



Royal
Entomological
Society



Insects in green spaces



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INTRODUCTION

This guide gives you an overview of the different types of insects, with advice on how you might create a place for them to live in a green space near you.

Insects play so many roles in our world, from pollinating flowering plants including crops, helping decompose plant and animal material, keeping populations of other insects in check with predation, and providing food for larger animals such as mammals and birds.



Declines of insect populations have been recorded, due to many factors such as decreasing habitat, extremes of weather and use of agrochemicals. There is good news however, as research shows that humans can act to help insects. We can increase habitats for insects with whatever green space we might have nearby. Any local green space, be it a window box, a strip of earth by a front door, a back garden or a local community area, is an opportunity to create a home for insects and other invertebrates.



Professor Jane Hill, University of York, RES President

"Providing space for insects doesn't have to involve great effort or expense. Small actions can provide great benefits, and once you start to notice the insects in your local area, watching them go about their business can provide all the drama and joy of the best nature documentaries. We hope this guide to the different groups of insects that exist will help you enjoy the insects in your garden, windowsill, and or local park, and help them to thrive."



Simon Ward, RES CEO

"The RES vision is to enrich the world with insect science. Insects are the most abundant group of animals in the world and more than one million species have been described so far, with many more discovered every year. This guide highlights the 27 different groups of insects in existence from the most common to the most scarce. We hope it will inspire you to create some insect habitat in your green space, or just to realise how remarkable and valuable insects are."



INTRODUCTION



Here, Tom Massey, designer of our RHS Chelsea garden, shares his top tips on encouraging beneficial insect life in your garden:

Go organic and pesticide-free

It's about creating a natural balance in the food chain – encouraging beneficial insects means less need for chemical control. Natural predators will eat the less desirable insects for example ladybirds, hoverfly larvae and parasitic wasps all eat aphids.

Don't tidy up

Turning a blind eye to some of the messier areas of your garden will provide valuable shelter for insects. Piles of leaves, plants that have gone over or dead wood all provide food and habitat for the smallest of creatures. It will benefit nature if we opt for a looser and more relaxed style of gardening, and if you can, leave some areas untouched altogether.

Embrace weeds

Plants that are commonly considered weeds such as dandelions, clover, vetch and knapweed are important food sources for insects and all had a place in the RHS Chelsea Garden. We need to rethink our attitude towards weeds. Dandelions for example provide one of the earliest sources of pollen and nectar and grow quickly going from seed to flowering plant in just ten days. Nettles are the preferred plant for the peacock butterfly to lay their eggs, providing an important food source for the developing caterpillars.

Welcome the less attractive insects

Butterflies and bees get most of the glory but try to be accepting of all types of insects and invertebrates – they all play an important role in the ecosystem and without them our gardens simply can't thrive. Wasps and ants may be seen as the enemy, but they are actually really important in breaking down material and are a valuable food source for other garden animals such as frogs and birds.

Create a range of habitats

Our RHS Chelsea Garden includes rammed earth floors, hoggin pathways, log piles, rubble, bare sand and gabion walls. Choose permeable, natural hard landscaping materials such as dry-stone walling and woven willow fences that provide crevices and gaps where insects can shelter.



INTRODUCTION

Let the grass grow

By mowing less and leaving your grass to grow you are providing an important food source for pollinators. This is important throughout the year, but especially in May and June.

Include a water source

All wildlife needs water so create some wet areas such as a pond, boggy area or a chemical free water feature. Even just leaving places where rainwater can collect or small containers provides a place where butterflies, moths and other insects can drink or make their home.

Choose a wide range of plants with year-round interest

Plant perennials and shrubs that flower at different times of the year to prolong the seasons when insects can feed and thrive. Also think about choosing different types of flowers and plant forms to suit different insects – bumblebees and butterflies have ‘tongues’ for accessing nectar from long, narrow flowers such as beans and foxgloves, but most hoverflies have simple mouthparts with no ‘tongue’. They need flowers with easily accessible nectar and pollen such as umbels including fennel and achillea. Don’t forget about trees as an important source of food and habitat – for example silver birch and native hawthorn support hundreds of species of insect.

