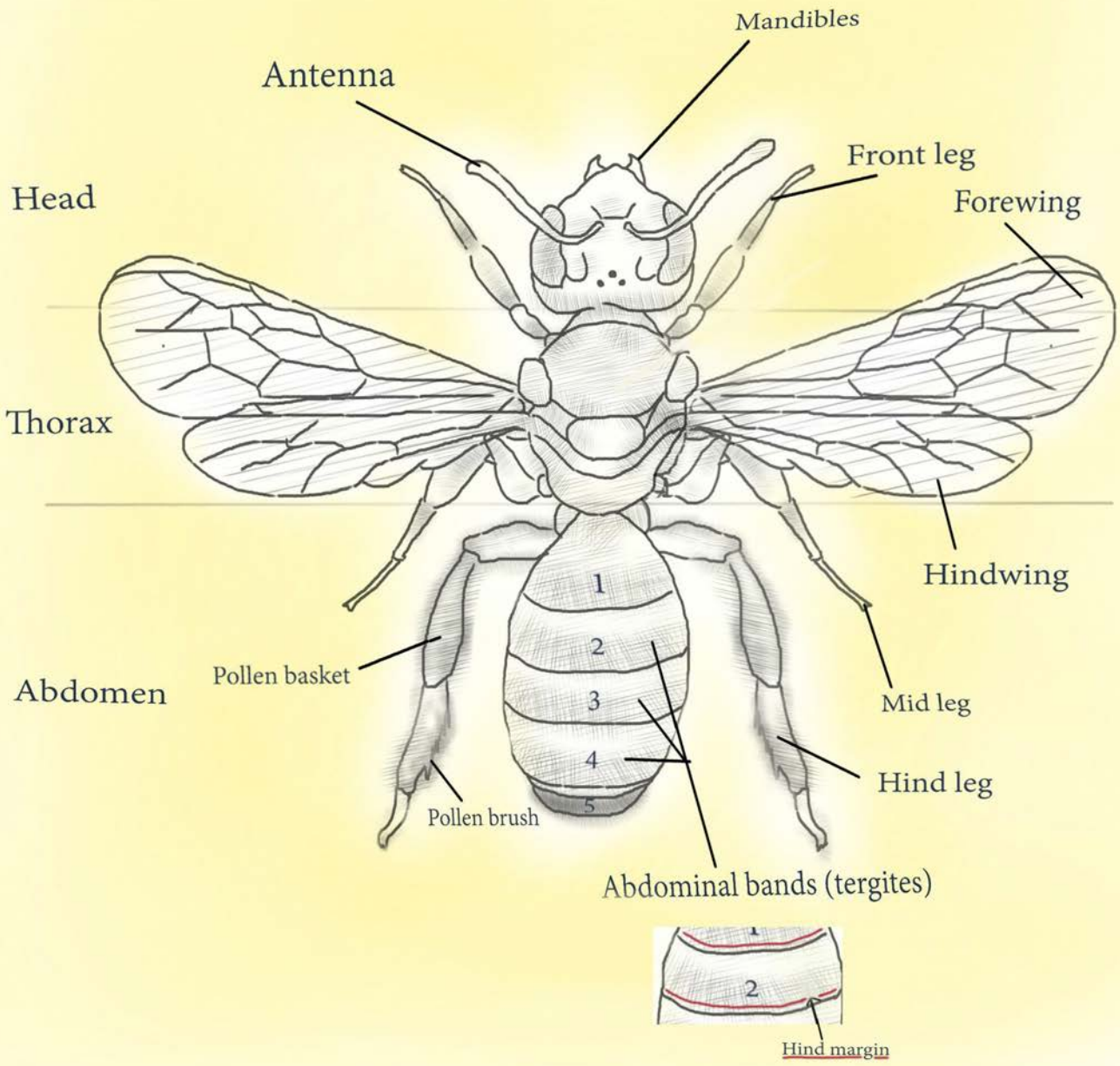
BEESPOKE

Benefitting **E**cosystems through **E**valuation of food **S**upplies for **P**ollination to **O**pen up **K**nowledge for **E**nd users

Solitary bees of the United Kingdom

By Jayna Connelly and John Holland



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Eucera longicornis © Will George

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Coelioxys conoidea © Will George

Ivy bee © Peter Thompson

Flower strip in an orchard. © Celine Silva

SOLITARY BEES

Solitary bees mostly nest and work alone in contrast to bumblebees that serve a queen as part of a colony. Some are often found nesting in what could appear to be loose colonies (aggregations) but only selected solitary species have evolved true social behaviour similar to bumblebees and honeybees. They do not produce honey or wax.

Females build a nest alone in hollow stalks and tubular holes in soil, mortar or wood. They plug eggs inside individual cells using mud, leaves or hairs before leaving their young to mature by themselves. The larvae hatch in spring after hibernating in cocoons for around 11 months. Once emerged they only survive for a further 4-6 weeks, just enough time for males to mate with females and females to then nest.

Solitary bees are not aggressive or territorial. They tend to be smaller than bumblebees and rarely sting, often getting confused with other insects such as winged ants or flies.

