Picture-wing Flies

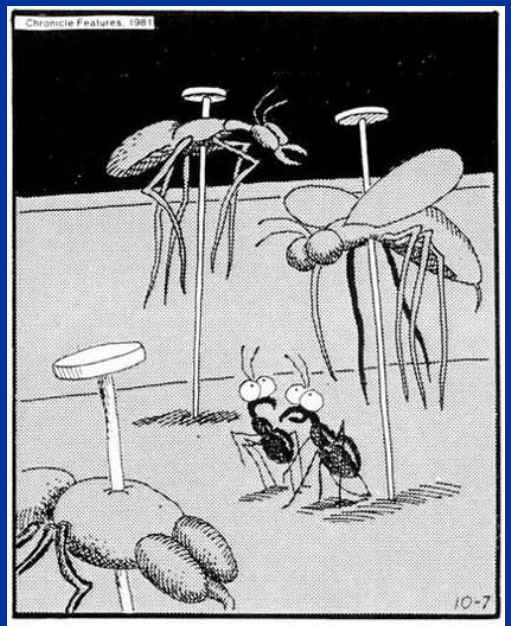
Tephritidae, Ulidiidae, Platystomatidae & Pallopteridae

David Clements

Contents

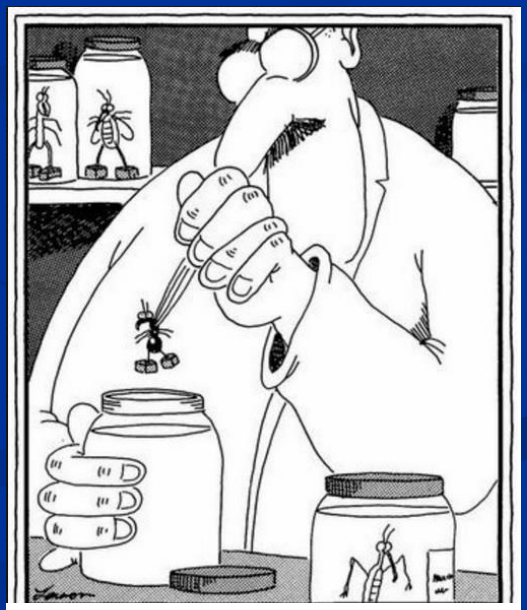
- Introduction & Overview
- Techniques, Equipment, Skills, Literature etc
- Synopsis of the Families
- Key Species

The last thing a fly ever sees



"Gad, I hate walking through this place at night."

How entomologists pass away

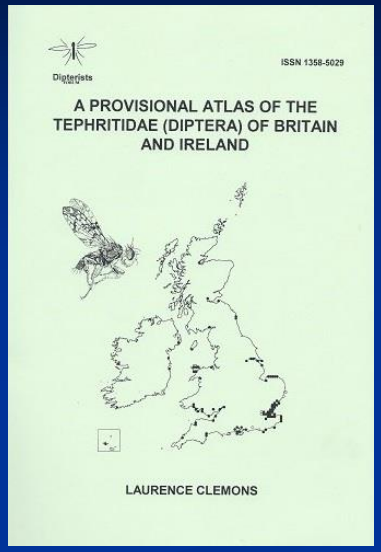


Scenes from the entomology underworld

What Are 'Picture-wing Flies'?

Tephritidae (c.80 spp)

- Now called 'Fruit-flies'
- Has its own Recording Scheme
- 2008 Atlas on DF website
- New Atlas pending



So What Else Are They?

Ulidiidae (20 spp)

- True 'Picture-wing Flies'
- Used to be called 'Otitidae'
- Has a Recording Scheme for GB&I, which also includes:


Herina frondescentiae


Platystoma seminationis

Platystomatidae (2 spp)

- Known as 'Signal-flies'

Pallopteridae (13 spp)

- Known as 'Flutter-flies', at least in the US
- Called 'Long-winged Flies' in Britain?


Palloptera muliebris

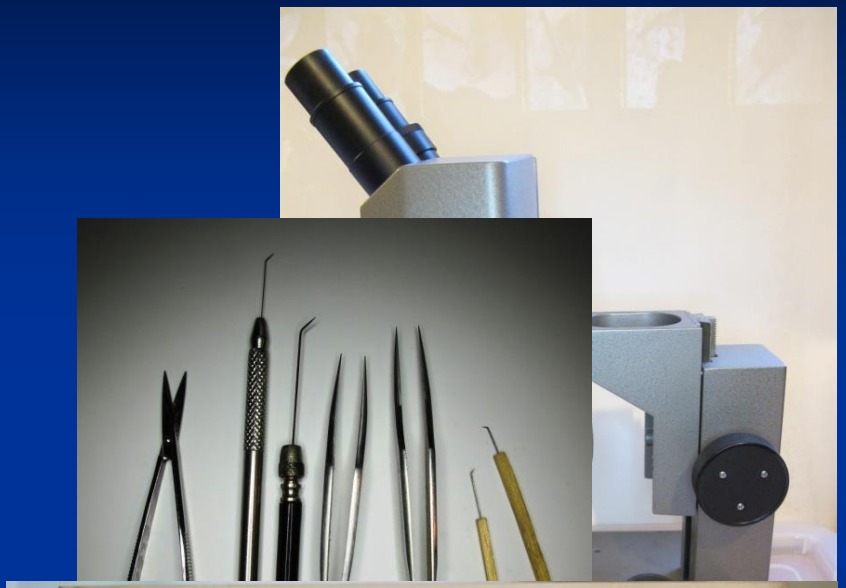
All 4 families show 'Wing-waving' behaviours