Get composting

Not only is making your own compost a great way to reduce waste for your bin collection and provide nutrient-rich compost for your garden, but the compost heap itself is a fabulous habitat for insects where they can live, feed and aid the composting process.

Reduce artificial lighting

Too much artificial light will disturb the activities of nocturnal insects such as moths. If you install lighting, use them sparingly, choose low energy LED lights and ensure you can switch them all off manually when not in use. Also consider lights that point downwards and wash light over the ground rather than glaring up into the sky.



MEGALOPTERA

Alderflies, dobsonflies and fishflies



Liam Crowley

What do they look like?

Alderflies are medium-sized, dark insects with 4 large membranous wings held over the body in a tent-like fashion.

Where do they live?

The larvae live in ponds or slow-moving water. Adults can often be found resting on vegetation near water.

When can you see them/lifecycle

Adults can be seen in early summer when they emerge from the water. They typically live in their adult form for 2-3 weeks.

What do they do?

The larvae are aquatic predators, preying on a wide range of invertebrates. Adults tend to stay near water and spend most of their time breeding.

How to create habitat?

Adding a pond will provide somewhere for alderfly larvae to live. Vegetation around the pond edge will provide somewhere for females to lay eggs.

Where to find out more?

<https://lacewings.myspecies.info/>



ZORAPTERA

Angel Insects

Dominique Vassie

What do they look like?

Angel insects are soft-bodied insects, usually pale or brown in colour, with compact bodies and relatively long, beaded antennae with nine segments. They are very small, no more than 3mm long and look a little like termites. They have two different forms: blind wingless individuals which form the majority of their small colonies and occasionally rarer winged individuals with eyes.

Where do they live?

These tiny insects are usually found under dead tree bark, rotting logs or moist leaf litter, inside crevices or within human-made sawdust piles. They are widely distributed and have been found on all continents except mainland Australia, but mostly favour warmer, tropical climates.





ZORAPTERA

Angel Insects

Continued

When can you see them/lifecycle?

These insects hatch as tiny nymphs that resemble the adults and live within their colonies. Adults may live for around three months, but angel insects are quite rare and the winged individuals, which may occasionally come to light, are even rarer. They can be found year-round in tropical climates.

What do they do?

Angel insects are amongst the least understood insect groups and mainly feed on fungal spores and hyphae. They live in small colonies and spend much of their time grooming one another, likely removing fungal pathogens. Aggressive males form strict hierarchies and defend harems of females, possibly the only example of a patriarchal society within insects.

How to create habitat?

No species of angel insects have yet been found in the UK, but these tiny animals like decaying plant matter so leave an area in your garden where things can rot down naturally. Maybe add some old logs and dead leaves to slowly decay. Even if this habitat doesn't bring in angel insects, plenty of other beautiful invertebrates and fungi will enjoy it too!

Where to find out more?

<https://en.wikipedia.org/wiki/Zoraptera>



HYMENOPTERA

Ants, bees, wasps and sawflies



Liam Crowley

What do they look like?

Hymenoptera includes bees, wasps, ants and sawflies. Most species have two pairs of membranous wings, although many, such as ants, have lost these in some sexes or forms. All but the sawflies have a narrow waist and in some groups the female possess a stinger. Most bees are very hairy, with specially designed hairs for collecting and carrying pollen.

Where do they live?

Hymenoptera can be found anywhere there are plants or prey. They are often most easily seen visiting flowers. Many species like open, sunny habitats

When can you see them/lifecycle?

Most species are active at some point between early spring and autumn. Some species are social, with queens, workers and males, although most species are solitary.



HYMENOPTERA

Ants, bees, wasps and sawflies

Continued

What do they do?

They do most of their feeding as larvae, although adults frequently drink nectar for energy. Most sawflies are herbivores, bees feed on pollen, wasps are parasitoids or predators, and ants are predators, aphid farmers and/or seed eaters.

How to create habitat?

