Flower-Insect Timed Count: insect groups identification guide

PoMS-Ký

This guide has been developed from a document designed to support the Flower-Insect Timed Count survey (FIT Count) that forms part of the Cyprus Pollinator Monitoring Scheme (PoMS-Ký). The RIS-Ký Project has adapted this methodology from the UK Pollinator Monitoring Scheme (PoMS) and is intended to form part of a proposed pollinator monitoring scheme on Sovereign Base Areas in Cyprus and the wider island PoMS-Ký as applicable.

What is the background to this project?

PoMS-Ký aims to start to provide much-needed data on the state of the Cyprus' insect pollinators, especially wild bees and hoverflies, and the role they fulfil in supporting farming and wildlife. This project will focus on Sovereign Base Areas, but will be applicable across the whole of Cyprus with the plant and pollinator taxa considered.

The PoMS FIT Count, from which this project originates, is part of the Pollinator Monitoring Scheme (PoMS) within the UK Pollinator Monitoring and Research Partnership, co-ordinated by the Centre for Ecology & Hydrology (CEH). It is jointly funded by Defra, the Welsh and Scottish Governments, JNCC and project partners, including CEH, the Bumblebee Conservation Trust, Butterfly Conservation, British Trust for Ornithology, Hymettus, the University of Reading and University of Leeds.

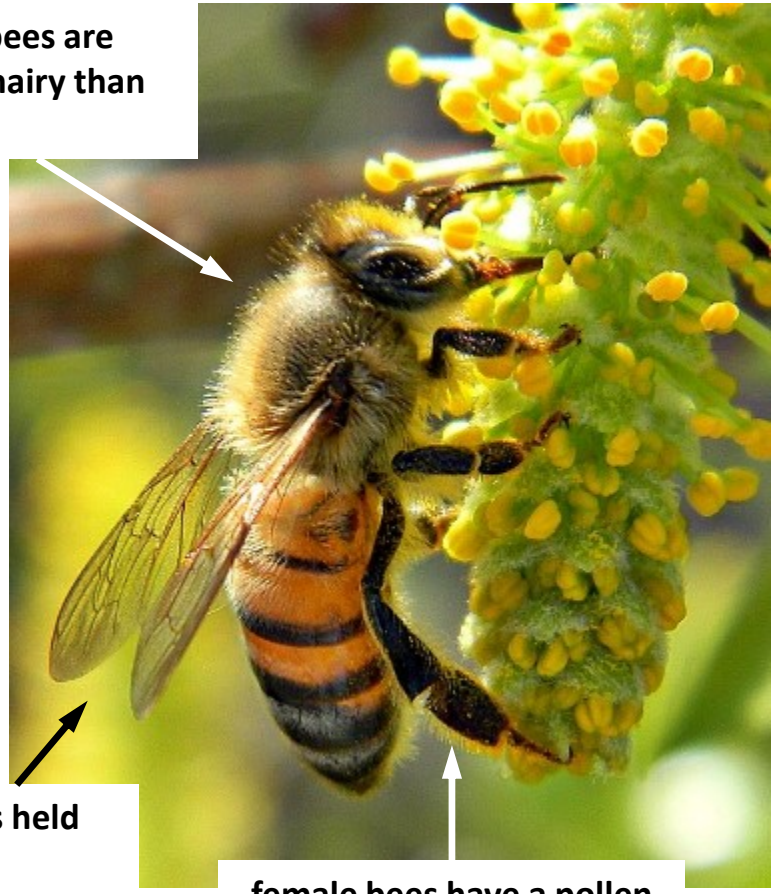
For further information about RIS-Ký, please visit www.ris-ky.info
For further information on PoMS, please visit: www.ceh.ac.uk/pollinator-monitoring

Please note, some of the photos used in this guide are from species found in the UK, not in Cyprus, but are used for this guide to represent examples of those genera also found in Cyprus to illustrate the key anatomical features we are looking to demonstrate. We would like to thank all the photographers for the use of their pictures.

DARWIN INITIATIVE
Joint Services Health Unit
RIS-Ký Researching Invasive Species in Kýpros
Akrotiri Environmental Education Centre
CEH Centre for Ecology & Hydrology NATURAL ENVIRONMENT RESEARCH COUNCIL
POMS UK Pollinator Monitoring Scheme

Bee or wasp (Hymenoptera)? – 1

Honey Bee (family Apidae, species *Apis mellifera*)
Photo © Bob Peterson/Wikimedia Commons

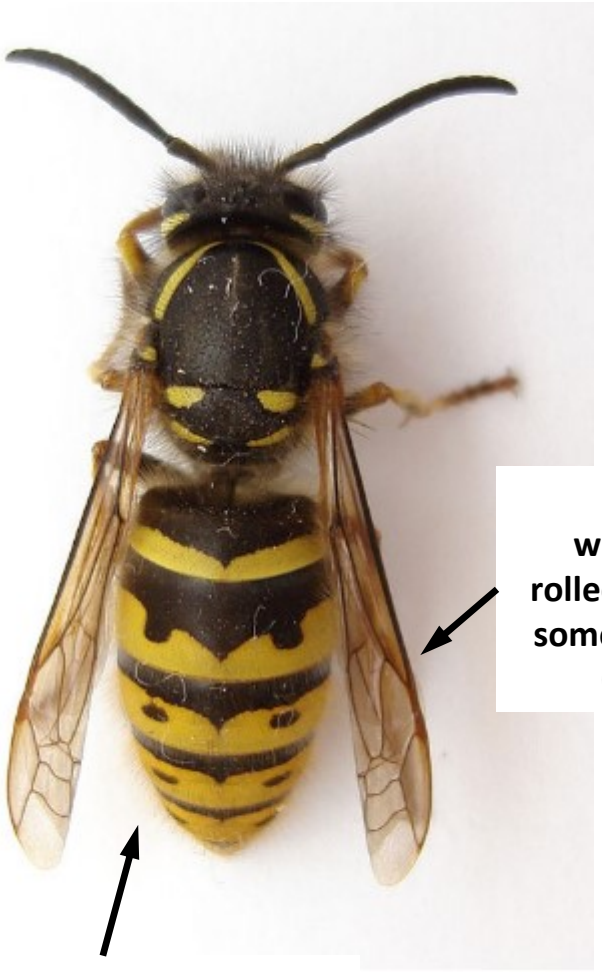


most bees are more hairy than wasps

wings held flat

female bees have a pollen basket, usually on the hind legs or under the abdomen

A social wasp (family Vespidae, genus *Vespula*)
Photo © Trounce/Wikimedia Commons



