

Pollinator Portraits 2017
Portraits de pollinisateurs 2017



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Pollinator portraits

These portraits are not of bees, but of flies – hoverflies, to be precise. Not so well known as bees, hoverflies play their own, and slightly different role in pollination. They are significant pollinators of various fruit trees and some other crops, like oil-seed rape. They also pollinate many wild flowers, including rare species not normally visited by bees. Hoverflies can be found in a very wide range of terrestrial and freshwater habitats. As larvae about a third of them feed on greenfly, other plant bugs, or small caterpillars and are recognised as helping to prevent epidemic greenfly infestations in cereal crops like winter wheat. Another equally large group of species is plant-feeding, mining leaves, stem-bases, rhizomes, tubers, bulbs or corms of herb layer plants. The rest of them grow up on a diet of bacteria, algae or other micro-organisms, usually in water or damp situations of some sort. Almost without exception, as adults they feed on nectar and pollen, visiting the flowers of a very wide range of trees, shrubs and herb layer plants, including pollen-only flowers like those of grasses, sedges, oak trees and poppies. The names of the hoverflies portrayed are given after the photos, together with brief notes on them.

Cover figure

Sphiximorpha subsessilis: this rarely-seen forest hoverfly develops as a larva in sap runs on the trunks of old trees of various sorts, especially poplar.



*Growing up underwater
Ils grandissent dans l'eau*



*Bumble bees that aren't
Les bourdons qui n'en sont pas*



Greenfly gourmands
Gourmands de pucerons



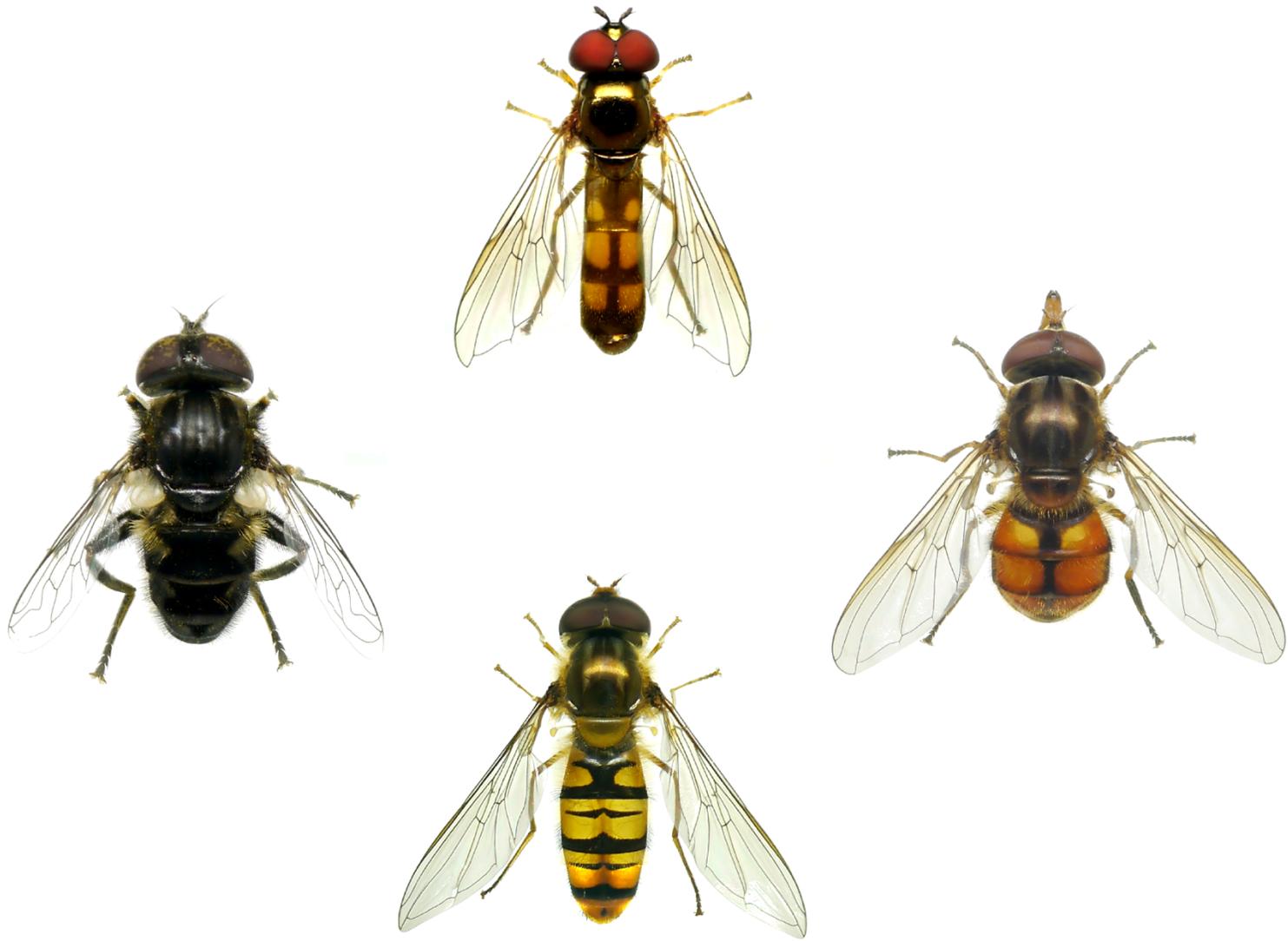
Dwellers in darkness
Des habitants du monde souterrain