Some solitary bee species are **cuckoo species** (lays eggs in other bees' nests) these are often referred to as **cleptoparasites** (they steal food from other bee species). Parasites consume their host. Other solitary bees can be all of these categories e.g. *Nomada* (Nomad) bees.

CROP POLLINATION BY SOLITARY BEES

Solitary bees are important pollinators of some crops and can even be more efficient pollinators than honeybees. This is partly due to their ability to stay active in colder temperatures and so it is claimed that one Red Mason bee can provide 120 times more pollination services than honeybees. In apples more than 50% of pollination can be by solitary bees.

TABLE 1

Crops pollinated by solitary bees and key families.

CROP	IMPORTANCE	KEY TAXA
Apples	HIGH	*Andrena, Osmia*
Pears	MEDIUM	*Andrena*
Plums	MEDIUM	*Osmia, Anthophora, Nomada, Lasioglossum*
Cherries	HIGH	*Osmia*
Strawberries	HIGH	*Andrena, Nomada, Lasioglossum*
Raspberries	HIGH	*Andrena, Lasioglossum, Megachile, Osmia*
Blackberries	MEDIUM	*Andrena, Osmia, Lasioglossum, Halictus, Megachile, Nomada*
Blueberries	HIGH	*Andrena, Halictus*
Oilseed rape	LOW	*Andrena, Lassioglossum, Nomada, Anthophora plumipes, Osmia bicornis, Halictus*

IS IT A BEE?

Wasps, bees, parasitic wasps, ants are all part of the order *Hymenoptera* and all possess a 'wasp-waist'. Wasps and bees also possess two pairs of wings. This is in contrast to flies which only have one pair of wings.

Sawflies (*Symphyta*) also have two pairs of wings however they do not have the skinny 'wasp-waist' of bees.

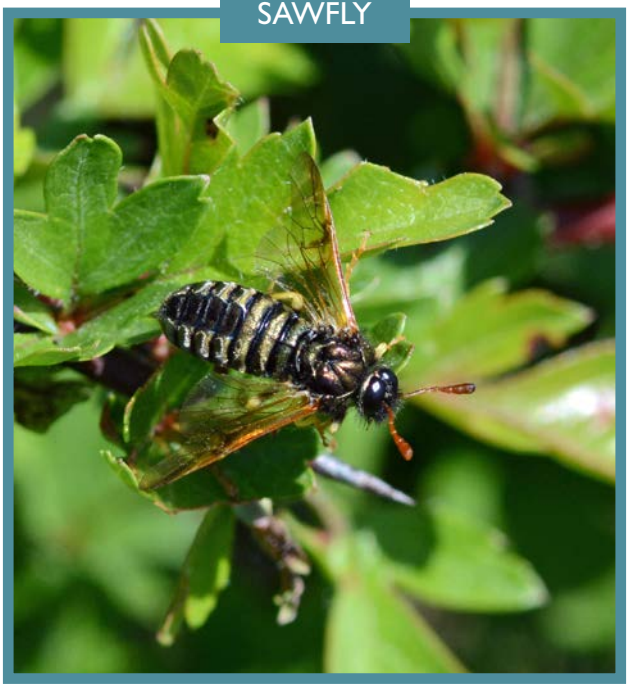
Hoverflies (*Syrphidae*) can be confused with bees due to their varying 'wasp-like' colourations but these (like all flies) only have one pair of wings. You can also often see their 'halteres' on closer inspection – little projections just behind the wings which help with balance while flying.

Some groups can be identified from their behaviour. For example, bees tend to dart from flower to flower, wasps will sit and wait for their prey to pass by and hoverflies... hover.

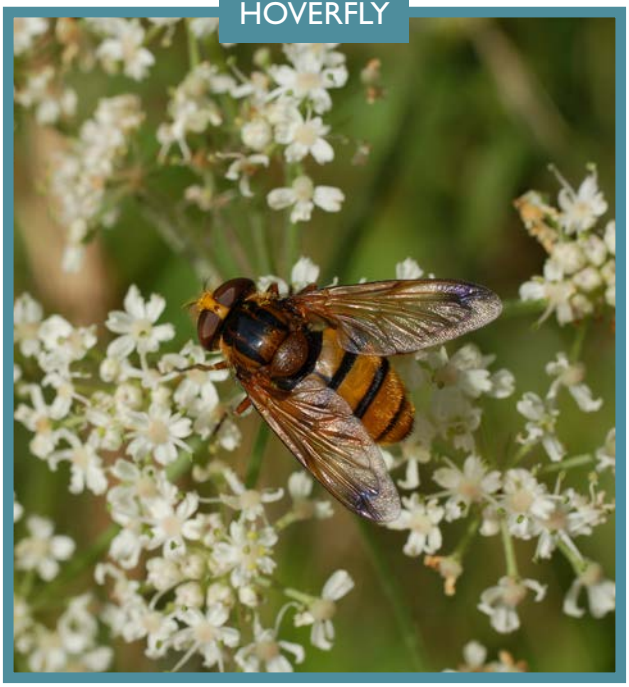
Bee-flies (*Bombylius spp.*) can be confused with bees due to their often fuzzy, bumblebee-like appearance. They are parasitic and can be seen hovering around open solitary bee nests where they flick their eggs into the tube's opening.

