. Anal cell, if present, usually closed, the veins forming it never diverging towards the wing margin. All flies with a long, pointed anal cell are included in this group. Antennae rather variable, never thread-like, sometimes with the third segment annulated. Ptilinal suture (a suture running up the side of the face and across the frons just above the antennae) absent except in the family Conopidae. The Conopidae are considered by some authorities to be in the Schizophora, Acalyptrata and by others to be in a separate series, Archischiza. This key follows Kloet and Hincks (1975) in placing the Conopidae in the series Aschiza. The Brachycera/Aschiza group includes the hover-flies, horse flies (Clegs) and dance-flies.

- 1—Anal cell long and pointed, extending most of the way to the wing margin (see wing illustrations in, 3 to 13 below). (Occasionally, the cell is not quite closed at the margin (as in 13 below)). —2
- Anal cell short, extending at most $\frac{2}{3}$ of the way to the margin, or anal cell absent. —15
- 2—Sub-apical cell well developed, closed or narrowed to less than one-third of its maximum width at the margin (see 3, 4, 6 below). —3
- No obvious sub-apical cell (see 7 onwards). —7
- 3—Head enormous, consisting almost entirely of compound eyes; mouthparts very small; antennae with 3rd segment often sharply pointed.

—PIPUNCULIDAE

Pipunculidae: small, dark, thinly haired flies with very large heads, eyes usually touching in males and narrowly separated in females. Wings much longer than the abdomen; shape of sub-apical cell distinctive (the outer part of vein 4 and the cross-vein not fully pigmented in g. *Chalarus* Walker and may appear to be absent in some directions of illumination) (8 genera, 75 species).

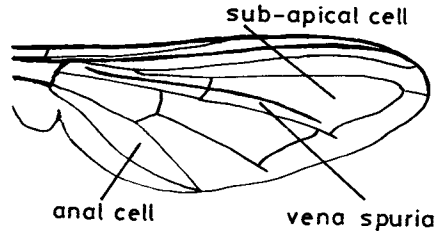


—Head not enormously large.

—4

4—Wings with a “vena spuria” well developed (not a true vein, but a pigmented fold) running across the 1st basal and sub-apical cells. —SYRPHIDAE

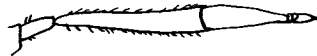
Syrphidae: small to large, often brightly coloured flies; cross-veins closing the sub-apical and discal cells mostly in line forming a “false margin” to the wing. Sub-apical cell always fully closed. Hoverflies. This family include many wasp and bee mimics (68 genera, 239 species).



—“Vena spuria” absent, or at most a weak fold in the sub-apical cell.

—5

5—Antennae very long.



—CONOPIDAE

—Antennae short.

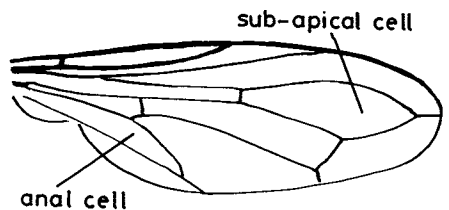
—6

6—3rd antennal segment with short dorsal arista.



—CONOPIDAE

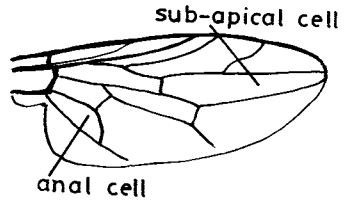
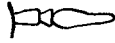
Conopidae: medium to large flies, usually bare or thinly haired, often resembling solitary wasps. Head wide, eyes widely separated in both sexes; proboscis usually long and slender. Abdomen often constricted basally, particularly in males. Sub-apical cell sometimes not closed, but considerably narrowed at the wing margin (7 genera, 24 species).



—3rd antennal segment blunt at tip, without arista.

—SCENOPINIDAE

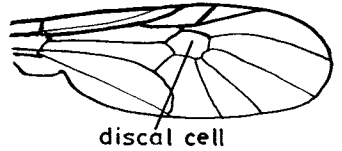
Scenopinidae: small, black, sturdy flies about 5 mm long, without bristles; proboscis very short (1 genus, 3 species).



7—Costa of wing (leading edge vein) discontinued at wing tip, the posterior margin being without a vein.

—STRATIOMYIDAE

Stratiomyidae: discal cell usually small, crowded towards the front margin, with veins leading from it towards the posterior margin faint. Small to fairly large flies, often with metallic colouration; 3rd antennal segment annulated; scutellum (the rear end of the thorax) sometimes with spines. Soldier flies (12 genera, 49 species).

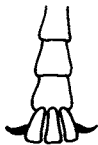


—Wing with costa continued around the posterior margin, usually with cross-veins in the outer $\frac{2}{3}$ of wing.

—8

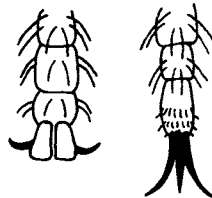
(Note: if the Main Key has been by-passed, Lonchopteridae, which are small, bristly flies with very sharply pointed wings, will come out here. See Main Key, couplet 7).

8—Feet with 3 pads.



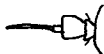
—9

—Feet with 2 pads, or with claws in place of pads.



—12

9—3rd, antennal segment not annulated, but a compound segment with an apical style or dorsal arista.

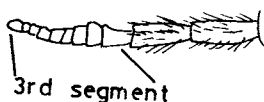


—RHAGIONIDAE

Rhagionidae: vein 2 curved forward, enclosing the stigma. Face (below the antennae) with a very obvious facial knob, strongly convex and often hemispherical. Mostly medium to large, slender, fragile-looking brown and yellow flies, without bristles (but *Ptiolina* Zett. and *Spania* Mg. are tiny black flies). Anal cell sometimes not fully closed at wing margin (7 genera, 17 species).



—3rd antennal segment annulated.

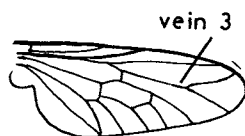


—10

10—Fork in vein 3 broad, the lower branch ending well below the apex of the wing.

—TABANIDAE

Tabanidae: robust flies without bristles; head large, mouthparts stout, adapted for piercing in the female; eyes touching in the male. Squamae (flap-like appendages at the base of the wing—see Main Key couplet 5) large. Horse-flies (including clegs) (4 genera, 25 species).



—Fork in vein 3 narrow, the lower branch ending at about the apex of the wing.

—11

11—4th posterior cell open.

XYLOPHAGIDAE

Xylophagidae: antennae with strongly developed first segment. Thorax and abdomen long (1 genus, 3 species).



4th posterior cell

—4th posterior cell closed.