Having lots of different plants will support Hymenoptera. Nectar and pollen rich flowers are particularly good at providing food for many species. Ensuring as wide a ranging flowering period as possible will ensure food is available throughout the flight period.

Where to find out more?

<https://www.bwars.com/>

<https://www.bumblebeeconservation.org/>

<https://www.bigwaspsurvey.org/>





COLEOPTERA

Beetles



Francisca Sconce

What do they look like?

Most beetles have thick wing cases (elytra) covering their abdomen. In the UK the largest beetle is the stag beetle at up to 7.5 cm long, the smallest is a featherwing beetle at under 1mm in length.

Where do they live?

Beetles are adapted to lots of different roles in our world and have the most diverse lifestyles of all animals.

When can you see them/lifecycle

Different groups of beetle are visible at different times of year. In spring you are likely to see the larvae or caterpillars on plants.

What do they do?

Some beetles feed on living and dead plants, others hunt other insects. Beetles are also important pollinators for some flowering plants.

How to create habitat?

Providing lots of different plants will attract different types beetles, from ladybirds to longhorns to chafers. Deadwood piles, compost heaps and rockeries will provide shelter and resources for saproxylic (deadwood feeding) beetles.

Where to find out more?

<https://www.colsoc.org/>



PSOCODEA

Booklice, barkflies and parasitic lice



Beulah Garner

What do they look like?

The Psocodea are soft-bodied, secretive insects with chewing or sucking mouthparts. Booklice are wingless and usually no bigger than 2mm. They have a large head, small eyes and long thread-like antennae. They can vary from almost translucent to grey-brown in colour. Barkflies are mostly winged, often with distinct patterns. They can grow up to 10mm in length but are usually much smaller. They have a prominent head with big eyes and long thread-like antennae. Parasitic lice have chewing or sucking mouthparts, they are 0.5–6mm in length with characteristically flattened oval shaped bodies. All lice have grasping claws and are brown to red in colour.



Where do they live?

Booklice are found inside, and sometimes even inside books, anywhere indoors where a damp or mouldy environment exists, such as walls and stored grain. Barkflies also like a damp environment but are associated with natural habitats like leaf litter. Parasitic lice are parasites feeding on warm blooded animals.

When can you see them/lifecycle

The Psocodea can be found all year round. Though a typical life-cycle may only last a few months, these insects are often parthenogenic, meaning they can reproduce without fertilization. They have an incomplete metamorphosis, having a few generations of nymphs that eventually develop into an adult form.

What do they do?

Booklice like to feed on microscopic moulds and starchy materials, such as in book-binding glue. Barkflies are usually associated with woodland habitats, and are beneficial helping to break down detritus. Some live under a silken blanket in large numbers on the surface of bark. Parasitic lice are obligate parasites, so without a warm-blooded host the louse could not survive. The lice with chewing mouthparts usually feed on skin and detritus, lice with sucking mouthparts feed on the blood of their animal hosts.

How to create habitat?

Barkflies like algae and lichen, so providing trees as well as woodpiles and leaf litter is an ideal habitat. Set aside some wild areas in your garden and Barkflies will thrive.

Where to find out more?

<http://schemes.brc.ac.uk/barkfly/homepage.htm>

<https://www.royensoc.co.uk/shop/publications/handbooks/psocodea/psocids-psocoptera-booklice-and-barklice/>

<https://www.amentsoc.org/insects/fact-files/orders/psocoptera.html>



ARCHAEOGNATHA

Bristletails



Victoria Burton

What do they look like?

Bristletails are elongated, wingless insects up to 1.8 cm long, with long antennae and three long rear appendages giving a three-tailed appearance. Their bodies are covered in scales, and they can jump several centimetres into the air.

Where do they live?

Most species live by the coast, in rock crevices, and a few species live in woodland under bark and in leaf litter.

When can you see them/lifecycle

They are most often seen running over seaside rocks above the high-water mark.

What do they do?

Bristletails feed mostly on algae, lichens, and mosses from the rocks they live on. Woodland species are decomposers, feeding on leaf litter and other plant detritus.

How to create habitat?