Little and large
Minuscule et majuscule



Vegetarians
Des végétariens



*From the farm
De la ferme*



In the garden
Du jardin



Nearly gone
Presque perdus



Life of the dead tree
La fraternité du bois mort



Close relations
Parents proches



The deceiver
Le tricheur

Growing up underwater

*Lejogaster metallina**(top left), *Eristalis abusiva**(top right), *Riponnensia splendens**(middle), *Helophilus pendulus**(bottom left), *Sericomyia silentis**(bottom right).

Like dragonflies and mayflies, these hoverflies live below the water surface for most of their lives. Their larvae don't have gills like dragonfly nymphs, but breathe atmospheric air. Larvae of *Eristalis*, *Helophilus* and *Sericomyia* do so using a periscopic breathing tube, which is protruded through the surface film of the water. These breathing tubes can extend for more than a metre and give the larvae their common name, of "rat-tailed maggots". *Helophilus pendulus* is particularly common and widely-distributed, found in a range of habitats, including suburban gardens, where it can develop in garden ponds.

Bumble bees that aren't

Pocota personata (top), *Criorhina berberina**(bottom left), *Eristalis intricaria**(bottom right).

Bumble-bee mimics are found in at least 10 different hoverfly genera. Only one of them, *Volucella bombylans*, lives in bumble-bee nests. The others have diverse life histories. Larvae of *Pocota personata* live in water-filled tree holes, usually high on the trunk of over-mature deciduous trees. By contrast, *Criorhina* larvae live in rotting roots of living trees, or in low-level trunk cavities and holes. *Eristalis intricaria* has aquatic larvae, in organically-enriched bottom mud of shallow water bodies in open country. *Criorhina* species fly in early spring, when flower-feeding resources are scarce. They depend to a significant extent on the flowers of male willow (*Salix*) bushes.

Greenfly gourmands

*Sphaerophoria scripta**(top), *Baccha elongata**(left), *Heringia heringi**(right), *Xanthogramma pedisequum* (bottom).

Aphids and similar plant bugs are a very popular food source among syrphid larvae. While growing up a single hoverfly larva will consume several hundred greenfly. Some hoverfly species specialise greatly in where they lay their eggs, others simply using aphid colonies wherever they find them. Larvae of *Sphaerophoria scripta*, which is highly migratory, are generalists, found on ruderals and cereal crops. *Baccha elongata* lays her eggs in the vicinity of aphid colonies on shrubs, understory trees and tall herb-layer plants, in partial shade. The larvae of *Heringia heringi* are specialist predators of gall-making and leaf-curling greenfly and psyllids on fruit trees like apple, cherry and pear. *Xanthogramma* larvae specialise in feeding on root aphids farmed by ants.

Dwellers in darkness

Eumerus ovatus (top left), *Eumerus tarsalis* (top right), *Eumerus olivaceus* (bottom left), *Eumerus ornatus* (bottom right).