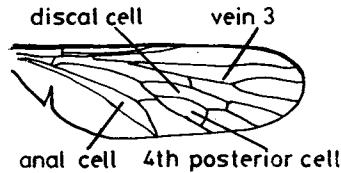
XYLOMYIIDAE

Xylomyiidae: antennae with 1st segment small and somewhat triangular in profile. Thorax and abdomen yellow and black, legs yellowish (1 genus, 3 species).



4th posterior cell

12—4th posterior cell closed.



—14

—4th posterior cell open.

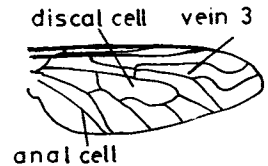
—13

13—4 veins reach the wing margin between the anal cell and the lower fork of vein 3 (see 10 above). —14

—3 veins reach the wing margin between the anal cell and the lower fork of vein 3.

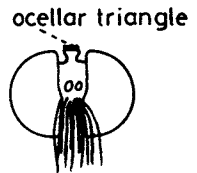
—BOMBYLIIDAE

Bombyliidae: small to fairly large, furry, bee-like flies with long, thin legs; wings sometimes patterned, held open at rest; proboscis sometimes very long, sometimes short with prominent labellum (see 14 below) (5 genera, 11 species).



14—Top of head sunk between the eyes leaving the ocellar triangle prominent; face below the antennae strongly produced and bearing a “moustache” of hairs and bristles. —ASILIDAE

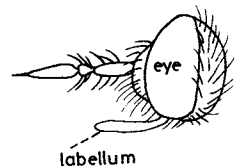
Asilidae: eyes separated in both sexes; mouthparts strong and horny, adapted to piercing in both sexes. Medium to large flies, usually of narrow build, with strong bristly legs. Robber-flies (15 genera, 27 species).



—Top of head not sunk between the eyes; face below the antennae deeply excavated.

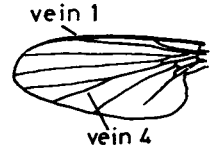
—THEREVIDAE

Therevidae: proboscis short with prominent labellum, upcurved, receding into the facial hollow; males with eyes touching; females usually with a pair of shining black patches on the frons (above the antennae). Medium sized, elongated, bristly flies with slender legs (3 genera, 13 species).



15—Basal cells minute, with no cross-veins in the outer $\frac{4}{5}$ of the wing; vein 4 forked. —PLATYPEZIDAE

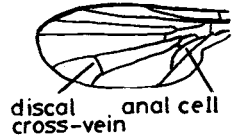
Platypezidae: g. *Microsania* Zett. and *Opetia* Mg. only. *Microsania* has a costa (leading-edge vein) thickened and bearing spines up to the end of vein 1. *Opetia*, which does not have a thickened, spinose costa, is considered by some authorities to belong to a separate family, *Opetiidae*.



- Basal cells longer, or at least one cross-vein in the outer $\frac{1}{3}$ of the wing. —16
 (Note: if the Main key was by-passed, Phoridae (humped-back flies with unusual venation) and Acroceridae (small hump-backed flies with tiny heads) will come out here).

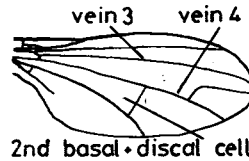
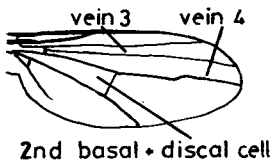
- 16—Anal cell pointed, and almost twice as long as the second basal cell (the one immediately above it). —PLATYPEZIDAE

Platypezidae: small, thinly haired flies, usually having the basal 3 or 4 segments of the hind tarsi dilated. Discal cross-vein present or absent; vein 4 sometimes forked (12 genera, 31 species).



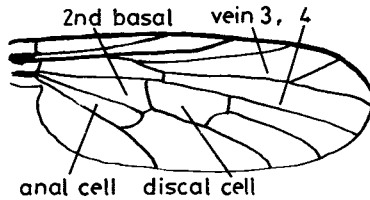
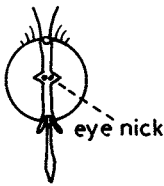
- Anal cell less than twice as long as the 2nd basal cell, or anal cell absent. —17
- 17—Flies without any bristles; discal cell small (see 7 above). —STRATIOMYIDAE
- Flies with bristles. —18
- 18—Shining metallic bluish, greenish or bronze flies. —DOLICHOPODIDAE

Dolichopodidae: basal cells very small, 2nd basal and discal cells not separated by a cross-vein (compare with *Empididae*); small bristly, often metallic bluish or greenish flies, usually with heads long in profile. Vein 4 sometimes kinked, sometimes forked; proboscis usually short and stout; male genitalia often very prominent (37 genera, 265 species).



- Flies not shining and metallic. —19
- 19—2nd basal and discal cells separated by a cross-vein. —EMPIDIDAE

Empididae: small to medium-sized, mostly bristly flies; head mostly nearly spherical, proboscis usually rigid, sometimes very long. Usually an incision or nick is present in the inner margin of the eyes, near the bases of the antennae (35 genera, 205 species).
Dance-flies.



—2nd basal and discal cells not separated by a cross-vein or discal cell absent.

—20

20—1st and 2nd basal cells (and anal cell if present) long, as in 19 above.

—EMPIDIDAE

—1st basal and anal cells very short, as in 18 above; one cross-vein only in the middle third of the wing.

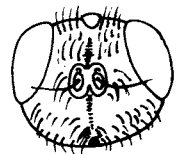
—DOLICHOPODIDAE

KEY TO THE SCHIZOPHORA

(Excluding Braulidae, Nycteribiidae and Hippoboscidae—see Introduction and Main Key.)

CHECK CHARACTERS. Ptilinal suture (see 4 below) present. Anal cell usually short, extending at most halfway to the wing margin, but sometimes absent. This group includes house-flies, bluebottles and fruit-flies.

1—Mouthparts reduced, proboscis very small or absent. Mostly large, furry or hairy flies.



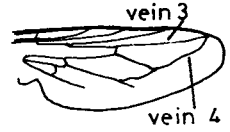
—2

—Mouthparts well developed, proboscis distinct and obvious.

—3

- 2—Vein 4 bent, converging on vein 3 apically and sometimes joining it just before the wing margin.
—OESTRIDAE

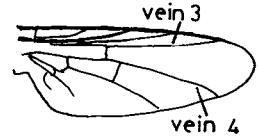
Oestridae: bot flies, larvae internal parasites of mammals. Mostly large, hairy, bee-like flies, but *Oestrus* L. is characterised by the frons and the top of the thorax bearing small wart-like bumps (4 genera, 7 species).



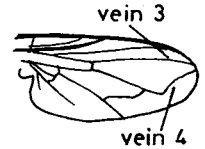
- Vein 4 straight.