at rest, wings are rolled up for some wasps (not all)

less obviously hairy, and often with very contrasting colours

FIT count category: Honey bee

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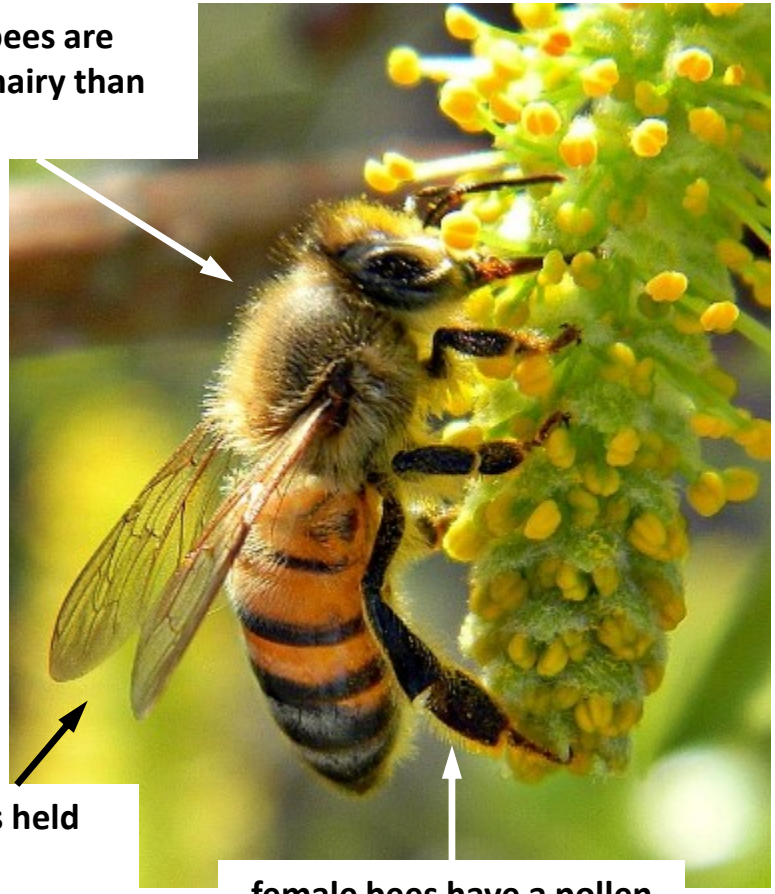
FIT count category: Wasp

Bee or Hornet (Hymenoptera)? – 1

Honey Bee (family Apidae, species *Apis mellifera*)
Photo © Bob Peterson/Wikimedia Commons



most bees are more hairy than wasps

wings held flat

female bees have a pollen basket, usually on the hind legs or under the abdomen

FIT count category: Honey bee

Oriental Hornet (family Vesipdae, species Vespa orientalis
Photo ©MBotham

at rest, wings are rolled up like other wasps

less obviously hairy, and often with very contrasting colours, like other wasps but generally larger

FIT count category: Wasp

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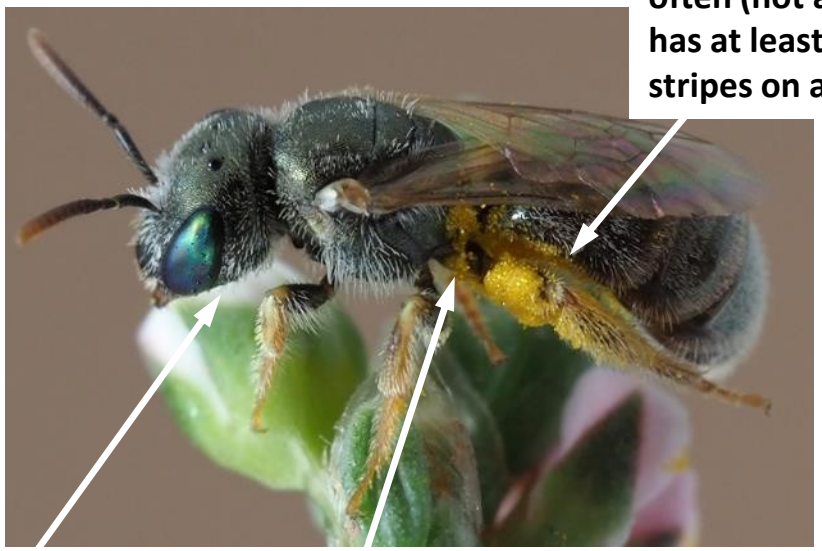
Bee or wasp (Hymenoptera)? – 2