WASP

SAWFLY



HOVERFLY



BEE-FLY

All images © Peter Thompson

FAMILY *HALICTIDAE* – SWEAT BEES

HALICTUS – END-BANDED FURROW BEES
(pollinates blackberries and blueberries)

- There are only seven species believed to currently inhabit the British Isles, although two of these have only been found in the Channel Islands.
- Solitary but some basic signs of eusocial species.
- Usually nest in vertical earth faces.
- Mostly dark but can be metallic.
- Abdominal hair bands usually located along the hind margins of abdominal bands.
- They vary from small to a marginally greater than honeybee size.
- Some species have a particularly big, 'boxy' head e.g. *H. maculatus*.
- Pollen brushes on their back legs and sometimes under the abdomen collect the pollen.

HALICTUS RUBICUNDUS – ORANGE-LEGGED FURROW BEE

- Widespread and locally common in Britain and Ireland.
  - Use a variety of flowery habitats.
- Females fly March to October, males mid-June to October.
- Females' yellow/orange hind legs and ginger thoracic hairs make them easy to distinguish from other medium *Halictus* species.
  - Can be confused with *Lasioglossum xanthopus* but white hair bands are located along hind margins (*L. xanthopus* hair located at the base of the abdominal bands).
- Males have long antennae and so can be confused with *H. eurgnathus* but have a more vibrant brown thoracic pile and black antennae.
  - Identification especially hard when sun bleached individuals appear greyer.

Halictus rubicundus © Steven Falk

HALICTUS TUMULORUM – BRONZE FURROW BEE

- Commonly inhabit a range of open habitats across most of lowland England and Wales.
  - Less frequent in northern areas of the UK.
- Females fly from mid-March to October, males from late June/early July.
- Most frequent of the three small, metallic *Halictus* found in the UK but hard to separate from *H. confusus*.
- Females (4.5–5.5mm) have pale abdominal hair bands, and band three narrows towards the centre (unlike *H. confusus*).
- Males (4–5.5mm) do not have these clear hair bands but do have very long antennae.
- Cannot be easily distinguished from *H. confusus* in the field but generally more frequent.

Halictus tumulorum © Steven Falk

LASIOGLOSSUM – BASE-BANDED FURROW BEES
(pollinates spring blossoming fruit trees, blackberries, raspberries, strawberries and oilseed rape)

- 33 species still believed to be present in Britain but two are only found in the Channel Islands.
- Mostly solitary but some are eusocial.
- Nest in areas of light soils.
- Black with light abdominal hair bands located basally, often shiny first abdominal section.
- Varying size from very small to just under honeybee size.

Lasioglossum is host to some *Spechodes* bee species.

LASIOGLOSSUM CALCEATUM – COMMON FURROW BEE

- Present across Britain and Ireland and frequent in most areas aside from very exposed uplands.
- Females fly March to October, workers towards the beginning of summer. Males and second generation females emerge in July and are the last solitaries to go in October.
- Medium bee (5.5–7mm) similar to smaller *L. albipes* and often occurring at the same time. Size does vary (larger females are likely queens).
- Females have light brown/straw coloured thoracic hairs and a slightly barer but banded abdomen.
- Males have black or red-marked abdomen with more dense patches of hair than in *L. albipes*.

Lasioglossum calceatum © Steven falk

SPHECODES – BLOOD BEES

(pollinates spring blossoming fruit trees and oilseed rape)

- 17 species in the British Isles (*S. marginatus* only in the Channel Islands).
- Small to medium bees – difficult to tell apart in the field.
- Discreetly haired, abdomen tends to be mostly red with black.
- *Sphecodes ephippius* and *Sphecodes monilicornis*, both fairly widespread and common in southern Britain.
- These bees are cleptoparsites of *Halictus*, *Lasioglossum* and *Andrena* bees.
- ***Sphecodes monilicornis:***
  - Medium-large, 'boxy' head and slimmer build.
  - Females (6.5–7.5mm) appear late March to mid-September.
  - Males (5–6.5mm) fly July to September.
- ***Sphecodes ephippiu:***
  - Females (4.5–6.5mm) active mid-April to late September.
  - Males (4.5–5.5mm) active July to October.

Sphecodes monilicornis © Nigel Jones

FAMILY *ANDRENIDAE* – GROUND-NESTING BEES

ANDRENA SPP. – MINING BEES

(pollinates apples, pears, plums, strawberries, blueberries, blackberries, raspberries and oilseed rape)

- 69 species (including the Channel Islands).
- Varying levels of solitary – eusocial behaviour, some aggregations amount to thousands of nests in one area.
- Usually nests in light soils.
- Vary widely in size (5–17mm) colour, markings and hairiness.
- Most are black with grey-black or yellow-orange hairs although some do have red abdomens.
- Has specialised pollen-collecting hairs on the hind legs and sometimes the sides of the thorax towards their 'waist'.