Rhagoletis basiola
Rose-hip Fruit-fly
Canada
Film: Stuart Tingley

- Complex ritualised or 'stereotypical' behaviour sequences
- Wings raised, lowered, rotated, oscillated or vibrated
- Often while walking in a defined pattern
- Courtship & mating, resource-guarding and/or territorial activity

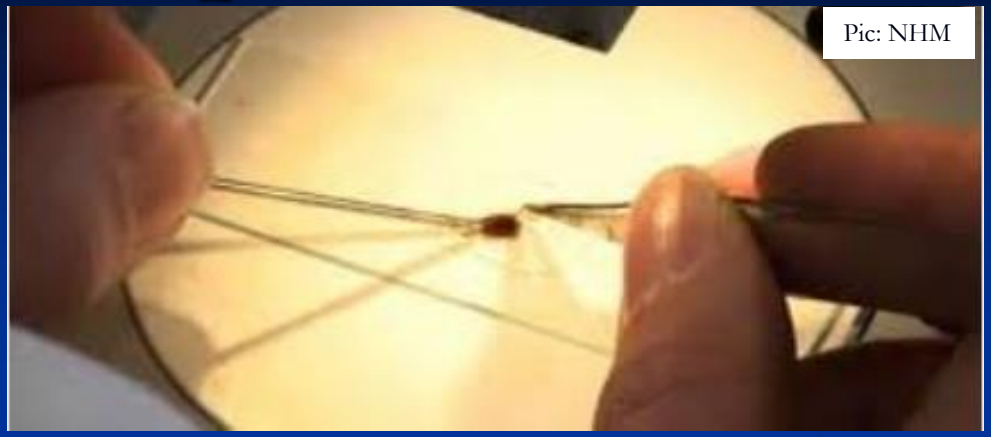
What Do You Need?

- Microscope
  - Binocular: 10-20x, 40x
  - Compound: 100x
- Fine forceps, needles, probes, microscopy bits
- Collection – for comparison, voucher-storage
- Genitalia preparations



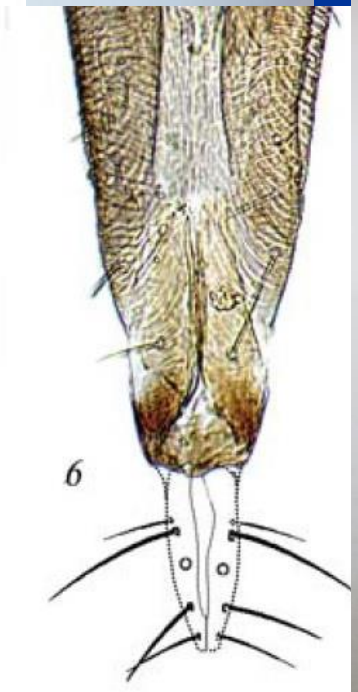
Pic: UCL

Genitalia Preparaions

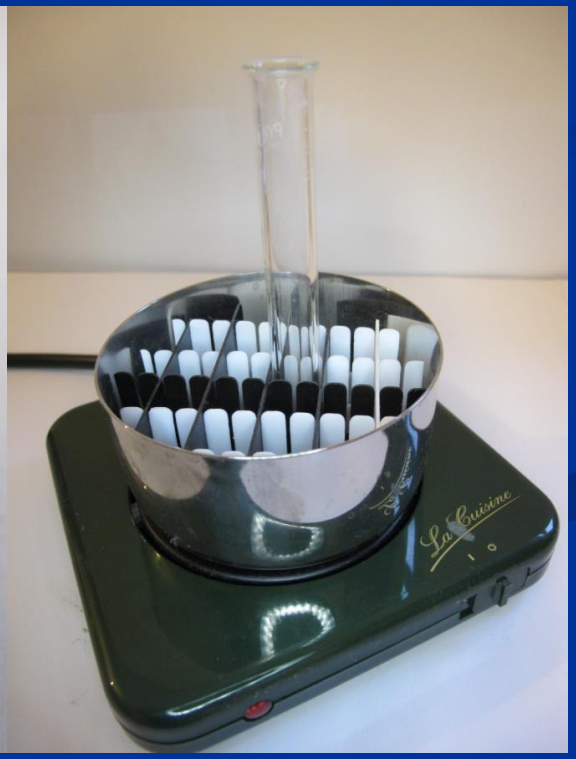


Pic: NHM

Pic: E Kameneva



Pic: E Kameneva



Field & Photo Identification

Tephritidae (c.80 spp)

- 20-25% to species
- 30-40% to genus or species-group

Ulidiidae (20 spp)

- 75% to species

Platystomatidae (2 spp)

- 100% to species

Pallopteridae (13 spp)

- 80% to species

Where to Find Them, and When?