There are a number of small and dark species in both groups

A small solitary bee (family Halictidae)
Photo © Marios Phillipou



often (not always) has at least a hint of stripes on abdomen

some obvious hairs should be visible

female bees have a pollen basket, usually on the hind legs or under the abdomen

FIT count category: Solitary bee

A solitary wasp (family Crabronidae)
Photo ©Pantelis Charilaou

head often bulkier and more rectangular than for bees

no obvious hairs, no pollen basket

FIT count category: Wasp

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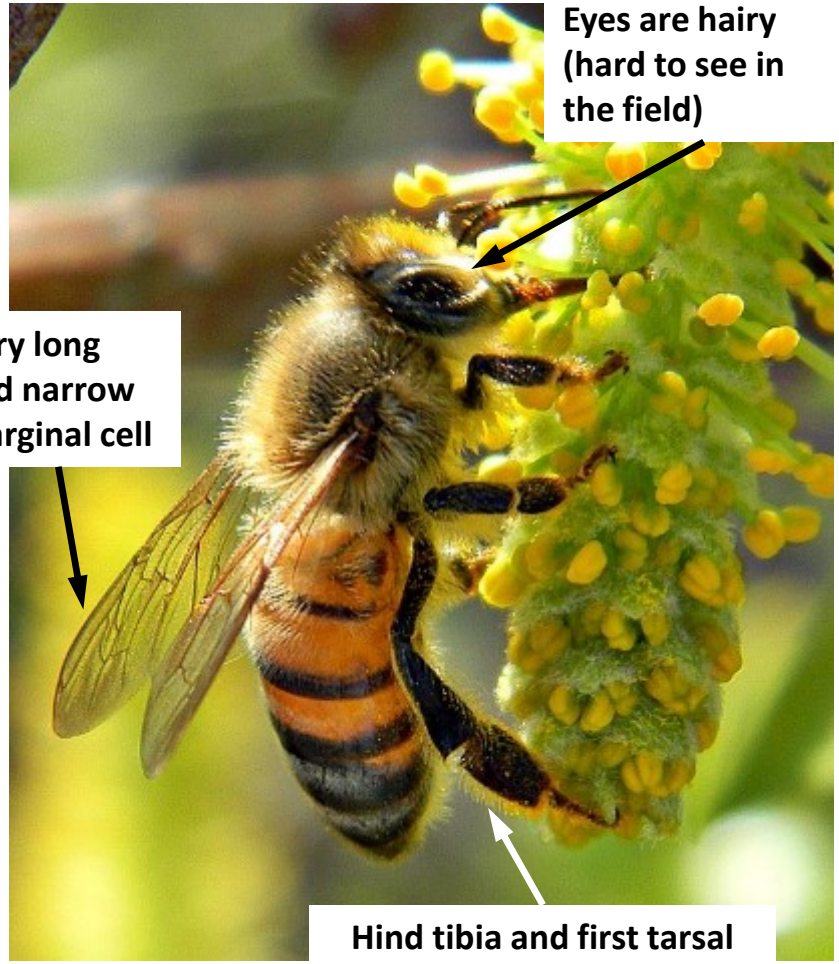
Recognising Honey bees (Hymenoptera)

Honey Bee (family Apidae, species *Apis mellifera*)
Photo © Bob Peterson/Wikimedia Commons

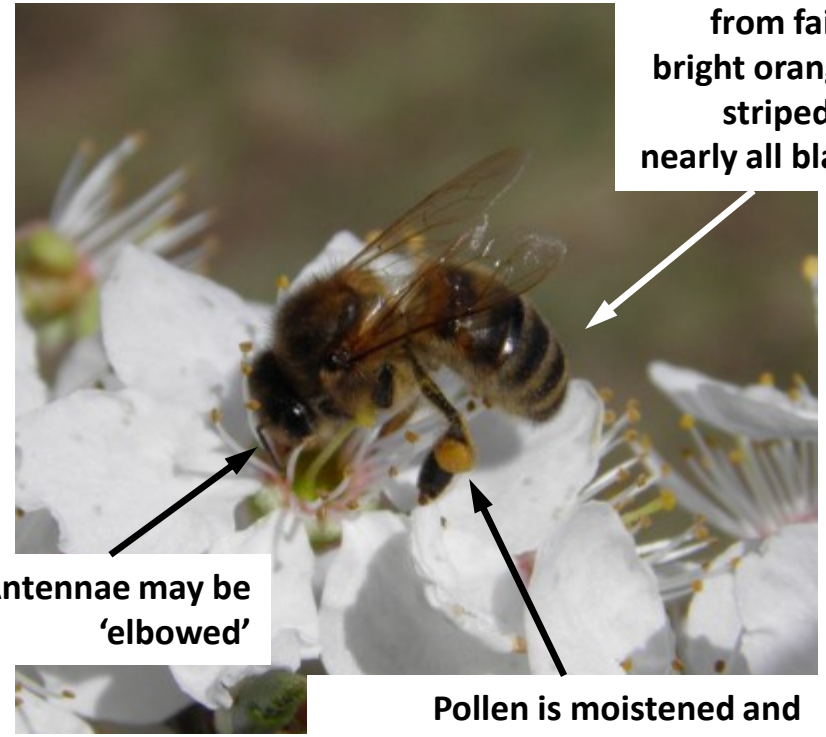


Eyes are hairy (hard to see in the field)

Very long and narrow marginal cell

Hind tibia and first tarsal segment very broad and flattened (in workers)

Honey Bee (family Apidae, species *Apis mellifera*)
Photo © Martin Harvey



Abdomen colour varies from fairly bright orange-striped to nearly all black

Antennae may be 'elbowed'