ANDRENA BICOLOR – GWYNNE'S MINING BEE

- One of the UK's most frequent mining bees in lower lying areas of Britain and Ireland.
- Bivoltine, spring brood March to early June, smaller second generation mid-June to late August.
- Females (6–8mm) have red-brown thoracic pile, black face and fuzzy, yellowish haired bands on the bottom margins of abdominal bands 1–3.
    - Hind legs are dark and some distinctly orange hairs.
    - Can be confused with *A. angustior* – never has black hairs on top half of legs or sides of thorax like *A. bicolor*.
- Males (6–7.5mm) black/dull haired – sometimes partly brown-haired face.

Andrena bicolor © Will George

ANDRENA NITIDA – GREY-PATCHED MINING BEE

- One of the commonest mining bees in southern England. Nests in flat or sloping turf.
- Univoltine, flies late March to mid-July.
- Females (9.5–12.5mm) have reddish thorax and shiny black abdomen.
    - White/grey hairs on sides of tergites 1–3, face usually white haired.
- Males (8.5–10mm) tends to have more distinctly white-haired face.
    - Orangish thoracic pile, abdomen black and punctuated, sparse white-haired bands on tergites 2–3.
- Black/whiteishness varies (especially in females).

Andrena nitida © Jayna Connelly

ANDRENA HAEMORRHOA – EARLY MINING BEE

- Frequent throughout Britain and Ireland.
    - Common in agricultural areas– tolerates reasonably heavy clays.
- Univoltine, appear towards the end of March to July.
- Females (8–10mm) white facial hairs and short, uniform, reddish thoracic hairs.
    - Black, unbanded abdomen with orange hairs at the tip.
- Males (7–9.5mm) smaller and less distinctive – duller and buff haired.
    - Pollen brushes on hind legs are bright yellow.

Andrena haemorrhoa © Gail Hampshire

ANDRENA FLAVIPES – YELLOW-LEGGED MINING BEE

- Widespread, common in southern England, also in Midlands and north Wales. It is increasing in range and abundance.
- Often nest in aggregations.
- Habitat varies: soft rock cliffs, chalk downland, abandoned quarries and brownfield sites.
- Bivoltine, spring generation flies March to June, summer generation flies mid-June to September.
- Medium pale brown bees. Brown hairs on thorax.
- Broad whitish abdominal bands 2–4, facial hairs similar colour.
- Orangish, haired pollen brushes on females.
- Males tend to be browner, slimmer, have longer antennae and lack pollen brushes on hind legs.

Andrena flavipes © Nigel Jones

ANDRENA DORSATA – SHORT-FRINGED MINING BEE

- One of the commonest *Andrena* species in southern England.
- Rare in Wales.
- Habitat varies: heath, brownfield sites, sand dunes, softer rocky cliffs as well as cliff-top grassland and farmland.
- Nests in sparingly vegetated, light soils.
- Bivoltine, first generation flies March to May, second generation July to September.
- Medium sized bees.
- Broad hind legs.
- Short rusty thoracic hairs.
- Yellow hairs on sides of face.
- Distinct pale hairs on abdominal bands 2–4 (on 2 and 3 they have a break in the middle).
- Males lack pollen collecting hairs and have dark hind leg hairs.

Andrena dorsata © Steven Falk

ANDRENA CINERARIA – ASHY MINING BEE

- Common in most of England and Wales, less frequent in Scotland.
- Found in a variety of habitats including farmland. Often found nesting in aggregations.
- Univoltine, fly end of March-June, some evidence of attempts of a second brood later on.
- Very distinctive UK solitary bee – black and ashy grey.
- Females (10–11mm) have black shiny abdomen and two grey bands at either end of the thorax.
- Males (9–10mm) similar to females but smaller and less noticeable.
    - Have light hairs on the side of the thorax and top of the abdomen.

Andrena cineraria © Peter Thompson

Andrena fulva © Will George

ANDRENA FULVA – TAWNY MINING BEE

- Common in most south Britain.
- Can nest in large aggregations causing volcano-like soil heaps.
- Often inhabit garden lawns in built-up areas.
- Fly March to mid-June.
- Females look quite bulky and have bright red thorax and orange abdomen, legs and underside are black-haired.
- Males smaller, scrawnier and buff with white moustaches and long mandibles.

Andrena haemorrhoa © Konstantinos Tsioliss

FAMILY *APIDAE*

MELECTA – MOURNING BEES

- Medium, stocky, extensively black-haired bees with gently pointed abdomen.
- They often have some grey or white hairs and can have spots.
- Possesses a pair of blunt spines between the thorax and the abdomen.
- Cleptoparasites of *Anthophora* bees.
- Two species recorded in Britain, but one is likely extinct (*Melecta luctuosa*).

MELECTA ALBIFRONS – COMMON MOURNING BEE

- Widespread across south but not common.
- Flight season from April until June.
- Large (10–11.5mm) with distinctive grey band on its thorax near its head/'neck' and white abdominal roundish spots.
- Hairy with chunky thorax and abdomen.
- Sexes difficult to distinguish.

Melecta albifrons © Nigel Jones

EUCERA – LONG-HORNED BEES

(pollinates legumes, bee orchids and fodder crops in other countries)

- Mostly found along southern England and Wales coastline and few scattered inland sites north to Shropshire.
- Solitary, but often nests in aggregations.
- Male has very long antennae.
- Clypeus ('nose') sticks out.
- Abdominal stripes are continuous circles around the abdomen.
- Medium-large bees but only one likely to be found in the UK, ***Eucera longicornis:***
  - Flies late May to mid-July.
  - Females can be confused with *Anthophora* species.