These insects are not often found in gardens, but if they are they can be encouraged by providing piles of rocks and leaving areas of leaf litter for them.

Where to find out more?

<https://www.royensoc.co.uk/understanding-insects/classification-of-insects/apterygota/archaeognatha-or-microcoryphia/>



LEPIDOPTERA

Butterflies and moths



Dominique Vassie

What do they look like?

Both adults and larvae come in a rainbow of colours and patterns. The larvae, known as caterpillars, are soft-bodied with 3 pairs of true legs near the head and generally 2-5 pairs of soft prolegs towards the rear. Adult insects have bodies and wings covered in tiny scales and vary in wingspan from a few mm to over 25 cm!

Where do they live?

Nearly all caterpillars are herbivorous and found on the leaves and stems of host plants. Both adult moths and butterflies can be found in a wide range of habitats from wild meadows to city-centre gardens.



LEPIDOPTERA

Butterflies and moths

Continued

When can you see them/lifecycle?

In the UK, most species of butterflies and moths spend the winter hiding away as caterpillars or pupae. Come spring and summer, the active adults and larvae will be visible in areas with suitable habitat. Butterflies are diurnal so easier to see than their mostly nocturnal moth cousins. Moths are generally best seen resting in the day or attracted to light or moth trap by night.

What do they do?

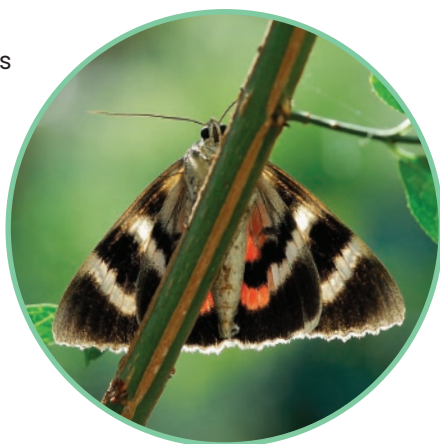
Caterpillars are an excellent food source for other insects and birds, adult butterflies and moths are important pollinators and feed on flower nectar. Butterflies can usually be seen flying between food sources such as flowers, or warming up their bodies on a sunny wall. The equally beautiful moths can be harder to spot as most hide in the day.

How to create habitat?

Grow tree and herbaceous plant species which provide food for both adult insects and their caterpillars across the year. Moths at all life stages like decaying plant matter to hide in, so leave bits of your garden messy, and let those dandelions flower in spring to provide essential nectar for newly emerging insects.

Where to find out more?

<https://butterfly-conservation.org/>





TRICHOPTERA

Caddisflies or sedge flies

Arron Watson

What do they look like?

Adults caddisflies have 2 pairs of membranous wings, held like a tent over their back when at rest, and long antennae. When they are aquatic, they do not have wings. They have six legs at the top of their body with a soft finger like behind, many of the caddisfly have a case which is like a sleeping bag made from stone or plants and twigs. They have long legs which help pull them around in their case, or the caseless species dig in sediment and climb.

Where do they live?

Caddisflies live two different lives, firstly as juveniles (nymphs) they live in different types of rivers, ponds and lakes. They then transform (metamorphosize) into an adult and crawl out of the river on to land, where they mate and females lay eggs.

When can you see them/lifecycle?

Nymphs are found in rivers or ponds and lakes where they live at the bottom. Adults are much easier to see when they climb vegetation, to fly to neighbouring waters during summer.



Look out for them near any water during warm sunny days.

What do they do?

Caddisfly nymphs do a great job of cleaning up the riverbed, eating plants and decaying material, and hiding in the sediment (caseless nymphs) or in their case to hide from predators. They do not feed when they become adults.

How to create habitat?

Providing freshwater is the best way to create space for caddisflies.

Where to find out more?

<https://www.fba.org.uk/>



BLATTODEA

Cockroaches and termites



Victoria Burton

What do they look like?

Cockroaches usually have a broad, flattened body and long antennae. Termites are often pale coloured, with short antennae. Some Blattodea have functional wings; others have short flightless wings or none.