Pollen is moistened and collected in the basket on the hind tibia

FIT count category: Honey bee

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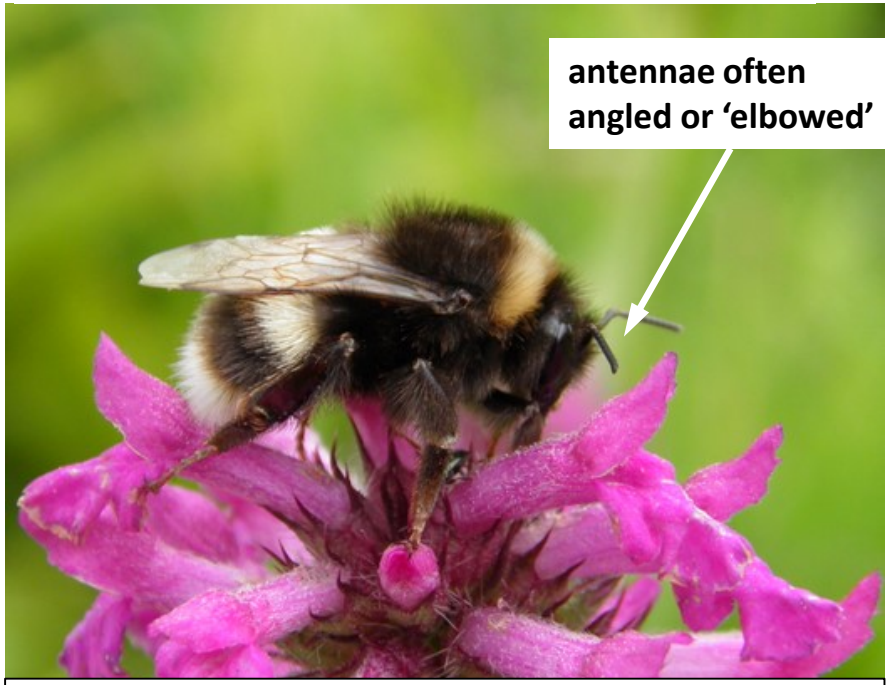
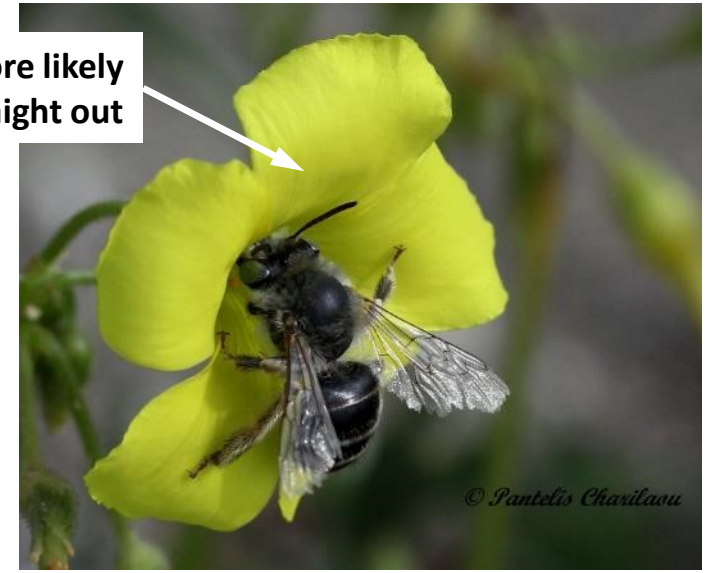
Bumblebee or solitary bee (Hymenoptera)?

A bumblebee (family Apidae, genus *Bombus*) Photo © Martin Harvey



Bumblebees:
- Very hairy / fluffy
- Rounded, almost globular in shape, often have tail 'tucked under' when visiting flowers
- Many have simple, contrasting colour bands
- Queens are larger than nearly all solitary species, but workers can be smaller than the larger solitaries

A solitary bee (family Apidae) Photo © Pantelis Charilaou



Solitary bees:
- Usually hairy, but usually less densely covered in hairs than bumblebees
- Usually more elongate in shape (but lots of variety, see next sheet)
- Colours usually more subdued and less contrasting than bumblebees
- Smaller than queen bumblebees, but the largest solitaries are bigger than small worker bumblebees

FIT count category: Bumblebee

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FIT count category: Solitary bee

Solitary bee examples (Hymenoptera)

There are many species of solitary bee in a range of families

Andrena haemorrhoa Photo © Martin Harvey

Some are very small! (but larger than 3mm long)

Photos © Mike Edwards

Andrena cineraria Photo © Aiwok/Wikimedia Commons

A leaf-cutter bee (genus *Megachile*)
Photo © Derrick Ditchburn/Wikimedia Commons

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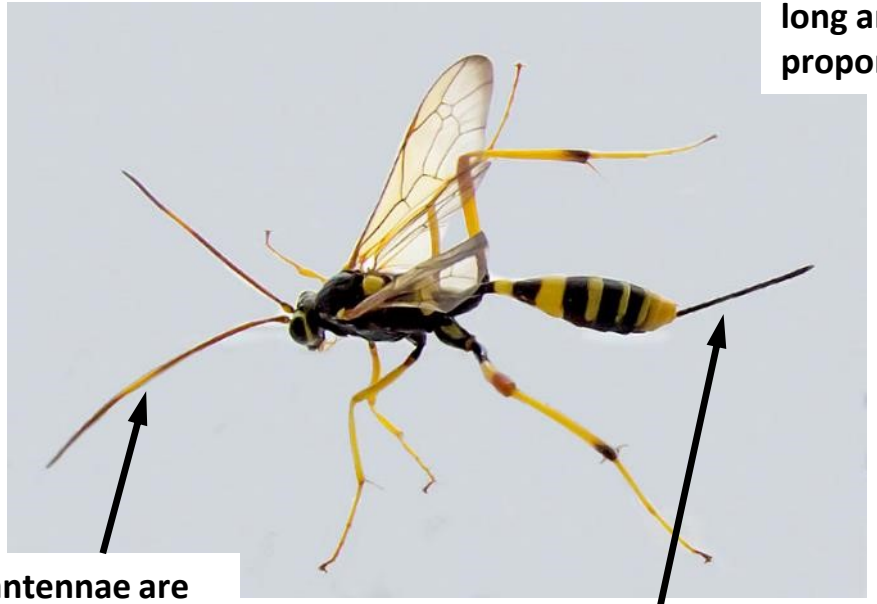
FIT count category: Solitary bee