- GASTEROPHILIDAE

Gasterophilidae: bot flies, larvae parasitic in mammals. Ovipositor strongly developed in female. Large, furry, bee-like flies (1 genus, 4 species).

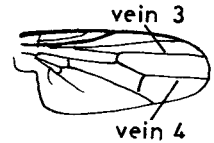


- 3—Vein 4 bent upwards sharply, reaching the margin close to vein 3 or joining vein 3 before reaching the margin.



- CALYPTERATES (p 533)

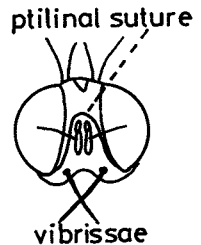
- Vein 4 not sharply bent, usually straight but occasionally gently curved.



—4

- 4—Vibrissae present.

(In this key, vibrissae are defined as black bristles, clearly longer and stronger than other bristles around the mouth.)



—5

- Vibrissae absent.

- ACALYPTERATES (p 537)

5—Antennae with 3rd segment round in profile.



—ACALYPTERATES (p 537)

—Antennae with 3rd segment considerably longer than wide (doubtful cases are keyed out both ways).



—6

6—Hind tibia with strong bristles in the basal $\frac{4}{5}$ (bristles at least as long as the diameter of the tibia). —CALYPTERATES (p 533)

—Hind tibia without strong bristles, except sometimes in the apical $\frac{1}{5}$. —7

7—Medium to large flies with fine, whitish hairs on the lower part of the back of the head (Scathophagidae). —CALYPTERATES (p 533)

—Lower part of the back of the head without fine, white hairs; mostly very small flies. —ACALYPTERATES (p 537)

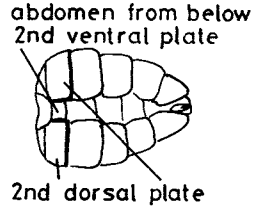
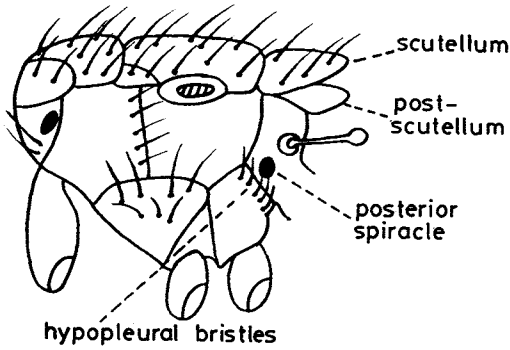
KEY TO THE CALYPTERATES

1—Hypopleural bristles present (see below). —2

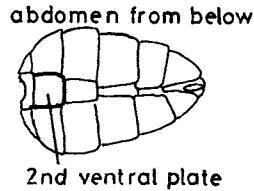
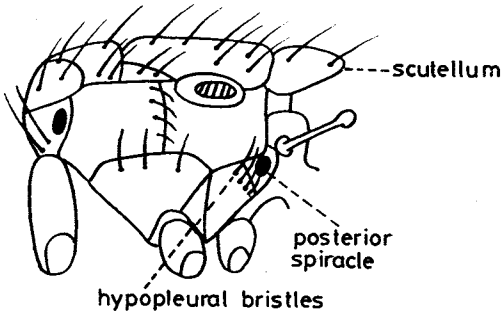
—Hypopleural bristles absent. —6

2—Postscutellum strongly developed (see below). —TACHINIDAE

Tachinidae: abdomen with the 2nd dorsal plate (the first easily visible from above) extended round the underside, almost meeting in the middle and usually covering the edges of the 2nd ventral plate. In a few species, the 2nd dorsal plate is shorter and does not cover the edges of the 2nd ventral plate but is connected to it by a visible membrane. Vein 4 bent, usually abruptly, towards vein 3 at apex (see Key to the Schizophora, couplet 3). Sometimes called "Parasite flies" (larvae are internal parasites of living arthropods) (35 genera, 236 species).



—Postscutellum weakly developed or absent; abdomen with the 2nd dorsal plate extended round the underside where its edges are usually covered by the 2nd ventral plate.



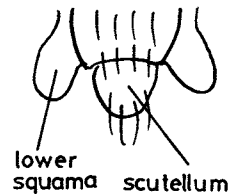
—3

3—Lower squama with the inner hind margin diverging from the side of the scutellum.

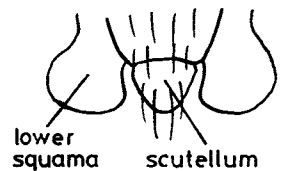
—RHINOPHORIDAE

Rhinophoridae: small, slender black flies, never metallic; bend of vein 4 never sharp (8 genera, 10 species).

Note: *Protocalliphora Hough* (Calliphoridae), which has a sharp bend in vein 4 and a metallic greenish-black abdomen, will key out here.



—Lower squama with the inner hind margin following the side of the scutellum.



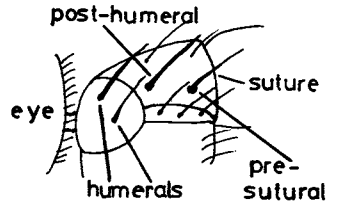
—4

4—Thorax with long wavy golden (occasionally dark brown) hair, in addition to the black bristles (see 5 below). —CALLIPHORIDAE

—Thorax only with short, stiff hairs and black bristles. —5

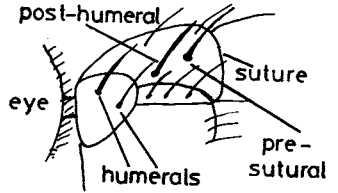
5—Post-humeral bristle situated higher than or level with the pre-sutural bristle. —SARCOPHAGIDAE

Sarcophagidae: mostly grey flies with a chequered or tessellated appearance. Flesh-flies (16 genera, 61 species).

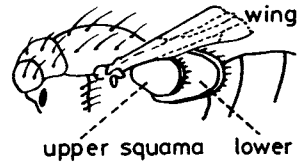


—Post-humeral bristle situated lower on the thorax than the pre-sutural bristle. —CALLIPHORIDAE

Calliphoridae: often metallic green or blue flies (greenbottles and bluebottles). Also includes the *Calliphoridae* keyed out in 4 above (10 genera, 35 species).



6—Lower squama large, as long as or longer than the upper.