Tephritidae

- Flower-rich habitats, especially grasslands, ruderal vegetation, tall wetlands, emergent vegetation, 'edge' habitats
- Lots of Asteraceae (=Compositae)
- Less common in shaded habitats
- Mostly from mid-summer onwards

Ulidiidae

- Species-rich grasslands, marsh, fen
- Flower-rich rides, clearings & woodland edges
- Coastal habitats, dunelands, saltmarsh, slacks
- Calcareous habitats (especially grasslands)
- Rotting vegetation: farmyards, stables, compost heaps, liquid organic sludge
- Early summer onwards

Platystomatidae

- Rank, shaded habitats
- Woodlands, hedge-bottoms
- Grasslands & marshes

Pallopteridae

- Woodlands: Rides and clearings, edges
- Shaded habitats: hedges and scrub
- Grasslands: tall swards
- Early summer onwards

How to Collect Them?

- Sweeping
- Pan trap; Malaise trap; SLAM trap; interception traps etc
- Side-pin with micropin
- Extend genitalia where possible
- Stage-mount, with genitalia in tubes below

Identification

Tephritidae

RESL key by Ian White (1988)

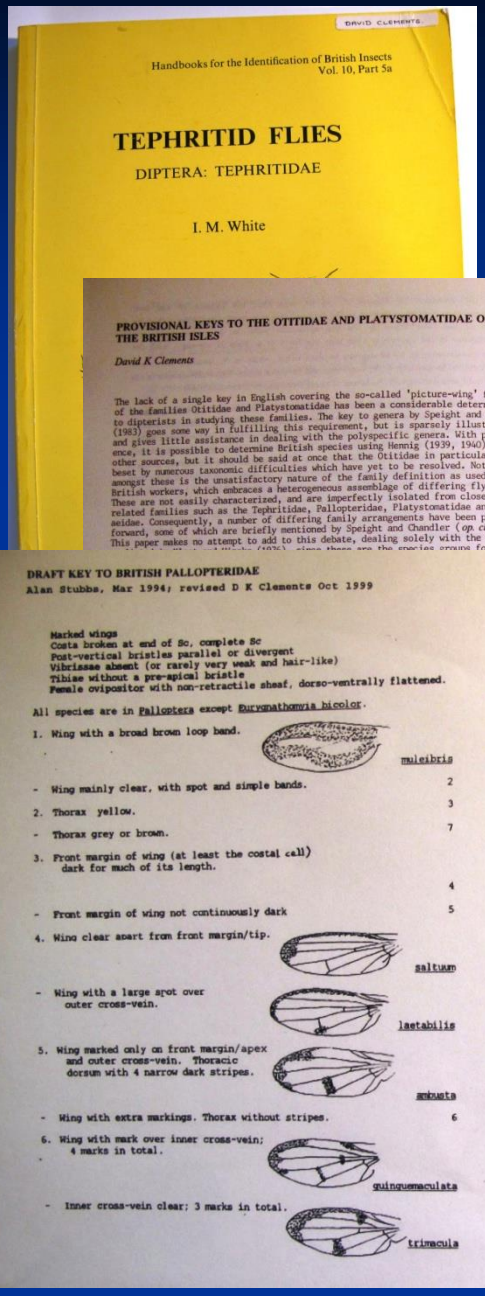
Ulidiidae & Platystomatidae

Clements (1990); Clements & Merz (1998 *Herina* spp) – Dipterists Digest

Pallopteridae

Key by Stubbs & Clements (1999)