Ichneumon wasps (Hymenoptera)

Sometimes called ichneumon ‘flies’ but these are wasps and should be counted as wasps

An ichneumon wasp (family Ichneumonidae)
Photo © Katya/Wikimedia Commons

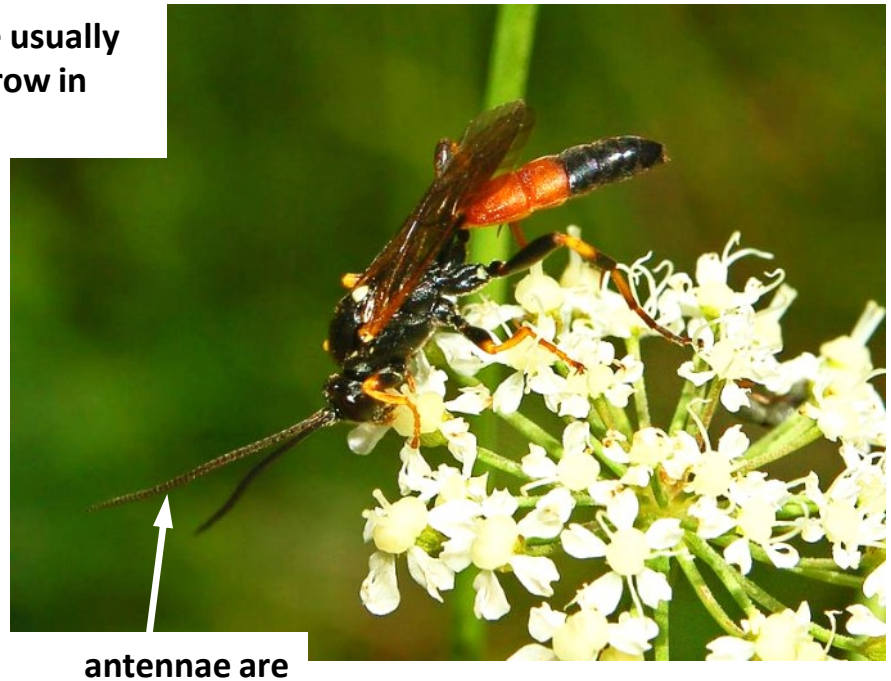


antennae are long with many small segments

females may have an obvious ovipositor at the tip of the abdomen

overall shape usually long and narrow in proportions

An ichneumon wasp (family Ichneumonidae)
Photo © Hectonichus/Wikimedia Commons



antennae are long with many small segments

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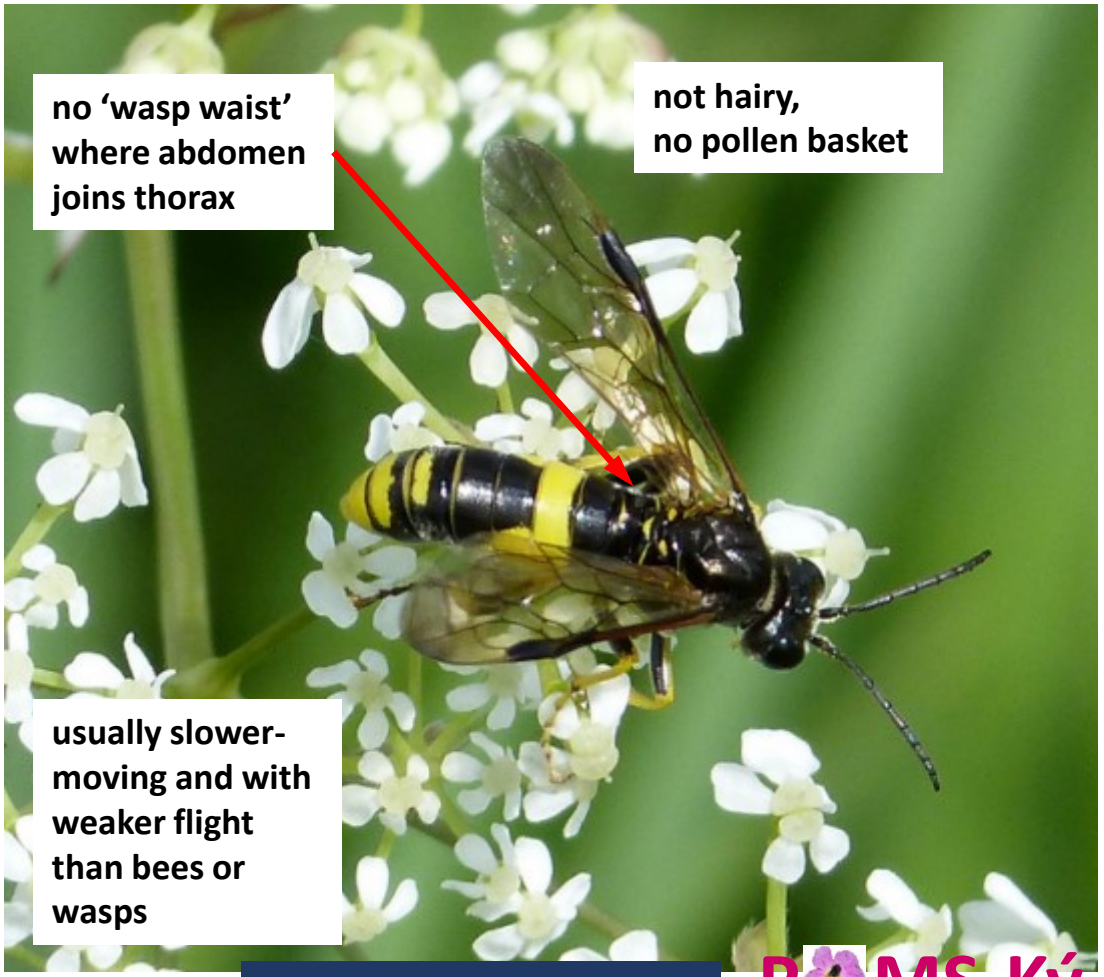
FIT count category: Wasp

Sawfly or wasp (Hymenoptera)?