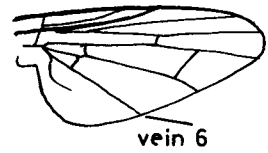
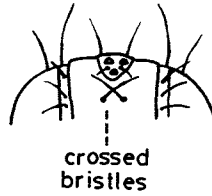
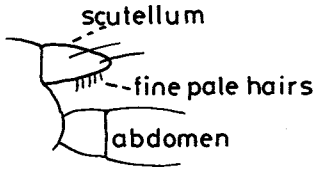


—7

—Lower squama short, at most half the length of the upper. —9

7—Vein 6 reaches the margin. —ANTHOMYIIDAE

Anthomyiidae: frons (forehead) often with a pair of crossed bristles, and fine pale hairs pointing downwards from the underside of the scutellum. (The crossed bristles can be small in males with a very narrow frons) (34 genera, 218 species).



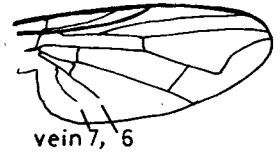
—Vein 6 not reaching margin.

—8

8—Veins 6 and 7 short, their paths not convergent.

—MUSCIDAE

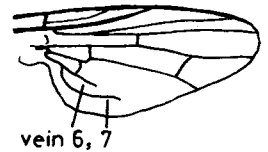
Muscidae: never with crossed bristles and fine pale hairs under the scutellum (see Anthomyiidae above). This family includes the common house-fly (45 genera, 178 species).



—Vein 7 longer and usually fainter than vein 6, their paths convergent.

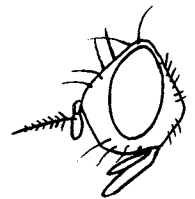
—FANNIIDAE

Fanniidae: never with crossed bristles and fine pale hairs under the scutellum (see Anthomyiidae above). This family includes the lesser house-fly (2 genera, 59 species).



Note: *Azelia R-D* (Muscidae), which has vein 6 short, with an abrupt end, and vein 7 longer but parallel to vein 6 apically, may key out here.

9—Back of head flattened above, without fine, pale hairs below.
(Note: several common Fanniidae and Muscidae, which have vein 7 longer than vein 6 and their paths convergent may key out here. Where in doubt return to couplet 7 above).



(See couplet 7 above).

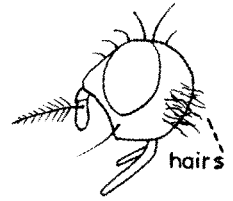
—ANTHOMYIIDAE

—Back of head rounded, with fine, pale hairs below.

—SCATHOPHAGIDAE

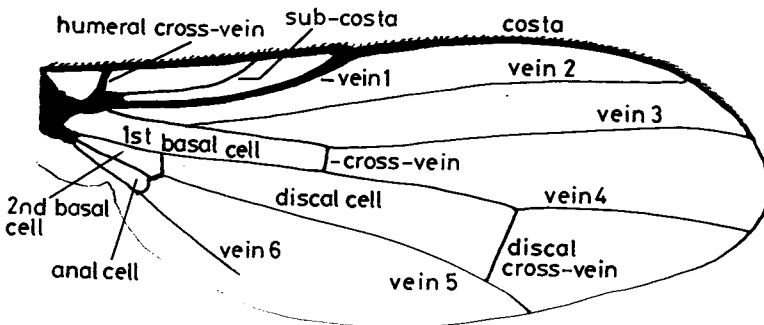
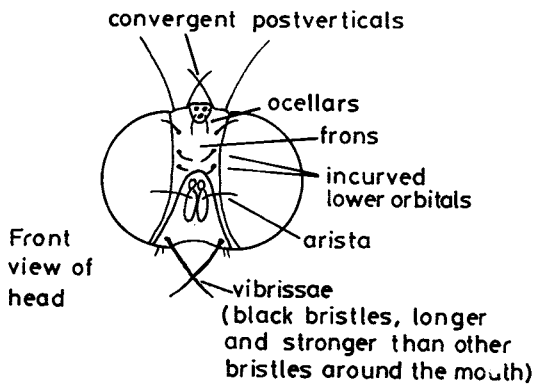
Scathophagidae: medium to large, predatory flies. Lower squama reduced to a narrow strip. Eyes well separated in both sexes. This family includes the common dung-fly (22 genera, 54 species).

Note: the hairs behind the head are weak in *Leptopa* Zett., which is a small, yellow fly with large, downward-pointing vibrissae, and a group of large, downward-pointing bristles at the back of the jowls, just below the eye.



KEY TO THE ACALYPTERATES
(Excluding Braulidae—see Introduction)

This is a large group (40 families) of often rather similar flies, some of which are very small. In this key, frequent use is made of wing venation and head bristles, and some of these characters are illustrated below. The wing figure shows an Acalypterate wing with all its veins and cells present. A complete cell is one that is completely bounded by wing-veins. If one of these (including a cross-vein) is missing, we say that the cell is “incomplete”, “not separated from the next cell” or “absent”, depending on the circumstances.



1—Very small flies (3 mm long) with brown and yellow banded legs.

—PERISCOLIDIDAE and ODINIIDAE

Periscolididae: 2nd segment of antenna projecting like a hood over the 3rd. Greyish flies without vibrissae, but with several bristles around the mouth (1 genus, 4 species).



Oдиниidae: antennae normal; vibrissae strong; short, fat legs; wings with small, dark patches at the end of vein 1 and on the cross-vein closing the 1st basal cell (1 genus, 6 species).



Note: neither of the families above have dorsal preapical bristles on the tibiae (see 4 below). A few unusual *Drosophilidae* (14 below), which have these bristles, may key out here.

—Legs without brown and yellow bands. —2

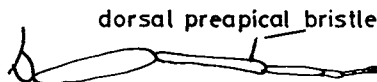
2—Venation complete; all cells (1st basal, 2nd basal, anal and discal) present (see above). —3

—Venation incomplete; one or more cells absent or incomplete. —9

3—Vein 6 extending at least a quarter of the distance from the anal cell to the wing margin. —22

—Vein 6 short or absent, extending to less than a quarter of the distance from the anal cell to the wing margin. —4

4—Hind tibia with dorsal preapical bristle (longer than the diameter of the tibia at the point of insertion).



—Hind tibia without a dorsal preapical bristle. —7

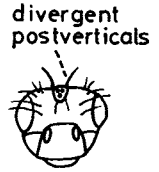
5—Post-vertical bristles convergent (see below).

—6

—Post-vertical bristles divergent.

—CANACIDAE

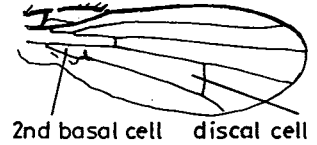
Canacidae: very small, greyish or greyish-brown seashore flies; bases of antennae widely separated; arista short; eyes small and lengthened horizontally; mouth opening wide (2 genera, 2 species).



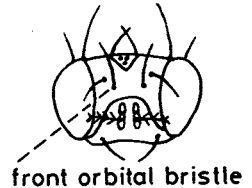
6—Vibrissae present.