- PDFs available from DKC

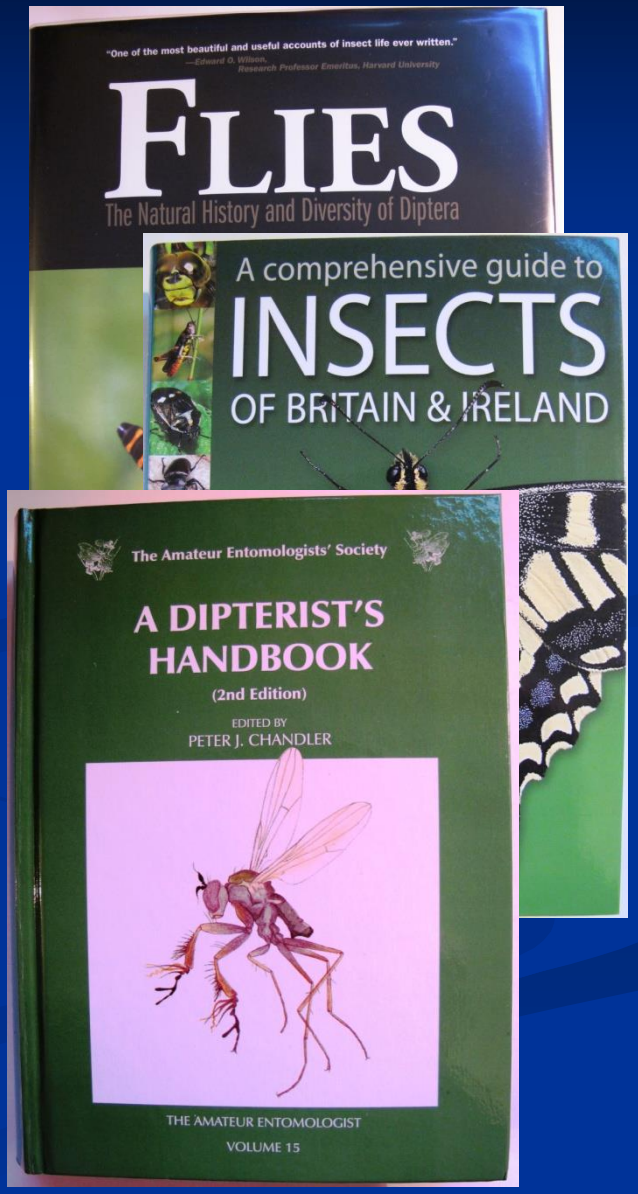


Other Resources

'*Flies: The Natural History & Diversity of Diptera*' by Steve Marshall (2012)

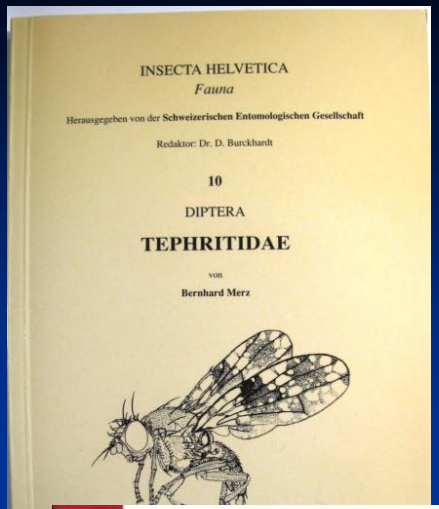
'*Comprehensive Guide to Insects of Britain & Ireland*' by Paul Brock (2014)

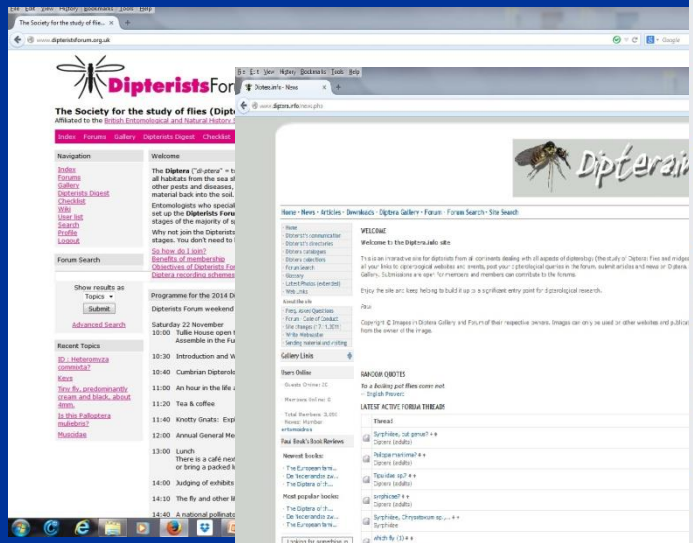
'Dipterist's Handbook' Ed. Peter Chandler (2010, 2nd Edition) AES