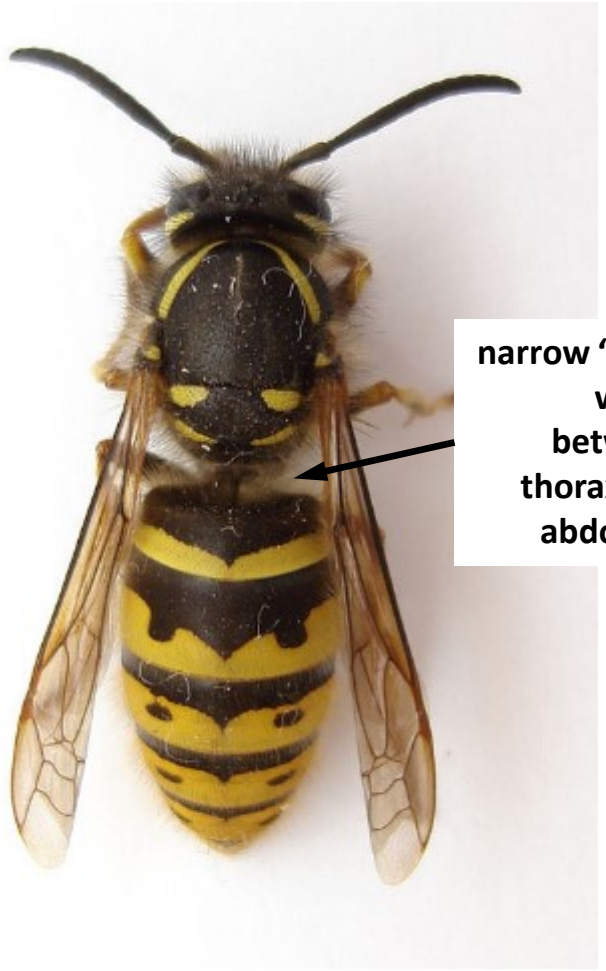
There are many different sawflies of differing sizes and colours – they are not true flies, and are related to bees and wasps in the Hymenoptera, but note that we are counting sawflies in the "Other" category

Sawfly (family Tenthredinidae)
Photo © gailhampshire/Flickr CC



FIT count category: Other known

A social wasp (family Vespidae, genus *Vespula*)
Photo © Trounce/Wikimedia Commons



FIT count category: Wasp

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Example of wasps (Hymenoptera)

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There are many different types of ‘wasp’, many of which you may see on and around the flowers – these are just a very few examples

Vespidae *Photo © Trounce/Wikimedia Commons*

Ichneumon wasp *Photo © Hectonichus/Wikimedia Commons*

Crabonidae *Photo P Charilaou*

Chrysididae *Photo P Charilaou*

Scoliidae *Photo M Botham*

Vespidae *Photo M Botham*

FIT count category: Wasp

Hoverfly (Diptera: Syrphidae) or bee/wasp (Hymenoptera)?

A Marmalade Hoverfly
Photo © Pantelis Charilaou

large eyes covering most of the head; shorter antennae with 3 segments

Hoverflies have:
- just one pair of wings
- fast hovering flight (most species)
- no pollen basket

A hoverfly (species *Sericomyia silentis*)
Photo © Martin Harvey

FIT count category: Hoverfly

Honey Bee (family Apidae, species *Apis mellifera*)
Photo © Ken Thomas/Wikimedia Commons

eyes on sides of head, not covering it all; longer antennae with 12 or 13 segments

Bees and wasps have:
- two pairs of wings (but this can be very hard to see on live insects)
- slower flight, not hovering (except in a few species)
- female bees have a pollen basket

A social wasp (family Vespidae, genus *Vespula*)
Photo © Trounce/Wikimedia Commons

FIT count categories: Honey bee / Bumblebee / Solitary bee / Wasp

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Pollinator Monitoring Scheme Kýpros: FIT Count

Recognising hoverflies (Diptera: Syrphidae)

A hoverfly Photo © Janet Graham / CC

Hoverflies are:

- usually shiny or reflective (not always)
- usually black with yellow or other pale markings on the body and/or legs (not always)
- have veins parallel to the trailing edge of the wing, forming a 'false margin'
- have a "vena spuria" in the middle of the wing (hard to see in the field)
- are not obviously bristly

antennae usually short - some have longer antennae but still shorter than most bees, and with fewer segments

A hoverfly Photo © Martin Harvey

'vena spuria'

'false margin' veins

FIT count category: Hoverfly

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Hoverfly examples (Diptera: Syrphidae)

There are many species of hoverfly with a range of shapes and patterns

Photos © Martin Harvey

(CC photo via Pexels)