Where do they live?

The Blattodea prefer warm environments. A few species live in homes and other buildings, but others live in woodland, heathland, and coastal grasslands.

When can you see them/lifecycle

Most species of cockroaches produce a hardened egg case (ootheca), which will hatch out into nymphs looking like small versions of the adult. Some cockroaches show parental care, and this is taken to the extreme in termites which are eusocial, living in colonies with a reproductive king and queen, workers, and soldiers.

Where do they live?

Cockroaches are omnivores, feeding on dead plant and animal material, and can be important recyclers. Termites are major decomposers of dead wood, but some species can cause building damage.

How to create habitat?

These insects are not often found in gardens, but providing deadwood and leaf-litter piles will provide shelter and food when they do occur.

Where to find out more?

Grasshoppers and Related Insects
Recording Scheme of Britain and
Ireland International Union for the
Study of Social Insects



ODONATA

Dragonflies and damselflies



Chris Hassall

What do they look like?

Adult dragonflies and damselflies are quite large flying insects with two pairs of wings. Males are often blue, red or yellow, while females tend to be green or brown. Damselfly adults tend to be smaller than dragonflies and rest with their wings held together over their backs, while dragonflies rest

with their wings held out horizontally. In the water, Odonata young (larvae) have long bodies coloured green or brown for camouflage. Both groups walk underwater and use wavelike body movements (damselflies) or jet propulsion (dragonflies) to chase their prey.



ODONATA

Dragonflies and damselflies

Continued

Where do they live?

Dragonflies and damselflies live on every continent except for Antarctica, but are more common in tropical areas. Some species travel across oceans on 18,000km migrations. They live around all kinds of freshwater, from small, temporary ponds to the world's largest lakes and rivers.

When can you see them/lifecycle

Dragonflies and damselflies can be found year-round in the water as larvae. Adults start to emerge in spring and are most seen near the water in summer.

What do they do?

Dragonflies and damselflies are vital predators in water as larvae, where they eat other invertebrates as well as small fish and amphibians. On land they eat flying insects such as mosquitoes and midges.

How to create habitat?

You can dig a pond in your garden for dragonflies and damselflies to lay their eggs and develop as larvae, many common species breed happily in a pool as small as 1m². Make sure that there are some submerged and emergent plants and try to put the pond somewhere sunny so that the water is warm.

Where to find out more?

<https://british-dragonflies.org.uk>





DERMAPTERA

Earwigs

Beulah Garner

What do they look like?

Earwigs are long and thin with bodies up to 15mm, they are dark brown and shiny and have long antennae. They have a pair of characteristic pincers (cerci) on the end of their flexible abdomen, males have curved pincers and females have straight pincers. Earwigs have a pair of folded membranous wings, held underneath a pair of protective wing cases.

Where do they live?

Earwigs like to live in dark, damp places and are very secretive. During the day they can be found resting in cracks and crevices or under stones and in compost heaps.

When can you see them/lifecycle

Earwigs can be found all year round, though like most insects, are active from Spring to Autumn. They have an incomplete metamorphosis, with a few generations of nymphs that eventually develop into an adult form. The female looks after her eggs throughout the Winter until they are ready to hatch in the Spring.



What do they do?

Most earwigs are beneficial in ecosystems, they are detritivores (feeding on dead plant matter) and are carnivores. They are also one of the few types of insects that practice maternal care. Males use their pincers to fend off predators or to catch their own prey, they also use them to attract females.

How to create habitat?

Keep your garden wild with lots of places for earwigs to shelter, like a compost heap, dead wood piles, and a rockery. You can even find them living under plant pots and garden sheds. Provide plenty of dead organic matter and they will help to keep your garden healthy.

Where to find out more?

<https://www.wildlifetrusts.org/wildlife-explorer/invertebrates/other-insects/common-earwig>



SIPHONAPTERA

Fleas



Liam Crowley

What do they look like?

Fleas are small, dark, wingless insects with long back legs that enable them to jump strongly. They are flattened sideways, allowing them to move easily amongst the hair or feathers of their hosts.