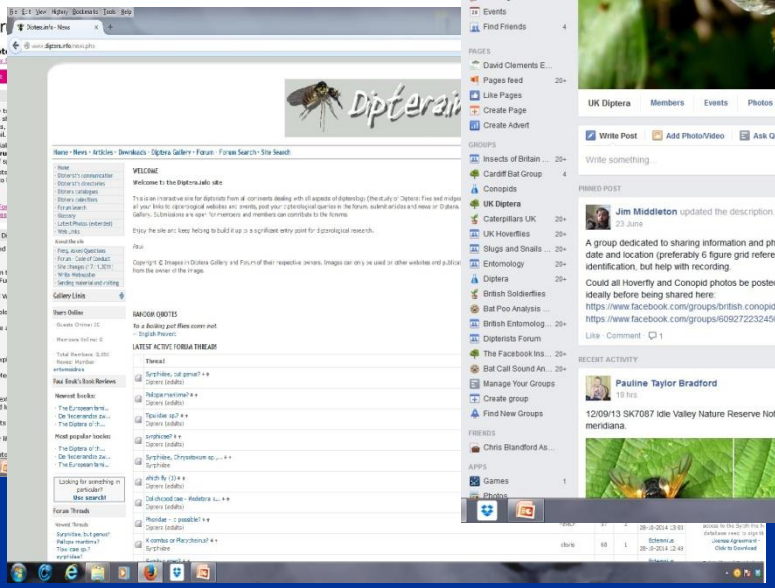


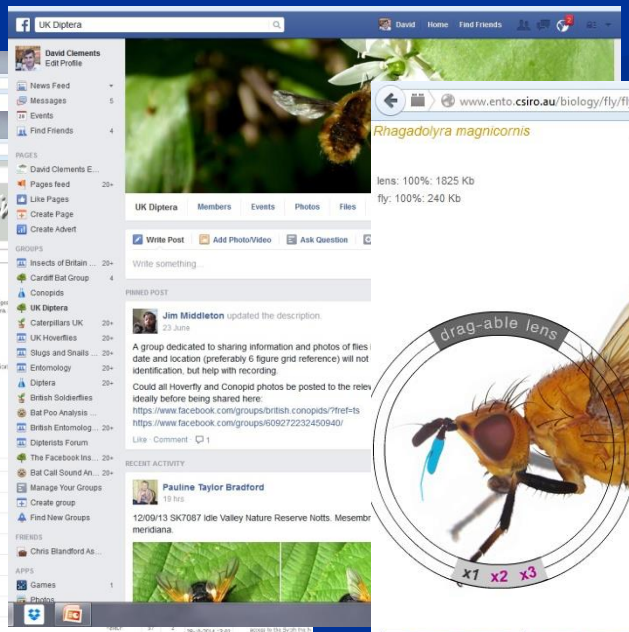
- European publications
- Dipterists Forum website
- Diptera Info website
- Various Facebook groups
- Anatomical Atlas of Flies website

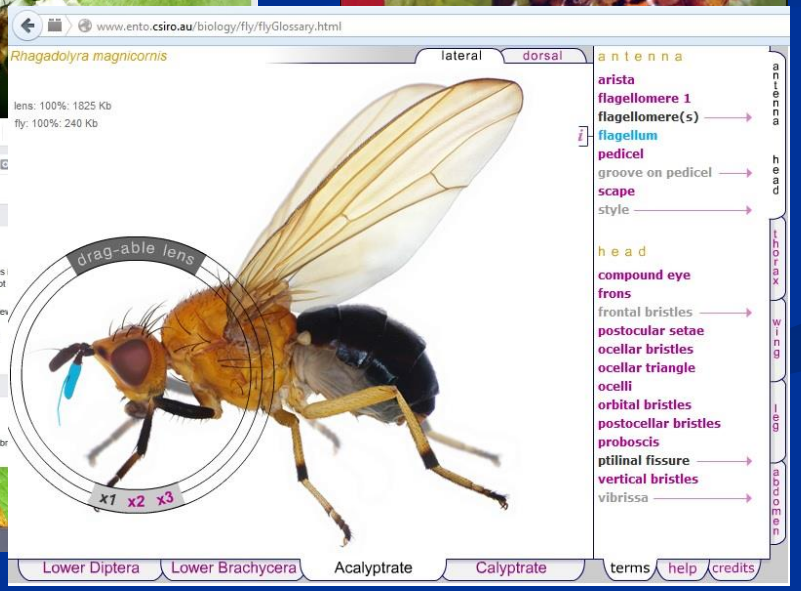
  http://www.ento.csiro.au/biology/fly/flyGlossary.html