Photo © Martin Cooper/Flickr CC; © Martin Harvey

Photo © Martin Cooper/Flickr CC

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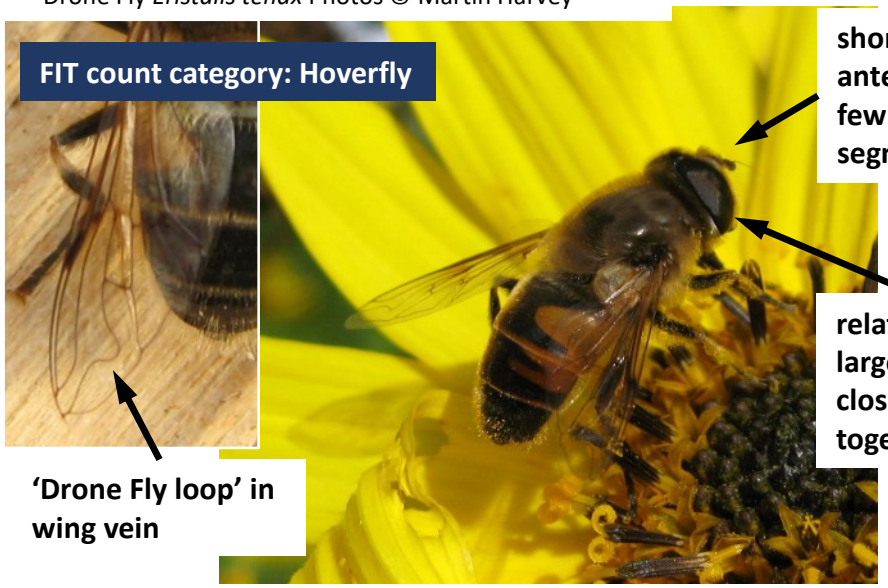
FIT count category: Hoverfly

Hoverflies (Diptera: Syrphidae) mimicking bees (Hymenoptera)

Some hoverflies are very good bee mimics

Drone Fly *Eristalis tenax* Photos © Martin Harvey



FIT count category: Hoverfly

shorter antennae, few segments

relatively large eyes, closer together

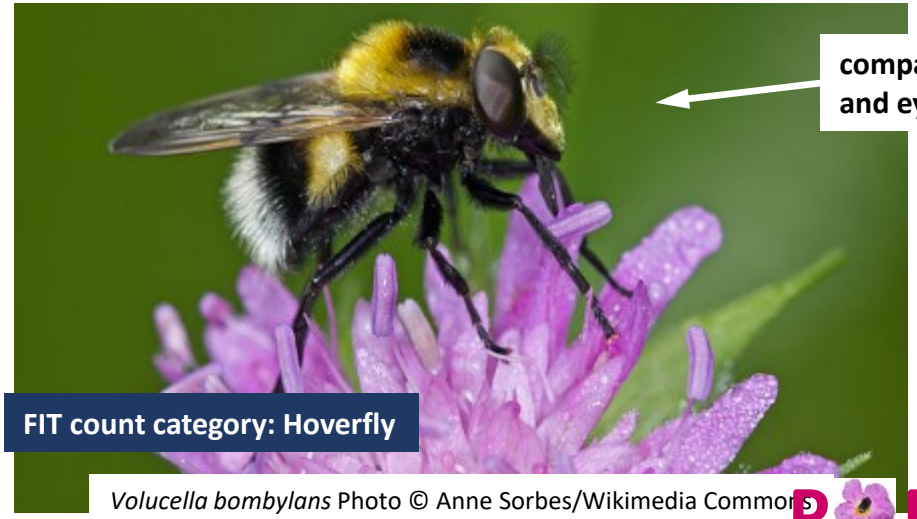
'Drone Fly loop' in wing vein

Honey Bee *Apis mellifera* Photo © Ken Thomas/Wikimedia Commons

longer antennae, 12 or 13 segments

relatively small eyes, wider apart

FIT count category: Honey bee



compare antennae and eyes

FIT count category: Hoverfly

Volucella bombylans Photo © Anne Sorbes/Wikimedia Commons

FIT count category: Bumblebee

Bombus terrestris Photo © Martin Harvey

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Other flies (Diptera)

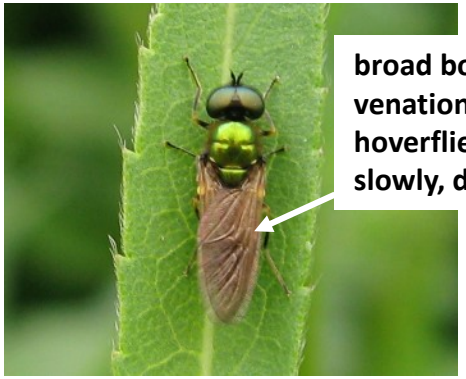
There are many other families of fly that you may see – all you need to do is separate hoverflies from the rest!

Empid fly (Empididae) *Photo © James K. Lindsey/Wikimedia Commons*

Greenbottle fly (Calliphoridae) *Photo © Juan Emilio/Wikimedia Commons*

Cranefly (Tipulidae) *Photo P Charilaou*

Beefly (Bombyliidae) *Photo M Philippou*



broad body, wing venation different from hoverflies, moves slowly, doesn't hover

Soldierfly *Photo © Martin Harvey*

Sand Fly (Ceratopogonidae) *Photo P Charilaou*

Dung-fly (Scathophagidae) *Photo © Olaf Leillinger/Wikimedia Commons*

FIT count category: Other fly

Tachinid fly (Tachnidae) *Photo © Luc Viatour/Wikimedia Commons*

Small insects

There are a number of very small (3mm or less) insects that may occur on flowers, including pollen beetles, which can be very abundant. Please provide an estimate of how many small insects you see in total on the target flower, but there is no need to identify the group (so DO NOT count pollen beetles in the “Beetles” category)