—DIASTATIDAE

Diastatidae: very small greyish or brownish-grey flies; costa of wing broken near the end of vein 1, and sometimes also near the humeral cross-vein. Front orbital bristles inset and upswept. Sub-costa incomplete, merging with vein 1 (2 genera, 8 species).



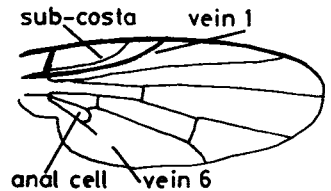
Note: unusual *Drosophilidae* (14 below) that have the 2nd basal and discal cells separate will key out here. They do not have the orbital bristles arranged as above.



—Vibrissae absent.

—LAUXANIIDAE

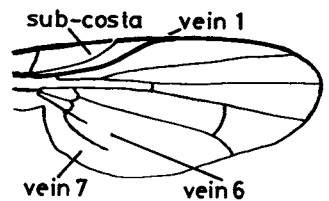
Lauxaniidae: usually two pairs of orbital bristles; sub-costa complete, running to the wing margin and well separated from vein 1. Small flies with colour ranging from light yellow through reddish-brown to bluish- or greenish-black; sometimes with marked wings. Anal cell convex apically; vein 6 short and often with an abrupt end. Costa of wing unbroken (11 genera, 46 species).



7—Sub-costa complete, ending in the costa, separated from vein 1.

—CHAMAEMYIIDAE

Chamaemyiidae: generally very small, greyish or yellowish-grey, heavily dusted flies; vein 6 very weak, vein 7 more developed, running about halfway to the wing margin. Postvertical bristles convergent or absent (4 genera, 25 species).

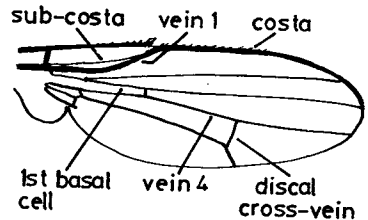


Note: if the postverticals are strong and divergent, it is probably *Canacidae* (5 above) with poorly developed preapical bristles on the tibiae.

—Sub-costa fades or merges with vein 1 before reaching the costa. —8

8—Cross-vein closing the 1st basal cell short (about $\frac{1}{2}$ the length of the part of vein 4 joining the two cross-veins). —TETHINIDAE

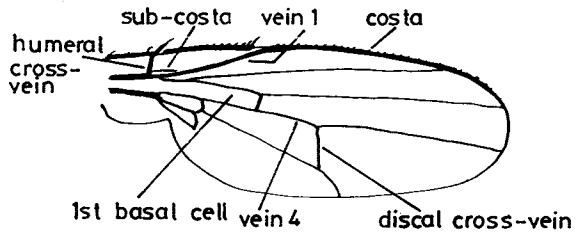
Tethinidae: small to very small greyish or brownish flies of the seashore; mouth opening wide; costa broken near the end of vein 1 (2 genera, 10 species).



—Cross-vein closing the 1st basal cell longer (about $\frac{2}{3}$ the length of the part of vein 4 joining the two cross-veins). —MILICHIIDAE

Note: Opomyzidae (51 below) will key out here if vein 6 is poorly developed. They are yellowish, brownish or almost black flies with clouded or spotted wings.

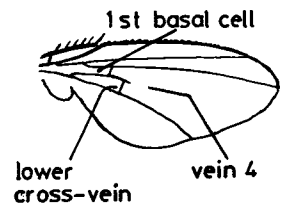
Milichiidae: small to very small, greyish-black or shining black flies; costa broken twice, once near the humeral cross-vein and a stronger break near the end of vein 1 (5 genera, 10 species).



Note: Canacididae (5 above) may key out here if the preapical bristle on the tibiae is poorly developed. Their eyes are small and lengthened horizontally.

9—Vein 4 stops immediately after the end of the 1st basal cell. —CARNIIDAE

Carniidae: 1 or 2 closed cells, the lower cross-vein sometimes absent; costa broken near the end of vein 1. Very small flies (about $1\frac{1}{2}$ mm long) (2 genera, 13 species).



Note: Agromyzidae (33 below), which sometimes have vein 4 unpigmented apically, are somewhat larger and lack the small bristles on the basal part of the costa of the wing.

—Vein 4 extends at least to the middle of the wing. —10

10—Anal cell present.

—11

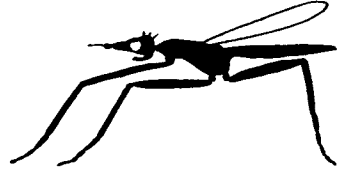
—Anal cell absent.

—15

11—Long thin flies with long thin legs.

—MICROPEZIDAE

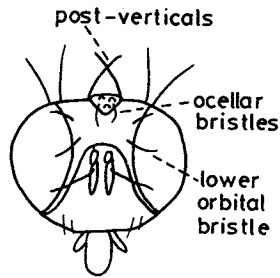
Micropezidae: extraordinary, long, thin flies; face receding (weak chin) with a generally streamlined appearance; wings narrow, no cross-vein separating second basal and discal cells; veins 3 and 4 convergent apically (3 genera, 9 species).



—More compact flies, not exceptionally long and thin.

—12

12—Ocellar bristles present.



—13

—Ocellar bristles absent.

—AULACIGASTRIDAE

Aulacigastridae: small flies with large mouths; mouthedge with a thick rim bearing a number of quite strong bristles; wing venation rather variable with 2nd basal cell and discal cell often not separated by a cross-vein, anal cell present or absent and discal cross-vein sometimes absent. 1st basal cell extends to about $\frac{1}{3}$ of the wing length (2 genera, 2 species).



13—Lower orbital bristles (see 12 above) incurved towards the centre of the frons (forehead); discal cross-vein absent (see 33 below).

—AGROMYZIDAE

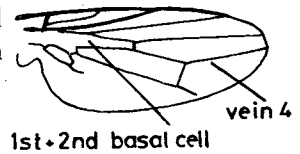
—Lower orbital bristles curved forward or absent.

—14

(Note: if the lowest orbital bristle is inset and up-swept, try Diastatidae (see 6 above) which will key out here if the anal cell is unusually well developed).

14—The basal part of vein 4, which separates the 1st basal cell from the 2nd basal cell, absent. Head rounded in profile.

g. *Saltella* R-D (see 25 below).



—SEPSIDAE

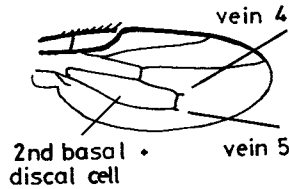
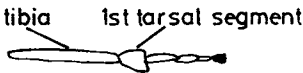
—Vein 4 complete, but the cross-vein separating the second basal and discal cells usually absent. —DROSOPHILIDAE

Drosophilidae: small or very small flies, often attracted to fermenting substances; 2 or 3 pairs of orbital bristles, the front ones usually curved forwards; costa of wing broken twice, near the humeral cross-vein and near the end of vein 1; arista often plumose, with an obvious Y-fork at the tip (10 genera, 52 species).