Eucera longicornis © Ivar Leidus

CERATINA – SMALL CARPENTER BEES

- This is a globally widespread, large genus of small-medium bees.
- Nests in dead wood and hollow stems, a few cases of eusociality.
- Mostly quite slimly built, sparsely haired and weakly metallic.
- Males usually have partly yellow/off-white faces.
- Only one UK species, **Little Blue Carptener bee, *Ceratina cyanea*:**
  - Flies May to mid-September.
  - Widespread in south-east England.
  - Small (4.5–5mm).
  - Metallic blue which can be confused with some *Lasioglossum* species but these do not have an abdomen which gets wider towards the tail-end.

Ceratina cyanea © Steven Falk

ANTHOPHORA – FLOWER BEES
(pollinate plums and oilseed rape)

- Five British species.
- Chunky, almost bumblebee like.
- Carry pollen on back legs.
- Often strong sexual dimorphism, males tend to have partly yellow or white face.
    - *A. furcata* is one example where the sexes do look quite similar.
- Nests in cliffs, walls and sometimes wood.

ANTHOPHORA PLUMIPES – HAIRY FOOTED FLOWER BEE

- Common in most parts of southern England.
- Males can be seen as early as late February and they continue into May.
- Females fly two to three weeks after and usually persist until June but can stretch into July.
- 10–11mm – the largest *Anthophora*.
- Difficult to distinguish from much rarer *A. retusa*.
- Males are buff coloured and black-haired towards tip of the abdomen.

Anthophora plumipes © Will George

EPEOLUS – VARIEGATED CUCKOO BEES

- Medium-sized stocky bees, discreetly haired but boldly patterned.
- All species are cleptoparasites of *Colletes* bees.
    - Only two UK species but almost impossible to confidently distinguish in the field, female leg colour is helpful. Both fly June to September.
- *Epeolus cruciger* – Red-thighed *Epeolus:*
    - Reddish hind legs.
- *Epeolus variegatus* – Black-thighed *Epeolus*
    - Black hind legs.

NOMADA – NOMAD BEES
(pollinates plums, strawberries, blackberries, other spring blossoming fruit trees and oilseed rape)

- 33 species in Britain and four more in the Channel Islands.
- Generally, sparsely hairy but vary considerably in size.
- Yellow and black, red or brown banded abdomen (although sometimes can look more orange) or all red abdomen.
- Females often hairier on their fifth tergite towards tip of their abdomen than males.
- Smaller species can be confused with *Sphecodes* species, but red antennal markings help distinguish them.
- Mostly cleptoparasites of *Andrena* species but also sometimes *Melitta*, *Lasioglossum*, *Panurgus*, *Eucera* as well as some non-British genera.

NOMADA PANZERI – PANZER'S NOMAD

- Found throughout Britain, more common in wooded areas than *N. flava* – clectoparasitic.
- Univoltine, fly end of March to late June.
- Very difficult to separate from *N. flava*, *N. ruficornis* is also superficially similar without microscope.
- Females are small, relatively dark with less yellow abdominal markings than *N. flava*.
    - Often to look more purplish in the field compared to *N. flava*.
- Males (6–8mm) usually deemed indistinguishable from *N. flava* males.

Nomada panzeri © Steven Falk

NOMADA RUFICORNIS – FORK-JAWED NOMAD

- Common throughout much of southern Britain – clectoparasitic.
- Univoltine, active April to June (can be July).
- Medium, tricolored bee but extent of markings can vary.
    - Not easily separated from *N. panzer* or *N. flava* in field, microscope allows for observation of distantly shaped mandibles.
- Females (7–8mm) longer thoracic hairs than *N. panzeri*, less yellow markings than *N. flava*.
- Males (6.5–8mm) significantly hairier than *N. flava* and *N. panzer*.

Nomada ruficornis © Steven Falk

NOMADA GOODENIANA – GOODEN'S NOMAD

- Very common UK Nomad – clectoparasitic.
- Usually univoltine – fly April to June.
    - Occasionally bivoltine in those specialised for *Andrena thoracica*.
- Large with black and yellow bands complete on abdominal bands, 2–5 and sometimes 1.
- Females (7.5–10mm) with red antennae and legs and two yellow spots at base of thorax, wings and collar.
- Males (7.5–8.5mm) similar but blacker antennae and yellower face.
- *N. marshamella* is similar but first yellow abdominal band is faint or absent and second is split.

Nomada goodeniana © Peter Thompson

NOMADA FABRICANA – FABRICIUS' NOMAD

- Widespread and locally common in southern Britain – scarcer north – clectoparasitic.
- Bivoltine – first generation active March to June and second generation fly June to August.
- Small-medium: females 5.5–8mm / males 5–7mm.
- Mostly red bee with small yellow spots on abdominal bands 2 and 3, black face and thorax.
- Females have orange/red antennal segments 4–7 and 12.
    - Some darker females can lack yellow spots and/or red antennal markings.