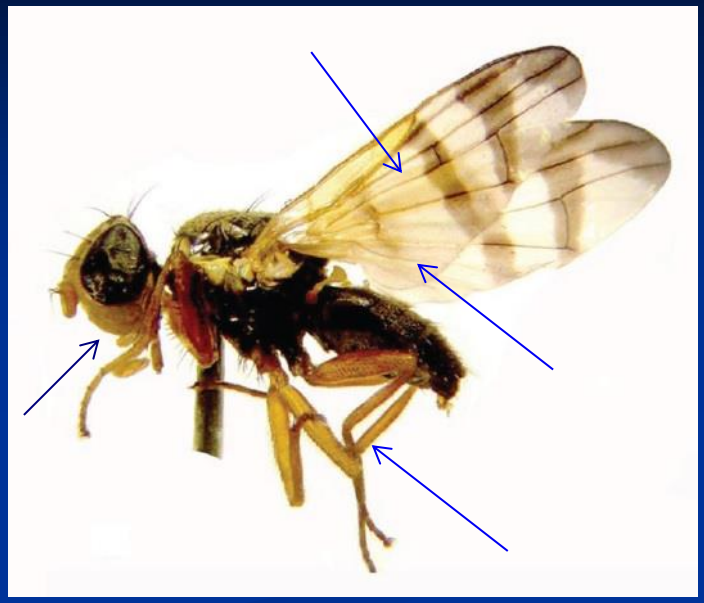


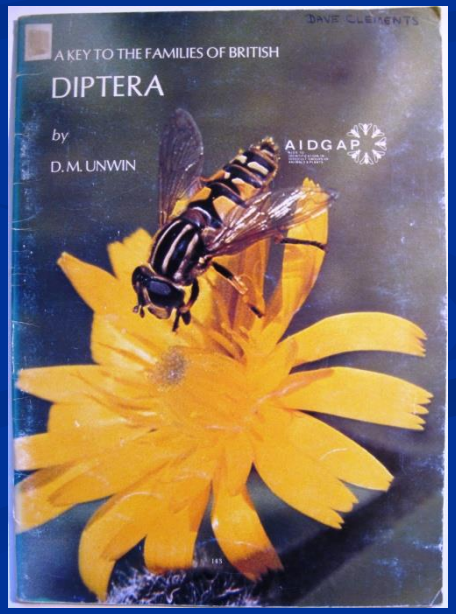




Recognising the Picture-Wings

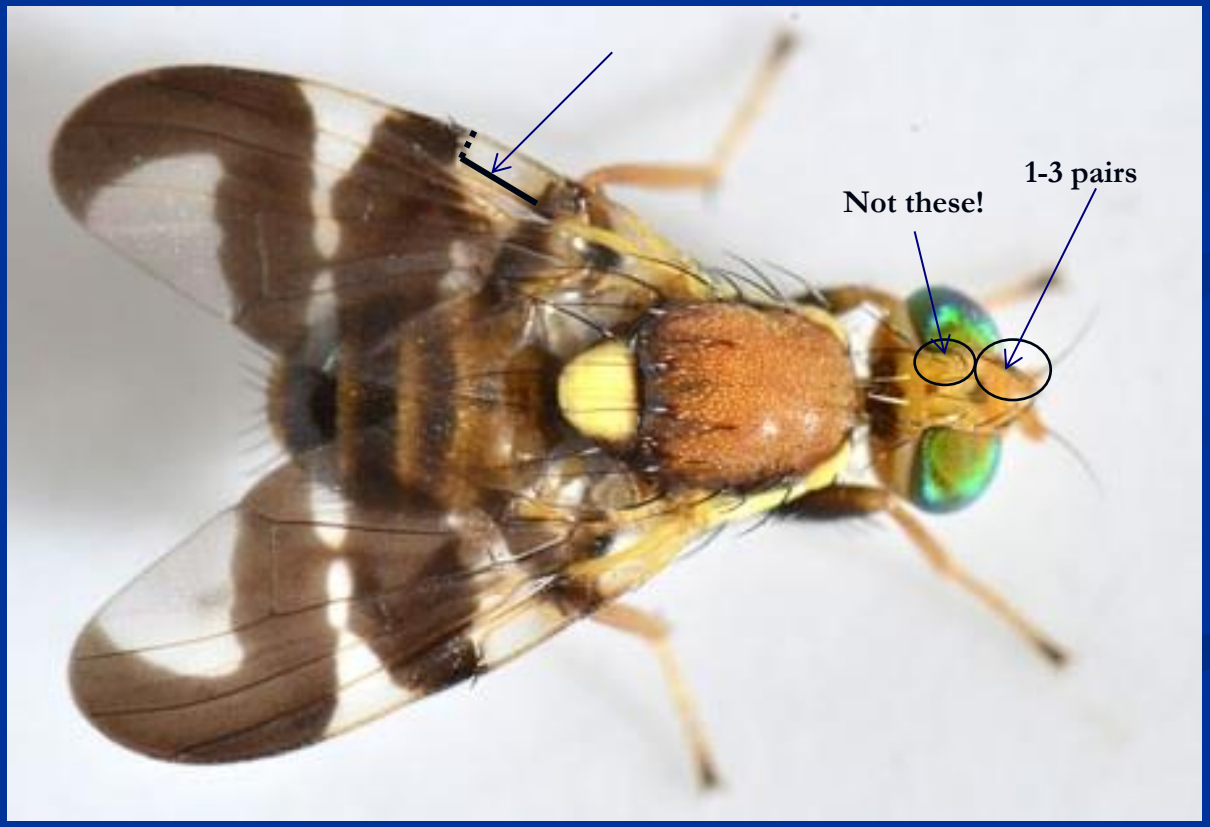
- Small to medium acalypterate flies with patterned wings
- 'Complete' venation, ie 1st & 2nd Basal Cells, Discal Cell & Anal Cell all present
- Anal Vein long, usually reaching wing margin
- No vibrissae
- No dorsal Pre-apical Setae on Tibiae
- FSC family key by Dennis Unwin (1981)





Tephritidae - Recognition

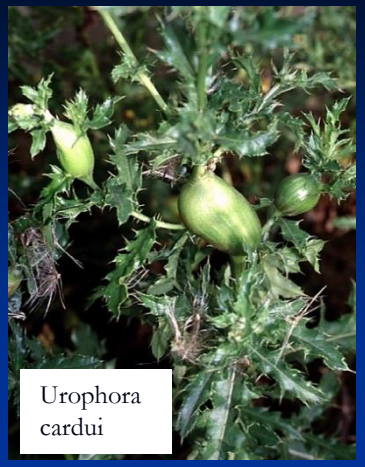
- Right angled bend in vein Sc, which often becomes faint before it joins Costa
- Incurved lower frontal setae (usually black)



Tephritidae

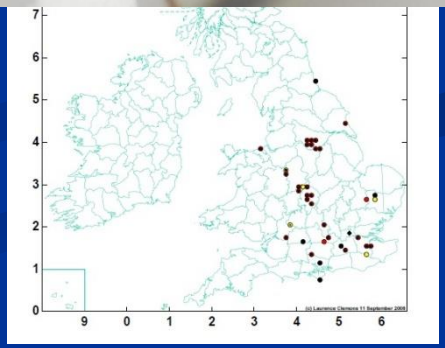
Phytophagous species

- Great majority develop in Asteraceae (c.70 spp)
- Other plant families: Apiaceae (Umbelliferae), Berberidaceae, Campanulaceae, Cicurbitaceae, Rosaceae, Liliaceae (1-2 spp each)
- Larvae in 'Borings', Mines, Galls
- Most spp feed in the capitulum ('fruit')
- Others in leaves, stems & roots