15—1st tarsal segment of hind legs much longer than the 2nd and not dilated. —16

—1st tarsal segment of hind legs less than $1\frac{1}{2}$ times as long as the 2nd, and usually dilated. Cross-vein separating the 2nd basal and discal cells missing. Veins 4 and 5 often fade apically.

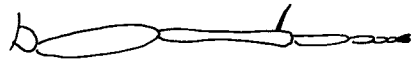


(see 30 below).

—SPHAEROCERIDAE

16—Dorsal preapical bristle present on hind tibia.

(see 6 above).



—DIASTATIDAE

—Hind tibia without dorsal preapical bristle. —17

17—Mouthedge with a thick rim bearing strong bristles (see 12 above).

—AULACIGASTRIDAE

—Mouthedge normal, without a thickened rim. —18

18—Discal cross-vein absent (see 19 below).

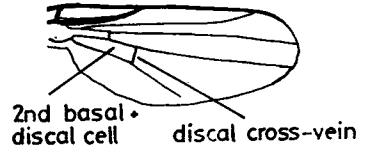
—ASTEIIDAE

—Discal cross-vein present.

—19

19—Discal cross-vein well before the middle of the wing (see below). —ASTEIIDAE

Asteiidae: very small flies with rather variable venation; 2nd basal cell not separated from discal cell, or discal cell absent, leaving only 1 cross-vein in the wing (2 genera, 6 species).



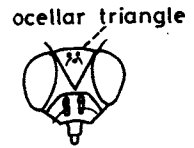
—Discal cross-vein at or beyond middle of wing.

—20

20—Small, smooth flies with few bristles, pleurae (sides of thorax) bare.

—CHLOROPIDAE

Chloropidae: small or very small, almost bristleless flies with a characteristic large ocellar triangle. Often black, yellow and black or green and black; 2nd basal cell not separated from discal cell. No break in the costa of the wing near the humeral cross-vein (39 genera, 147 species).



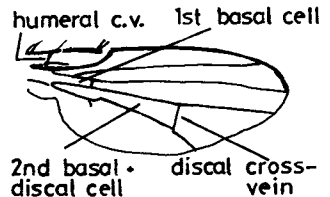
—Quite bristly flies, pleurae always bearing bristles.

—21

21—Post-vertical bristles strong and crossed (see 12 above).

—CAMILLIDAE

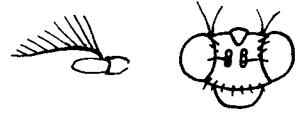
Camillidae: small shining brownish-black flies; 2nd basal cell not separated from discal cell; costa broken twice, near the humeral cross-vein and near the end of vein 1; antenna with arista plumose on the upper side (like some *Ephydriidae*), but also with short hairs below (1 genus, 5 species).



—Post-vertical bristles absent.

—EPHYDRIDAE

Ephydridae: mouth opening very large in some species, normal in others; costa of wing broken very distinctly near the humeral cross-vein and again near the end of vein 1; wings sometimes patterned; 2nd basal cell not separated from discal cell. Arista bare, or plumose with hairs on the upper side only (Approx 38 genera, 130 species).



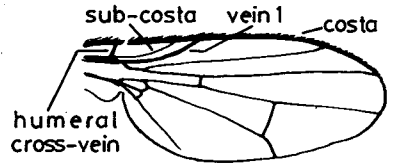
22—Very small flies (2 mm long). —23

—Larger flies. —24

23—Sub-costa complete, pigmented, running to the costa well separated from vein 1.

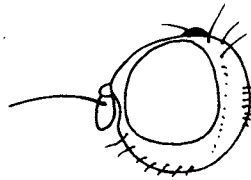
—ACARTOPHTHALMIDAE

Acartophthalmidae: very small, dark flies; costa of wing broken near the humeral cross-vein; head bristles long, post-verticals strong and divergent (1 genus, 2 species).



—Sub-costa fades apically or merges with vein 1 before reaching the wing margin. —24

24—Head almost circular in profile.



—25

—Head not circular in profile. —26

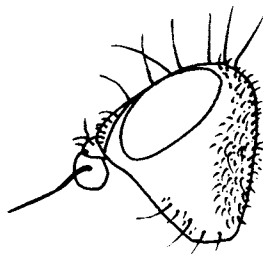
25—Small black or brownish-black flies. —SEPSIDAE

Sepsidae: the posterior spiracle (the respiratory opening just below and to the front of the haltere) always with a bristle across it (sometimes more than one). Small black or brownish-black flies, sometimes metallic and shining; some species with the abdomen constricted basally, giving an ant-like appearance, and the wing with a dark apical spot; others without the wing marking (6 genera, 25 species).

—Not small black or brownish-black flies.

—26

26—Eyes very small, oval, with the space below the eye equal to about twice the height of the eye. Posterior spiracle with a group of bristles across it. g. *Orygma* Mg (see 25 above).



—SEPSIDAE

—Head not as illustrated above.

—27

27—Face, below the antennae deeply excavated and produced at the mouthedge (like those illustrated in 28 below).

—28

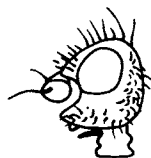
—Face not hollowed out in this way.

—29

28—Back of head flattened.

—COELOPIDAE

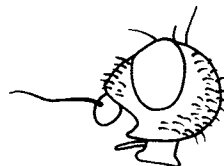
Coelopidae: small to medium-sized rather flattened flies of the seashore; very bristly or hairy; feet large; sub-costa complete, reaching the costa (2 genera, 3 species).



—Back of head rounded.

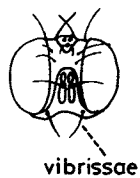
—DRYOMYZIDAE

Dryomyzidae: yellowish or reddish-brown flies associated with putrifying matter or rotting fungi; sub-costa complete, well separated from vein 1; wings very large (1 genus, 2 species).



29—Vibrissae present.

(Black bristles longer and stronger than others around the mouth.)



vibrissae

—30

—Vibrissae absent.

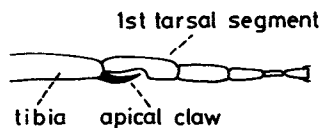
—37

30—1st tarsal segment of hind legs much longer than second and not dilated. —31

—1st tarsal segment of hind legs at most $1\frac{1}{2}$ times as long as the second and usually dilated.