NOMADA FLAVOGUTTATA – LITTLE NOMAD

- Widespread, frequent over much of southern England, scarcer in the rest of Britain – clectoparasitic.
- Mostly bivoltine but some univoltine – first generation fly late March to June, the second end of June to September.
- Females, two red spots on thorax as well as red side margins, large red patches on sides of thorax (can be divided in two). Thorax is black nearest abdomen with silvery hairs on sides. Red face, antennae are orange on underside but brownish on top.
- *N. conjungens:*
    - Similar but bigger, slimmer and no silvery hairs.
- Males have darker thorax, antennae, legs and abdominal bands 1–3.
- Some variation in size, extent of red, black and yellow.
- Some lack yellow spots, others have additional markings.
- *N. castellana*, *N. sheppardana* and *N. fabriciana* hard to distinguish in the field.

Nomada flavoguttata © Steven Falk

NOMADA RUFIPES – BLACK-HORNED NOMAD

- Frequent in southern heathland areas of England and Wales, scarcer north – clectoparasitic.
- Univoltine, fly July to September.
- Only small-medium (5–7mm) nomad with combination of one yellow spot on thorax and entirely almost black antenna.
- Abdomen tricolored but extent can vary.
- Yellow spots on abdominal bands 2 and 3 are separate and triangular.
- Female more orange characteristics, particularly legs and partially black femora (males more yellow).
- *N. errans* similar but paler antennae and body markings, and abdominal band 4 mostly black.
- *N. fucata* also similar but have orange antennae.

Nomada rufipes © Will George

Wild bee seed mix © Rachel Nicholls at University of Sussex

FAMILY *COLLETIDAE*

COLLETES – PLASTERER BEES

- Nine species in Britain.
- *C. hederae* has colonised Britain more recently.
- Solitary, nests in light soils and some species do this in large aggregations.
- Medium, yellow-brown haired, distinctive looking genus of bees.
- Collects large amounts of pollen using brushes on hind legs and partly on thorax.
- *C. cunicularis* is the only species of this genus which lacks a banded abdomen.

Colletes daviesanus © Donald Hobern

COLLETES DAVIESANUS – DAVIES' COLLETES

- Most widespread Colletes in UK, less strongly linked to sandy habitats than other species in this genus.
- Common in arable farmland and gardens across most of England.
  - Rarer in Scotland and Wales.
- Active towards the end of May until early September.
- Easily distinguished from all other species (by their shiny yet hairy first abdominal band) except for *C. floralis* which has thinner, ashier abdominal hair bands.
- Females: 6.5–7mm.
- Males: 5.5–6.5mm.

Colletes similis © Steven Falk

COLLETES SIMILIS – BARE-SADDLED COLLETES

- Can be found throughout southern England but still quite restricted in range and frequency.
- Nests in small aggregations.
- Uses a range of habitats along coasts, heathland, chalk grassland and sometimes brownfield sites.
- Fly mid-June to beginning of September.
- Females (6–7mm) are easily confused with *C. fodiens* but has rusty-red-brown thoracic hairs (rather than orange-brown).
  - Abdominal band 1 is bare and face is sparsely haired.
  - Can be harder to separate when individuals are worn and aged.
- Males (5.5–7mm) cannot be separated from *C. fodiens* in field.

HYLAEUS – YELLOW-FACED BEES

- 12 species present in Britain can be difficult to distinguish in the field.
- Nests in hollow stems and old nests and other holes in wood, walls or vertical banks.
- Small and slim, usually black with yellow or white markings and few hairs.
- Males have mostly yellow or white face.
- Females tend to just have a pair of yellow or white dots on the sides of their face.
- They lack pollen collecting hairs and instead carry pollen inside them.

HYLAEUS COMMUNIS – COMMON YELLOW-FACE BEE

- Common in areas across southern Britain, north to Cumbria and Yorkshire.
    - The most frequent *Hylaeus* to use garden bee hotels.
- Fly late May to mid-September.
- Females (4.5–5mm) have triangular facial spots and much less yellow facially than males and no white hair fringes on the sides of the hind margins of abdominal band 1.
    - *H.pectoralis* also have this but are larger and much rarer.
- Males (4–4.5mm) easily separated from all other *Hylaeus* by their facial pattern.
- Facial markings and size can vary (can be confused with *H. brevicornis* and *H. pictipes*).

Hylaeus communis male with yellower face. © Will George

Hylaeus communis © Will George

HYLAEUS HYALINATUS – HAIRY YELLOW-FACE BEE

- Widespread and particularly common in southern England, found as far north as south-west Scotland.
- Appear in May and persist until September.
- Females (4–4.5mm) have strong white markings.
    - Easily confused with *H. confusus* and *H. incongruous*.
- Males (3.5–4.5mm) easily distinguished by long facial hairs.
- Longest face of all *Hylaeus*, densely punctured sides of first abdominal band.
    - Both sexes have orange undersides to their antennae.
- Females can vary in the extent of their markings and males can exhibit worn facial hair.

HYLAEUS BREVICORNIS – SHORT-HORNED YELLOW-FACE BEE

- Widespread and common in various areas of lowland Britain.
    - Scarcer but found as far north as south-west Scotland.
    - Widespread but declining across Ireland.
- Active late May to mid-September (possibly bivoltine in southern populations).
- One of two very small (3.5–4mm) *Hylaeus* but one of the darkest with roundish face (wider in males) and short antennae.
- Females have narrow yellow facial markings (some variation in shape).
- Males have particularly dull bodies.