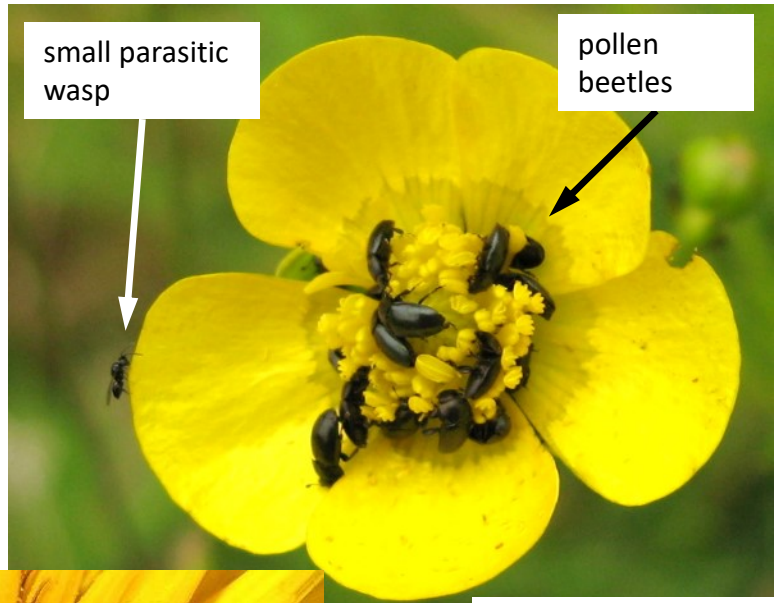


Photo © Martin Harvey

Photo © Alvesgaspar/Wikimedia Commons

FIT count category: Small insects

This is a small solitary bee, but all bees are bigger than 3mm and should be counted as bees! (This one has collected pollen on its hind legs, which is a good clue that it is a bee.)

Photo © Martin Harvey

FIT count category: Solitary bee

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Beetle (Coleoptera) or true bug (Hemiptera: Heteroptera)?

A chafer beetle (family Scarabidae)

Photo © Pantelis Charilaou

beetles have chewing mouthparts with jaws (mandibles), not a rostrum

hard wing cases (elytra), often shiny

wing cases join with a straight line down middle of insect

Shieldbug (family Pentatomidae)

wings are part hard or leathery, and part clear membrane

wings and scutellum form an X shape on back

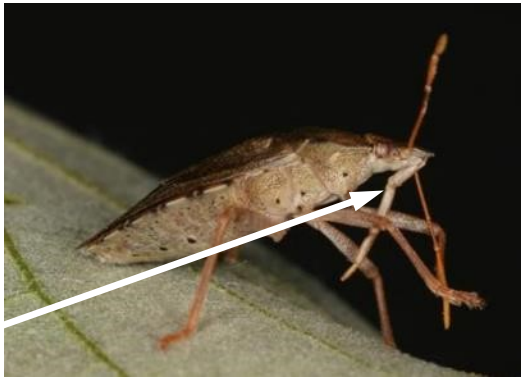

Photo © Wolfgang Rabitsch

bugs have a long, narrow rostrum, usually held pointing back under the head

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FIT count category: Beetle

FIT count category: Other known

Examples of beetles (Coleoptera)

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Beetles are extremely diverse and you may see many different types on and around the flowers including some very small species – these are just a very few examples

Melyridae *Photo M Botham*

Cerambycidae *Photo P Charilaou*

Chrysomelidae *Photo M Philippou*

Various beetles clustered in a thistle flower *Photo M Botham*

Cerambycidae *Photo M Botham*

Curculionidae *Photo M Botham*

Coccinellidae *Photo M Botham*

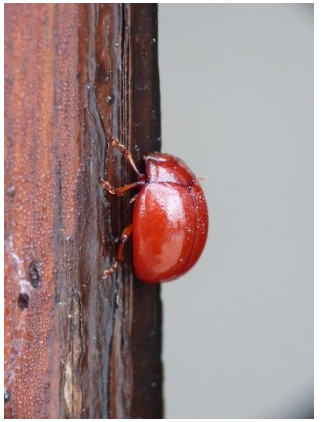
Bupestridae *Photo M Botham*

Scarabaeidae *Photo M Botham*

Carabidae *Photo M Botham*

Bupestridae *Photo M Botham*

FIT count category: Beetle



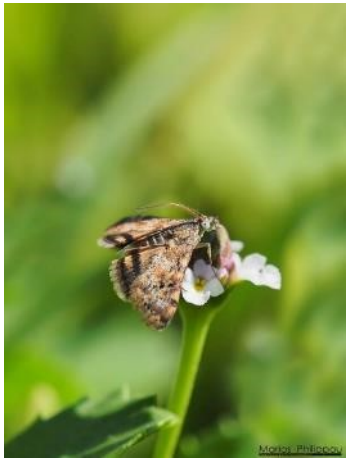
Chrysomelidae *Photo M Botham*

Pollinator Monitoring Scheme: FIT Count

Examples of butterflies and moths (Lepidoptera)

Lulworth Skipper butterfly (*Thymelicus acteon*) *Photo M Philippou*

Silver-striped Hawk-moth (*Hippotion celerio*) *Photo M Philippou*



Pyralid moth (Aporodes floralis) *Photo M Philippou*

Swallowtail butterfly (*Papilio machaon*) *Photo M Philippou*

Ni Moth (*Trichoplusia ni*) *Photo M Botham*

Pale Shoulder moth (Acontia lucida) *Photo M Philippou*

Cyprus Meadow Brown butterfly (*Maniola cypricola*) *Photo M Botham*

Painted Lady butterfly (*Vanessa cardui*) *Photo M Philippou*

Yellow Shell moth (*Camptogramma bilineata*) *Photo M Botham*

FIT count category: Butterflies and Moths

Pollinator Monitoring Scheme: FIT Count

Example of other insects

There are many other types of insect which you may see on and around flowers. If you know what group they are they can be entered into the 'Other known' category where you should also add what type you have counted each time. Below are some examples of just a few of the insect groups you may encounter

Orthoptera *Photo P Charilaou*

Dermaptera *Photo M Philippou*

Mantodea *Photo P Charilaou*

Hemiptera *Photo M Philippou*

Odonata *Photo P Charilaou*

Orthoptera *Photo P Charilaou*

Neuroptera *Photo P Charilaou*

Hemiptera *Photo P Charilaou*

FIT count category: Other known

Hemiptera *Photo M Philippou*