—SPHAEROCERIDAE

Sphaeroceridae: minute to small, usually black or brown flies, often associated with dung: mouth opening wide; front femora often enlarged; hind tibia sometimes with large apical claw, sometimes as illustrated in 15 above. In some species, the apical sections of veins 4 and 5 fade apically and the 2nd basal and discal cells are not separated by a cross-vein; others have complete venation (approx 3 genera, 106 species).



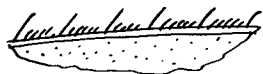
31—No dorsal preapical bristle on hind tibia. —32

—Hind tibia with dorsal preapical bristle. Post-vertical bristles convergent (If divergent or absent, try Clusiidae, 35 below).



—HELEOMYZIDAE

Heleomyzidae: small to medium-sized yellowish, brownish or grey flies, associated with decaying animal or vegetable matter (particularly carrion); costa of wing with a series of spines, distinct from the normal costal cilia (indistinct in the very small, rare fly *Borboropsis* Czerny) (17 genera, 61 species).

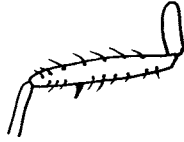


32—Sub-costa (see 23 above) well separated from vein 1 and fully developed throughout, joining the costa at a point separated from vein 1. —34

—Sub-costa fades apically or merges with vein 1.

—33

- 33—Front femora with a short, stout spine beneath, clearly differentiated from other bristles.



—ANTHOMYZIDAE

Anthomyzidae: small or very small, slender-bodied flies with long, narrow wings; post-vertical bristles very small or absent; two up-swept orbital bristles, with sometimes a small, third lower orbital, which is never incurved; no mesopleural bristles but two sternopleurals (see 51 below) (4 genera, 15 species).

- Front femora without this spine.

—AGROMYZIDAE

Agromyzidae: lower orbital bristles incurved (see 12 above); post-vertical bristles divergent; 3rd antennal segment rounded or produced to a sharp point; discal cross-vein present or absent. Small or very small flies whose larvae mine the leaves and stems of plants (18 genera, 312 species).

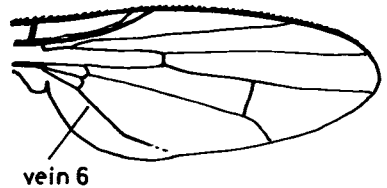
Note: two other families will key out here in some circumstances. *Opomyzidae* (51 below), which may have mouth bristles that could be interpreted as vibrissae, are yellowish, brownish or nearly black flies with clouded or spotted wings.

Odiniidae (1 above), which have the front orbital bristles incurved, are greyish flies, with brown patches on the abdomen and conspicuously short and fat hind legs, usually yellow with brown bands.

- 34—No strong bristles on sides of the thorax.

—PIOPHILIDAE

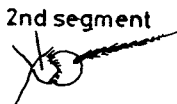
Piophilidae: small, shining black flies, often with bluish reflections; vein 6 bent or curved forwards at a point about halfway to the wing margin and fading apically; costa of wing broken at the end of the subcosta; 3rd antennal segment short and rounded, with an almost bare arista (1 genus, 10 species).



- Sides of thorax with strong bristles.

—35

- 35—2nd segment of antennae with a triangular projection over the 3rd segment, when viewed from the outside.



—CLUSIIDAE

Clusiidae: small flies often associated with rotting wood; 2 to 4 orbital bristles, sometimes with a pair of small, crossed bristles in between; costa of wing broken near the end of the sub-costa; post-vertical bristles divergent or absent; vein 6 extending about half-way to the wing margin (4 genera, 10 species).

—Antennae normal.



—36

36—Eyes very oval, twice as high as wide.

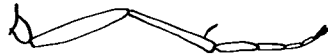
—CLUSIIDAE
(See 35 above)

—Eyes approximately circular.

—NEOTTIOPHILIDAE

Neottiophilidae: 2 genera, 2 species. *Neottiophilum praeustum* (Mg.) is a shining reddish-yellow fly with a spinose costa (see 38 below); about 9 mm long. *Actenoptera hillarella* Zett. is much smaller (4.5 mm long) and does not have a spinose costa. Both have divergent post-vertical bristles.

37—Tibiae with dorsal pre-apical bristles.

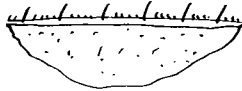


—38

—Tibiae without dorsal pre-apical bristles.

—41

38—Costa of wing with a series of spines, distinct from the costal cilia.



—HELCOMYZIDAE

Helcomyzidae: medium sized (5-10 mm) flies associated with rotting seaweed; post-vertical bristles parallel or divergent; costa unbroken; sub-costa complete (2 genera, 2 species).

—Costa of wing without such spines.

—39

39—Post-vertical bristles convergent (see 12 above).

—LAUXANIIDAE
(See 6 above)

—Post-vertical bristles parallel or divergent.

—40

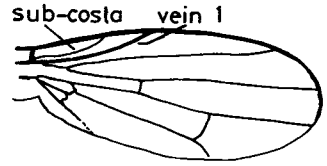
40—Shining black, rather hairy flies.

—LONCHAEIDAE
(see 50 below)

—Not shining black.

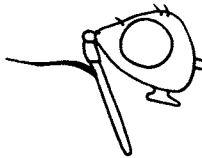
—SCIOMYZIDAE

Sciomyzidae: small to medium-sized flies associated with snails; antennae sometimes elongated; 3rd segment rarely circular in profile; 2nd basal and anal cells short; sub-costa complete, well separated from vein 1; costa complete; femora bristly, often with a short bristle at the centre of the front face of the middle femur (23 genera, 65 species).



Note: some Helcomyzidae (38 above) may key out here if the costal spines are poorly developed. They have much longer 2nd basal and anal cells and a 3rd antennal segment circular in profile, with short arista.

41—Antennae very long and thin.



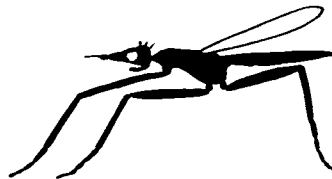
—PSILIDAE

Psilidae: g. *Loxocera* Mg.; very unusual long, black and reddish-yellow flies with a resemblance to Ichneumons; Wings have the characteristic cross-fold of *Psilidae* (see 46 below).

—Antennae not unusually long (3rd segment never longer than the diameter of an eye).

—42

42—Long, thin flies with long, thin legs.

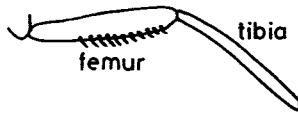


—43

—Flies of much more compact build.

—45

43—Hind femora thickened, with two rows of spines underneath.