Urophora cardui

Predator/Brood Parasite (1 sp)

- *Euphranta toxoneura* – in sawfly galls on Willows

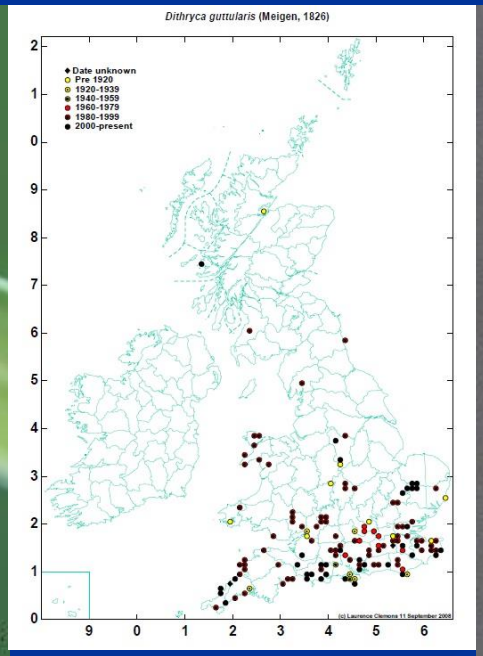


Phytophagous Tephritids

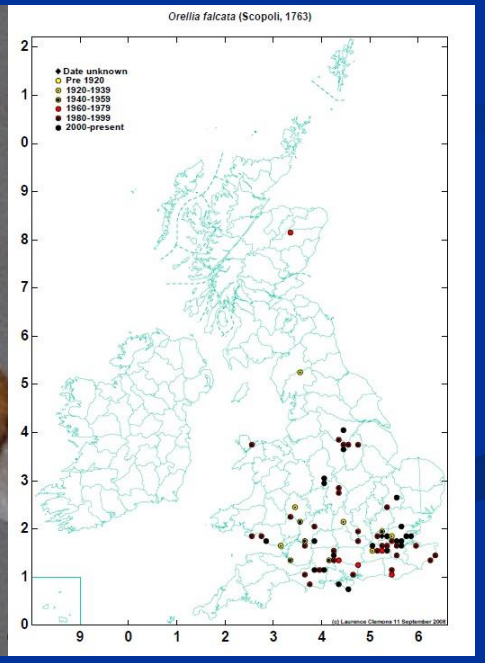
Roots & Stem-bases -Borings, Galls & Mines (c.5 spp)

- *Dithryca guttularis* – stem-base gall in Yarrow (Jul/Aug)
- *Orellia falcata* – root-borer in *Tragopogon* (May/Jun)


Pic: Nikola Rahme




Pic: Jordi



Leaves & Stems - Borings, Galls & Mines (c.16 spp)

Acidia cognata – leafmine in Colt's-foot (May/Jun)

Urophora cardui -stem-gall in Thistles (May-Jul)

Euleia heraclei – leafmine in Umbellifers (May-Aug)

Philophylla caesio - leafmine in various plants (Jul/Aug)

Pic: Mucha Fero

Leaves & Stems - Borings, Galls & Mines

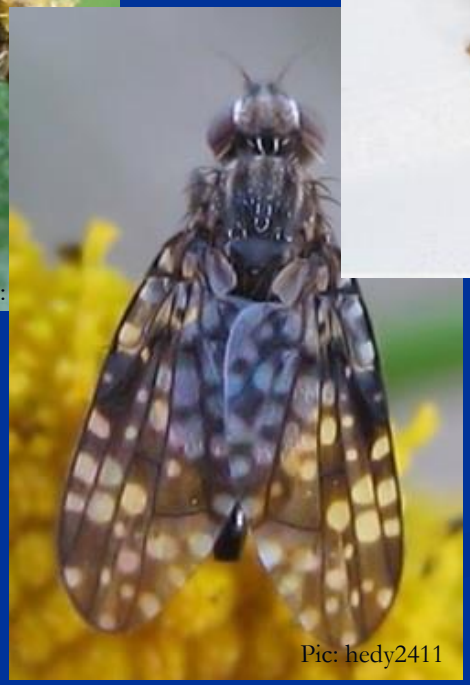
Oxyna parietina –stems of various composites (Apr-Jun)

Campiglossa misella – 1st Gen: Stem-gall in Mugwort (Jun-Oct)

Trypeta zoe – leafmines various composites (Apr-Aug)

Stemonocera cornuta – leafmines Hemp-Agrimony

Pic:



Pic: hedy2411

Pic: M le Masson

Fruits (Capitulum) - Borings & Galls (c.58 spp)

Urophora jaceana - galls Knapweed heads (May-Jul)

Anomoia permunda – Woody Rosaceae fruits (Apr-Jun)

Chaetorellia jaceae -Knapweed heads (Jun/Jul)

Chaetostomella cylindrica - many composites (May/Jun)

Pic: Stephen R

Pic: Brian Valentine

Pic: C Fortune

Fruits (Capitulum) - Borings & Galls

Merzomyia westermanni - Ragwort heads (Jul)

Dioxyna bidentis - *Bidens* and others (Aug/Sep)