Where do they live?

Fleas are parasites of birds and mammals. They can be found on the bodies or in the nesting material of their hosts.

When can you see them/lifecycle

As the hosts are warm blooded, they can be active throughout the year. Outdoors in the wild they usually most abundant during the nesting period of their host.

What do they do?

Fleas are parasites that feed on blood, using specialised piercing and sucking mouthparts. Bites from fleas can be highly irritating, causing intense itching, and may transmit diseases such as typhus and plague.

How to create habitat?

Fleas are strongly associated with their host, so habitat that support birds and mammals will indirectly support them also.

Where to find out more?

<https://www.brc.ac.uk/scheme/siphonaptera-and-phthiraptera-recording-scheme>

<https://britishfleas.myspecies.info/>



ORTHOPTERA

Grasshoppers, crickets and bush-crickets

Jim Hardie

What do they look like?

Orthoptera are medium to large insects with long, muscular hind legs modified for jumping although many species also fly using two pairs of wings. Grasshoppers and ground-hoppers have antennae that are shorter than their body length while crickets have longer antennae. Female bush-crickets have blade/sword-like egg laying tube (ovipositor) at the rear and males a pair of long, tail like filaments (cerci) which are used in mating. Female crickets have straight, narrow ovipositors and both sexes have long straight cerci. There can be great variation in colour and appearance as they tend to blend in with the background of wherever they live.

Where do they live?

Usually in vegetation but some crickets burrow into soil. Ground-hoppers like damp conditions and are good swimmers, even underwater.





ORTHOPTERA

Grasshoppers, crickets and bush-crickets

Continued

When can you see them/lifecycle

They are common in summer months when you can also hear grasshoppers, bush-crickets and crickets (though not ground-hoppers), as they communicate using mating songs. The songs are produced by rubbing one body part against another and different species use different songs. Eggs can be laid in plants or in soil and hatch into nymphs which resemble the adults but have no wings. After a number of moults the nymphs mature to adults.

What do they do?

Most orthopterans feed on plants but some are carnivorous and prey on other insects. Locusts are grasshopper species that under certain conditions, such as high population densities, change their appearance and behaviour. They form large swarms that can destroy vast areas of agricultural crops. There are no native locusts in the UK but they are sometimes found as they are sold as food for pet reptiles/spiders and can escape.

How to create habitat?

Often seen on lawns and preferably when grass is long. Ground-hoppers like damp areas and ponds.

Where to find out more?

<https://orthoptera.org.uk/>

<https://www.royensoc.co.uk/understanding-insects/classification-of-insects/orthoptera/>





NOTOPTERA

Gladiators and Ice crawlers



Shaun Winterton

What do they look like?

Gladiators and ice crawlers are long, wingless insects that resemble the immature stages of stick insects. They are commonly medium sized and robust, with long legs and antennae.

Where do they live?

Gladiators occur exclusively in arid parts of Southern Africa while ice crawlers live in extremely cold environments in North America and Asia where they live in glaciers, caves and frigid montane areas.

When can you see them/lifecycle

Both are found year-round. Ice crawlers live near snow and ice and move underground when conditions get too cold.

What do they do?

Gladiators are strictly predators while ice crawlers are omnivorous as they also eat a lot of plant material.

How to create habitat?

It is rare and difficult to encounter both groups. The natural habitat for gladiators is grassland and massifs in arid habitats, while ice crawlers live in conditions near freezing at all times.



NEUROPTERA

Lacewings, antlions, dustywings and mantidflies



Shaun Winterton

What do they look like?

Lacewings are delicate insects with long wings covered in net-like venation typically in a pattern resembling lace. Size can vary widely, with antlions being relatively large while dustywings are minute (3–5 mm) and covered in a dusty, white wax.

Where do they live?

Lacewings are found throughout the world, but are more diverse in the tropics. Just over seventy species representing six major groups of lacewings occur in the UK.