Nearly all known *Eumerus* larvae live underground, in rotting bulbs, tubers or rhizomes. Geophytes are diverse in the Mediterranean zone, and so is the genus *Eumerus*. The zig-zag flight of *E. ovatus* is impossible to follow, because the eye is inevitably drawn to the iridescent, silvery haired abdomen when it catches the sun, only to disappear when the insect changes direction.

Little and large

Milesia crabroniformis (left), *Paragus haemorrhous**(right).

Milesia crabroniformis is the largest European hoverfly, up to 25 mm long. *Paragus haemorrhous* is one of the smallest, and can be no longer than 3.5mm.

Larvae of the tiny *Paragus haemorrhous* predate aphids in crops of artichoke and fava beans in Mediterranean parts of Europe and take only a few weeks to complete their life cycle. By contrast, larvae of *Milesia crabroniformis* live in rotting wood in the trunk-base cavities of old oaks and take more than 1 year to develop. *Milesia* flies late in the year and is one of the hoverflies that characteristically visit ivy (*Hedera*) flowers, often in the company of the European hornet (*Vespa crabro*) which it mimics in both behaviour and appearance.

Vegetarians

Merodon avidus (top), *Cheilosia orthotricha* (left), *Portevinia maculata**(right).

Merodon avidus larvae mine the bulbs of small lillies of the genus *Ornithogalum*. Those of *Cheilosia orthotricha* mine the bases of flowering stems of the tall, streamside herb *Petasites hybridus*, while *Portevinia maculata* larvae mine the corms of bear garlic, *Allium ursinum*. Adults of *P. maculata* are to be seen resting on the leaves of their host plant, or visiting its flowers – they have rarely been seen visiting the flowers of other plants and play a part in pollination of *A. ursinum*.

From the farm

*Melanostoma mellinum**(top), *Eristalinus sepulchralis**(left), *Rhingia campestris**(right), *Episyrphus balteatus**(bottom).

Melanostoma mellinum is one of the few syrphids which maintains populations in silage grassland. It also occurs in hay meadow and pasture. The adults are specialists in feeding on pollen-only flowers, particularly those of grasses. It has been found that they are pollinators of plantains (*Plantago*). *Eristalinus sepulchralis* larvae develop in water grossly polluted by animal waste and in manure heaps. The larva of *Rhingia campestris* is an inhabitant of cow dung. The adult fly has extremely long mouthparts enabling *Rhingia* to feed at many of the flowers with long corollas normally avoided by syrphids. *Episyrphus balteatus* has aphid-feeding larvae and can build up massive populations in cereal crops, where it is regarded as significant in aphid control. It is, in addition, characteristically found on bush crops like black-currant. Females of *E. balteatus* overwinter in central and Atlantic parts of Europe, hibernating in such places as trusses of ivy. They are among the first hoverflies to appear as winter wanes.

In the garden

*Syrirta pipiens**(top), *Syrphus ribesii**(left), *Merodon equestris**(right).

Larvae of *Syrirta pipiens* are found in compost heaps and other humid accumulations of vegetable debris and can in consequence be abundant in suburban gardens. Rose bushes, current bushes and various tall herbs are where the aphid-feeding larvae of *Syrphus ribesii* are found. *Merodon equestris* has spread to many parts of Europe where daffodils have been introduced to gardens and parks, its larvae feeding in their bulbs, achieving notoriety for itself as “the bulb fly”.

Nearly gone

Psarus abdominalis (left), *Sphiximorpha petronillae* (right).

Psarus is the only genus in the Tribe Psarini and *Psarus abdominalis*, its only known species. It is not known to occur outside Europe. Once upon a time *Psarus abdominalis* was known from Sweden to Yugoslavia, but vanished from most parts of the continent at the same time as motorised vehicles replaced the horse. *Psarus* is a forest insect, associated today with oak firewood forests. When horses were used to haul out timber stems were cut by hand and taken out one by one. When the process became mechanised it was no longer economical to harvest in this way and clear-felling of larger areas became the norm,

synchronously destroying the forest micro-climate. Within the last 50 years *P. abdominalis* has been found in no more than 10 localities, most of them in Northern Greece. But *Psarus* existed a long time before man's forest management came to provide it with appropriate habitat. There are hints that *Psarus* also occupied oak forest subject to fires. Considerable effort is put into prevention of forest fires today and insects dependent on burnt forest are, as a group, much threatened. Insufficient is yet known about the requirements of *Psarus abdominalis* to ensure its survival.