—MEGAMERINIDAE

Megamerinidae: Abdomen long and thin, somewhat constricted basally; thorax and abdomen blackish, legs yellowish-brown; wings narrow and long, with 1st basal cell over half the length of the wing (1 genus, 1 species).

—Hind femora without spines.

—44

44—Anal cell convex apically.

—TANYPEZIDAE

Tanypezidae: very long, thin flies; four bristles on the scutellum (rear end of the thorax); top of head silvery; 6-8 mm long; rare (1 genus, 1 species).

—Anal cell not convex apically.

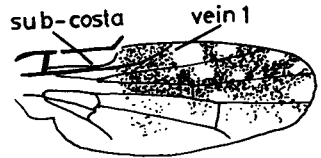
—MICROPEZIDAE

Micropezidae: long, thin flies; two bristles on the scutellum (rear end of the thorax); veins 3 and 4 converge apically; ocellar bristles (forward-facing bristles on the ocellar triangle) absent (3 genera, 9 species).

45—1-3 pairs of black, incurved, lower orbital bristles.

—TEPHRITIDAE

Tephritidae: small flies, usually with patterned wings; sub-costa runs parallel to vein 1 but fades apically after a sharp (often right-angled) bend towards the costa; costa broken at the apex of the sub-costa, and rather indistinctly near the humeral cross-vein (30 genera, 75 species).



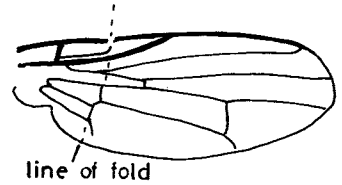
—No black, incurved, orbital bristles.

—46

46—Wings with an apparent cross-fold running from a break in the costa, across the fork in veins 2/3 across the ends of the 2nd basal and anal cells and out to the rear margin.

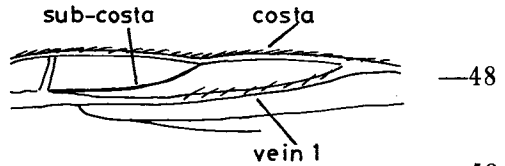
—PSILIDAE

Psilidae: 2nd basal and anal cells quite large with the cross-veins closing them almost in line; mesopleural and sternopleural bristles absent (see 51 below). Ocellar triangle quite large (3 genera, 25 species).



—Wings without this cross-fold; any break in the costa near the end of vein 1 not in line with the fork in veins 2/3 or the ends of the 2nd basal and anal cells. —47

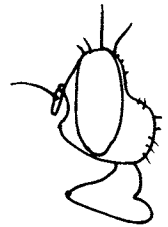
47—Vein 1 with hairs on the UPPER side.



—Vein 1 bare.

48—Back of head strongly concave above, convex below. —PLATYSTOMATIDAE

Platystomatidae: g. *Platystoma* Mg. small flies with patterned wings; membrane of wing darkened, with numerous small, clear spots; proboscis very stout (2 genera, 2 species).

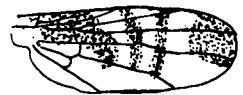


—Back of the head not shaped in this way.

49—Small, shining black flies with black halteres.

—PLATYSTOMATIDAE

Platystomatidae; g. *Rivellia* R-D.; small, shining greenish- or bronze-black flies with narrow patterned wings; antennae with 3rd segment long and pointed; upper part of frons brown.



—Not shining black flies with black halteres.

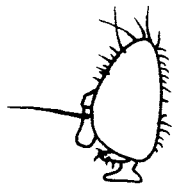
—OTITIDAE

Otitidae: small to medium-sized flies, often with patterned wings; face often with grooves to accommodate the antennae; anal cell often with the lower corner extended into a point. Post-vertical bristles parallel or divergent; frons often covered with short hairs (11 genera, 21 species).

50—Black, shining, rather hairy flies.

—LONCHAEIDAE

Lonchaeidae: small, shining metallic bluish- or greenish-black, rather hairy flies; 3rd segment of antenna usually long, like a house-fly; 1 pair of orbital bristles; post-vertical bristles divergent; wings sometimes yellow tinted; dorsal pre-apical bristles usually absent from hind tibiae (3 genera, 29 species).



—Not shining, black, hairy flies.

—51

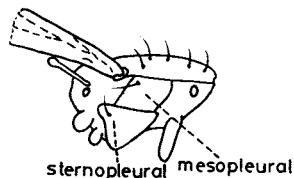
51—Post-vertical bristles present (see 12 above).

—52

—Post-vertical bristles absent.

—OPOMYZIDAE

Opomyzidae: mesopleural and sternopleural bristles present; 2nd basal and anal cells small; 3rd antennal segment short, rounded; small flies with spotted or clouded wings; usually with 1 pair of up-swept orbital bristles (2 genera, 14 species).

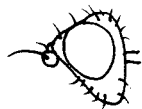


52—Post-vertical bristles convergent.

—CHYROMYIDAE

Note: *Palloptera muliebris* (Harris), (Pallopteridae, 54 below), which has crossed postvertical bristles, will key out here. It is a brownish fly with patterned wings and a more rounded head.

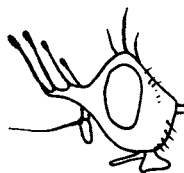
Chyromyidae: small, yellowish flies with very short antennae; face receding (weak chin); sub-costa complete, but weak apically; costa with a break near the end of vein 1; 2-3 pairs of orbital bristles (3 genera, 6 species).



—Post-vertical bristles parallel or divergent.

—53

53—Frons produced into an unusual projection bearing large, blunt spines; hind tibia with short, black spurs underneath. *Trypeta cornuta* (Scop).



—TEPHRITIDAE

(see 45 above)

—Frons normal, without unusual projections.

—54

54—Wings without dark markings; small dark flies.

— OTITIDAE
(see 49 above)

—Wings with dark markings.

—PALLOPTERIDAE

Pallopteridae: wings conspicuously longer than abdomen; proboscis short and thick; sub-costa complete, well separated from vein 1; costa broken at the end of the sub-costa; lower corner of anal cell never drawn out into a sharp point, the cross-vein closing it usually convex and the angle it makes with vein 6 well over 90° (2 genera, 11 species).

Note: *Seioptera vibrans* (L) (Otitidae) has the lower corner of the anal cell drawn out into a point, and a dark spot on the wingtip.

ACKNOWLEDGEMENTS

I wish to thank the many Dipterist friends who have been so helpful to me during the writing and testing of this key, and in particular Peter Chandler, Brian Cogan and colleagues, Jonathan Cole, David Henshaw, Diane Howse, Tony Irwin, Ian McLean and Alan Stubbs. My special thanks go to Henry Disney for first suggesting to me the idea of writing a new family key, for much helpful comment and for the use of facilities at Malham Tarn Field Centre.

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