FAMILY *MEGACHILIDAE*

ANTHIDIUM – WOOL CARDER BEES

- Stocky, relatively large bee.
- Either yellow spots or bars on abdomen and sometimes thorax.
- Males (9.5–12mm) are larger than females often with spines at the end of the abdomen, and highly territorial.
- Females (8–10mm) gather pollen with pollen brush under the abdomen.
- Use plant hairs to build nests in a range of cavities.
- Only one British species ***Anthidium manicatum:***
    - Common in gardens within southern England, scarcer in north of Britain.
    - Fly from the end of May to end of August.

Anthidium manicatum © Phil Bendle

MEGACHILE – LEAFCUTTER BEES
(pollinates raspberries)

- There are seven British species.
- Nests in cavities in the ground or above ground in dead wood for example, depending on the species.
- Medium with large jaws for cutting leaves into round sections used in nesting.
- Pollen brush is on underside of female's abdomen.

MEGACHILE CENTUNCULARIS – PATCHWORK LEAFCUTTER BEE

- Widespread and frequent in southern Britain, range extends up to northern Scotland.
    - Present all the way to Scotland.
- Nest in dead wood and wall cavities, sometimes in loose groups.
- Fly mid-June to beginning of September.
- Medium, brownish bee with little hair on the top of their bodies.
- Females (7–8.5mm) orange pollen brush and hairy sides can be seen from above.
    - Abdominal bands 2 to 4 have narrow, white hairs along the hind margins (broken on 2 and 3).
    - Can be confused with *M. versicolor* but this has a black tip to pollen brush.
- Males (7–8mm) require magnification to distinguish from *M. versicolor*.

Megachile centuncularis © Will George

HOPLITIS – LESSER MASONS

- Three British species, one of which is long extinct.
- Very similar to *Osmia* in appearance, behaviour and range, difficult to tell apart in the field.

HOPTILIS CLAVIVENTRIS – WELTED MASON BEE

- Small, widespread across south of UK north to Cumbria, mostly in south-east.
    - Unrecorded in Scotland.
- Fly May to September, males appear first.
- Females (5–6mm) have dull appearance but creamy white pollen brush under abdomen (unique – no *Osmia* with this).
- Males (4.5–6mm) can be confused with *O. spinulosa* or maybe a small *O. bicolor*.
    - Requires magnification to distinguish between them.

OSMIA – MASON BEES

(pollinates plums, cherries, apples, raspberries and blackberries)

- 13 *Osmia* species currently in the UK.
- Mode of nesting varies; some excavate their own cavities while others use pre-existing ones.
- Medium-large bulky bees, often coloured and sometimes slightly metallic.
- Possess a pollen brush on the underside of the abdomen and not on their hind legs.
- Have box-shaped heads and powerful jaws for chewing leaves to create mastic.
- Nest in a range of cavities such as in wood, walls and hollow stems.

OSMIA BICORNIS – RED MASON BEE

- One of commonest solitary bees, often in built up areas.
- Fly March to July; males appear two weeks earlier than females.
- Females (8–10mm) have black haired head, buff thorax orangish abdomen and have incurved 'horns' on face.
- Males (6–8mm) are smaller with longer antennae and whitish facial hairs, reddish-orange abdominal hairs.
- This is a particularly important pollinator of fruit trees and also pollinates OSR and is now sold commercially for this.

Osmia bicornis (female) © Will George

Osmia bicornis (male) © Ellie Jackson-Smith

Osmia caerulescens © Steven Falk

OSMIA CAERULESCENS – BLUE MASON BEE

- Found across southern Britain.
- Mostly univoltine but occasionally bivoltine, fly late April to late July, males appear first.
- Females (7–8.5mm) easily distinguishable by boxy-head, black pollen brush and blueish metallic appearance. Less hairy than other *Osmia*.
- Males (5–6mm), appear fuzzier with orange-buff hairs on its metallic body.
  - Can be confused with *O. leania* and *O. niveata* but usually smaller and more metallic.
- Parasitised by parasitic wasp *Sapyga quinquepunctata*.

Osmia leaiana © Nigel Jones

OSMIA LEAIANA – ORANGE-VENTED MASON BEE

- Found across southern Britain, recorded as far as Cumbria.
- Fly towards the beginning of May to late August.
- Females (7–8mm), very difficult to distinguish from *O. niveata* in field or even *Megachile centuncularis*.
  - Females only collect pollen from *Asteraceae*.
  - Have a particularly broad boxy-head, brownish hairs on thorax and abdomen with darkish wings and cylindrical abdomen.
- Males (6–7mm) have particularly golden thoracic hairs as well as on the hind margins of abdominal bands, also slightly metallic.
- Can be confused with very rare *O. niveata*.

STELIS – DARK BEES

- Five species in Britain, all of which are elusive and infrequent.
- Small-medium slim bees, strongly punctuate but not particularly hairy, sexes are difficult to tell apart.
- Species found in the UK are usually blackish, some with spots or narrow bands on abdomen.
- Cleptoparsasites of other *megachilid* bees.