Sphiximorpha petronillae was described in 1850, from a single specimen found in Italy, and in the following hundred and fifty years only two more individuals were recorded. Very recently a population of it has been found in an area of oak forest in NE Greece. Larvae of *Sphiximorpha* species inhabit small trunk cavities filled with fermenting sap, on old, living trees. The males of *Sphiximorpha petronillae* wait, motionless, on the trunks of hollow oaks, for females to appear. Despite their bright colours, when motionless on tree bark they become almost invisible. If disturbed *S. petronillae* can emit a loud and very wasp-like buzz, and raises its wings in apparent threat, which maximises its resemblance to *Polistes* wasps. This old forest insect remains one of Europe's most threatened syrphids, but is not included on any national or international list of species requiring protection.

Life of the dead tree

Temnostoma meridionale (top), *Sphegina sibirica**(left), *Xylota sylvarum**(right),

Trees living out their life-span, to die naturally, are rare in Europe's forests today due to commercial forest management. Most of the European hover flies associated with old trees are consequently rare, but a minority of them can develop in fallen or felled trees, or in tree stumps, which can be found in many forests. Larvae of *Temnostoma* species, like *T. meridionale*, tunnel humid trunk wood of oak and other deciduous trees some years after the tree has fallen, or been felled. *Sphegina sibirica* larvae live beneath the bark of recently felled conifers. Since the 1980's this insect has spread from Russia and Scandinavia south and west in Europe. It is now known to have reached central France and Ireland. *Xylota sylvarum* larvae inhabit fungus-ridden rotting stumps and roots of both deciduous trees and conifers. The adult insect specialises in collection of pollen from leaf surfaces, as well as feeding at flowers like buttercup (*Ranunculus*) and wild raspberry (*Rubus idaeus*).

Close relations

Volucella inflata (top left), *Volucella pellucens**(top right), *Volucella bombylans**(bottom left), *Volucella zonaria* (bottom right).

Volucella inflata larvae live in tree humus, but larvae of the other European species inhabit the nests of social insects, *V. pellucens* living with wasps (*Vespula* species), *V. bombylans* with bumble bees (*Bombus*) and *V. zonaria* with hornets (*Vespa crabro*) and the common wasp (*Vespula vulgaris*). In part, they are predators of the grubs of their hosts, for the rest feeding on rubbish that accumulates at the base of the nest. *Volucella inflata* flies early in the year and is to be seen on flowers of trees like spindle (*Eunonymus*) and whitethorn (*Crataegus*). The other *Volucella* species fly later and are very partial to the flowers of bushes like Buddleia.

The deceiver

*Microdon myrmicae**: adult (left), larvae (bottom right) and puparium (top right).

The larvae of *Microdon* survive in ants' nests, feeding on the ants' offspring at night, when the ants are mostly inactive. They achieve this unlikely way of life by copying the ants' "smell" so exactly that the ants are unable to detect them. The shape of the *Microdon* larva is such that, when they are motionless on the side of one of the tunnels in an ants' nest, they seem like shallow bumps in the surface, so the ants just walk over them without reacting to their presence.

Egg-laying females of *Microdon* also require the correct “signature” smell in order to lay their eggs at the nest entrance. If they have the wrong smell they can be torn to pieces. The resemblance of their larvae to small slugs resulted in *Microdon* being first described as a mollusc, subsequently causing consternation when it was found that the slug hatched one day into a fly. *Microdon myrmicae* larvae inhabit nests of the same ants that act as hosts for caterpillars of the large blue butterflies (*Maculinea* species), and can occur together with them in the same ants’ nest. Today, *M. myrmicae* is largely confined to the margins of wetlands, where its ant hosts can maintain large populations in tussocks of sedge and moss. *Microdon* species do not feed at flowers, but are recognised as specialist pollinators of certain orchids (*Ophrys* species), which in their appearance closely mimic female *Microdon*. The males of *Microdon* species attempt to mate with the orchid, whose pollinia become attached to the *Microdon* in the process.

*Species occurring in Ireland. With the exception of *Sphiximorpha petronillae*, all of the species depicted are known from France.