Tephritis bardanae – Burdock heads (Aug-Oct)

Xyphosia miliaria - various composites (May-Sep)

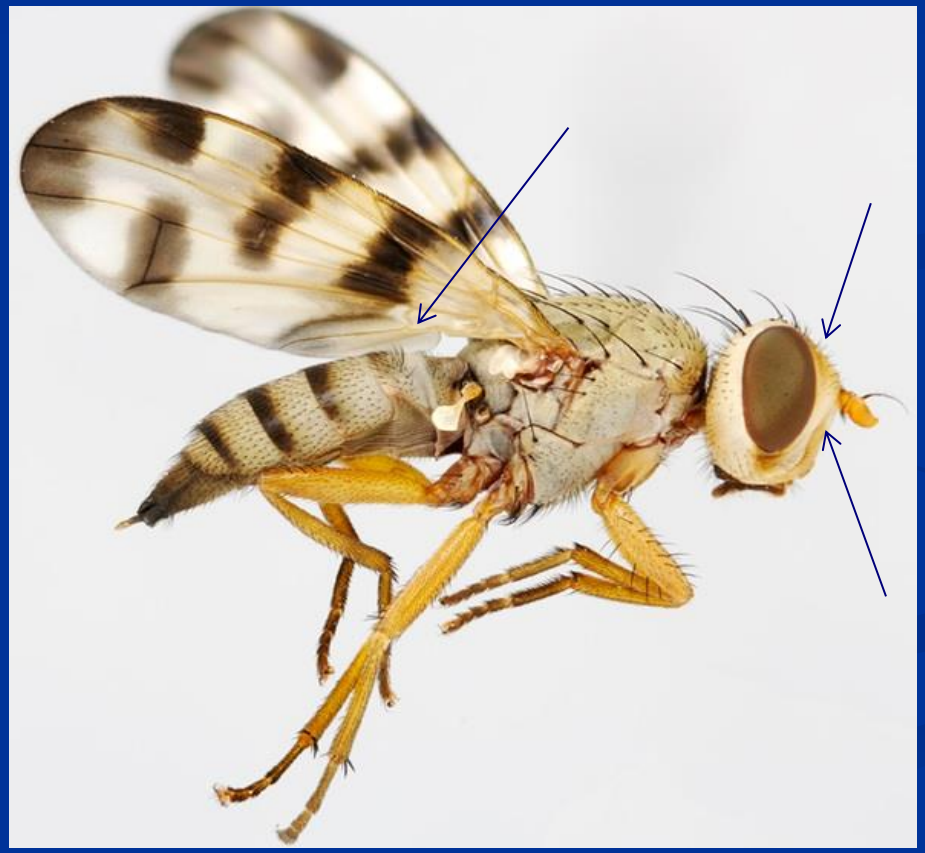
Pic: Michael Stemmer

Pic : hedy2411

Pic : pat_der2003

Ulidiidae - Recognition

- Small hairs across middle of frons
- Usually have grooves in face behind antennae
- Anal cell usually with triangular extension



Rotting vegetation, organic sludge, liquid dung

- Around stables, privies, farmyards, compost heaps, eutrophic marsh, nitrogenous sludge, dung

Grasslands & Marsh Habitats

- *Ceroxys urticae:* wet marsh, fresh & salt


Pic: Hans Watson


Pic: Tomsur

- *Herina frondescentiae:* lowland marsh, dune slacks, rush-pastures, flushes

- *Herina nigrina:* dry calcareous grasslands, including coastal cliffs


Pic: Mucha Fero


Pic: Williamsnr

- *Herina lugubris:* calcareous grasslands & marsh, damp scrub

Otites guttata: damp grasslands, reed beds, often with Hogweed


Pic: Andreas Haselbroeck


Pic: Steven Falk

Dorycera graminum

- 'Phoenix Fly' – UK BAP
- Tall grasslands, often rank
- Larvae on grasses? Adults feed at umbellifers

Coastal & Maritime Habitats

- *Melieria* spp: mainly coastal, saltmarsh and maritime vegetation, dune slacks

- *Tetanops myopinus* in Marram Grass

Trees

- *Myennis octopunctata:* Poplars

- *Homalocephala* spp: Aspen & Conifers

Platystomatidae - Recognition

- **Two distinctive species in Britain**

- *Platystoma seminationis:* probably saprophage, possibly also fungivore
- *Rivellia syngenesiae:* grasslands & marshes, usually with *Lotus* spp; probably in root nodules

Pallopteridae - Recognition

- Wings longer than abdomen
- Broad, rounded wings

Phytophagous Species

- *Palloptera umbellatarum:* Thistles

- *Palloptera trimacula:* Angelica, Hogweed

- *Palloptera quinquemaculata:* Grasses


Pic: Tristram Brelstaff


Pic: DavidG

- *Palloptera saltuum:* Hogweed

Associated with Beetles

- Mainly bark-beetles (Scolytidae)
- Predators or commensals feeding on frass etc
- *Palloptera muliebris*

Pic: Albert de Wild

Pic: Geir79

- *Palloptera usta*

Eurygnathomyia bicolor

- Biology unknown – very rare
- Separate family?

THANK YOU!