CHELOSTOMA – SCISSOR BEES

- Smallish, slim, longish bodied bees can be confused with *Lasioglossum*.
- Nest in various pre-existing holes such as in wood and walls (*C. florisomne* particularly favours thatched roofs).
- Two UK species both widespread but restricted in pockets of southern Britain: *Chelostoma campanularum* (4–4.5mm) and *Chelostoma florisomne* (6–8mm).

Chelostoma campanularum © Lukas Large

Chelostoma florisomne © Gilles San Martin

Heriades truncorum © Will George

HERIADES – RESIN BEES

- Small, black bees with little hair, females have pollen brush under the abdomen.
- Have characteristic curved ridge across the top of abdominal band 1, rough in appearance.
- Male abdomen is relatively club shaped.

HERIADES TRUNCORUM – LARGE-HEADED RESIN BEE

- The only UK species (5–5.5mm), records are increasing in frequency and area within south-east England.
- Nests in heathland, chalk downlands and even gardens and brown field sites.
- Fly June to September.
- Only forages on yellow composites e.g. ragworts and fleabanes.
- Female is long with boxy-shaped head and thin white hair bands only the hind margins of the abdominal bands.

COELIOXYS – SHARP-TAILED BEES

- Distinctive but uncommon, six UK species present and one more in the Channel Islands.
- Medium, roughish looking bees.
- Strongly tapered abdomen and white hair patches.
  - Female's abdomen is pointier than males.
  - Males have spines on abdominal band 6, occasionally sides of 5.
- Share unique 'hairy eye' trait with *Apis bees*.
- Cleptoparasites of *Megachile* and *Anthophora* bees.

FAMILY *MELITTIDAE*

DASYPODA – PANTALOON BEES

- Mainly inhabit heathland and sandy areas of south-east England from Dorset to Norfolk.
- Largish, light-buff, hairy bees.
- Sexes look similar.
- Only British species **Pantaloon bee (*D. hirtipes*):**
  - Appears in late June and persists until early September.
  - Body length is usually around 9–13mm.
  - Females have oversized, pantaloon-like pollen brushes on their hind legs.
  - Only forage on *Asterceae* (e.g. ragwort) and can form large nesting aggregations in flat, sandy ground.

Dasypoda hirtipes © Will George

MELITTA – BLUNTHORN BEES

- Four UK species mostly located southerly.
- None in Ireland.
- Nests in light soils, forming aggregations in some instances.
- Medium with thinly banded abdomens, sometimes confused for *Andrena*.
  - Identified by blunted antennae, large final 'foot' segment, no facial depression.
  - Pollen collected on hind legs.
- Mostly dependent on very restricted plant species.

Melitta haemorrhodalis © Lukas Large

MELITTA HAEMORRHODALIS – GOLD-TAILED MELITTA

- More widespread relative to other *Melitta* but rarely common.
  - Mostly south of Chilterns but scattered, recorded extending as far north as east Lothian.
- Fly early-July to early September.
- The orange-haired abdominal tip is distinguishing feature.
- Females (8–8.5mm) darkest *Melitta*, blurred abdominal bands and mostly dark-haired thorax.
- Males (7.5–8mm) lack the strong abdominal bands of *M. leporine* and *M. tricincta*.
- Forages mainly on Camapnula's but males often roost in mallow flowers.

MACROPIS – OIL-COLLECTING BEES

- Specialised for nesting in wetlands.
- Medium, mostly black bees with light coloured hairs.
- Females have broadening hind legs.
- Males have yellow faces.
- Strong relationship with *Lysimachia* loosestrifes – provides pollen and floral oils (used for waterproofing nests).
  - Waterproof nests allow them uniquely to ground-nest in wetlands.

MACROPIS EUROPAEA – YELLOW LOOSESTRIFE BEE

- Only UK species in this family.
- Mostly recorded in south-east England from Dorset to Norfolk.
    - Inhabits wetlands and watersides with plentiful Yellow Loosestrife.
- Appear at the end of June, persist until early September.
- Body length is usually 7–8mm, wide, hairy hind legs are highly recognisable.
    - Females have large pollen brush – white on lower half and black initial sections of 'foot'.
    - Males have yellow faces, lack pollen brush but still have swollen back legs.

Macropis europaea © Dick Belgers

Dasypoda hirtipes (male) © Will George

TERMINOLOGY EXPLAINED

Aggregation – a group of bees which are nesting in the same area but not necessarily working and living in a cohesive, eusocial colony.

Univoltine – one generation per year.

Bivoltine – two generations per year.

Eusocial – colonies with a queen, workers and males.

Mandibles – mouth parts.

Stylopised – a insect which has a parasite inside it.

Clectoparasite – cuckoo bees, lay their eggs in nests of other bee species.

Please note: photos associated with descriptions are of females unless specified.

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The BEESPOKE project (Benefitting Ecosystems through Evaluation of food Supplies for Pollination to Open up Knowledge for End users) aims to increase levels of pollinators and crop pollination at local and landscape scales by providing land managers and policy makers with new expertise, tools and financial knowledge to create more sustainable and resilient agroecosystems.

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