When can you see them/lifecycle

Lacewings are active throughout the warmer months, although some green lacewings can be found hibernating as adults. Most groups are particularly active in late spring and summer. Some have immature stages that are

aquatic, while others are soil dwelling or live exclusively amongst plant bark and foliage.

What do they do?

Both adult and immature lacewings are predators that are considered highly beneficial in controlling pests in agricultural crops and gardens. Adults of many green lacewings may feed on pollen.

How to create habitat?

Providing a diversity of habitats is important for attracting lacewings. Sandy soil under overhangs will attract antlions, while planting shrubs and trees will attract many lacewings of all types. Freshwater streams free of pollution are important habitats for certain aquatic lacewings.

Where to find out more?

<https://lacewings.myspecies.info/>



MANTODEA

Mantises

Gary Needham

What do they look like?

Mantises can be 2–18cm in length and are some of the most easily recognised insects. One of the most recognised is the Praying Mantis. It has a broad, triangular head with large eyes and a long body (the prothorax and abdomen). The abdomen protects their wings. Their front legs can fold back and are adapted to catch prey with rows of sharp spines. The males are smaller than the females.

Where do they live?

They can be found in warm, dry areas in central and southern Europe.

When can you see them/lifecycle

During the warm months in late summer and early autumn.

What do they do?

Mantids often have excellent camouflage and will sit very still waiting for prey to approach or use small, stealthy movements to stalk prey. Mantids usually eat other insects, but some larger species have been known to eat small lizards, fish and even birds!

How to create habitat?

They are very rare in the UK and any sightings are likely to be escaped pets!

Where to find out more?

UK Mantids Facebook page
Royal Entomological Society
Amateur Entomologists' Society





EPHEMEROPTERA

Mayflies or upwing flies

Liam Crowley

What do they look like?

Mayflies have large triangular wings with intricate venation. Wings are held vertically above their body at rest. They have large eyes and short antennae, and two or three long filaments arising from the end of the abdomen.

Where do they live?

Nymphs live in freshwater and the short-lived adults rarely travel far from freshwater.

When can you see them/lifecycle

Adults may be seen emerging en-mass from water bodies during synchronised emergences in spring or summer. The adult stage lasts from a

few hours to several days depending on the species.

When can you see them/lifecycle

The aquatic nymphs feed on algae, although a few species are carnivorous. Adults sole function is to reproduce, and they do not feed as they lack mouthparts.

How to create habitat?

Adding a pond will provide somewhere for mayfly nymphs to live. Larger water bodies will support more individuals and may be more attractive to females for egg laying.

Where to find out more?

www.insectweek.org/discover-insects/mayflies-upwing-flies/





MECOPTERA

Scorpionflies



Shaun Winterton

What do they look like?

Scorpionflies are charismatic insects with elongate faces and wings with net-like venation. Size can vary slightly, but most are around 25mm. Snowfleas are much smaller and are wingless. They resemble fleas and can jump.

Where do they live?

Scorpionflies are found worldwide, but are more diverse in the tropics. Snowfleas are by contrast only found at in temperate regions and high elevation as they prefer the cold. Only three species of scorpionfly and one species of snowflea occur in the UK.

When can you see them/lifecycle

Scorpionflies are active throughout the warmer months, where adults perch on undergrowth in forests awaiting

prey. Snowfleas are active during the winter months and are often found on moss or snow.

When can you see them/lifecycle

Both adult and immatures are predators that are considered highly beneficial in natural habitats.

How to create habitat?

Providing plenty of undergrowth in your garden, especially ferns, will attract Scorpionflies.

Where to find out more?

<https://lacewings.myspecies.info>



ZYGENTOMA

Silverfish and firebrats



Gary Needham

What do they look like?

Silverfish only grow up to 12mm long and have a narrow, flattened body covered in microscopic shiny scales. They have three long 'tails' and long, waving antennae. Firebrats are similar in shape but lack the shiny scales. They both move very fast to avoid predators.

Where do they live?

Silverfish can be found in damp, small crevices in the house and can sometimes be found around the bath and sinks. Firebrats can also be found indoors but prefer warmer areas such as nearby boilers and heating systems.

When can you see them/lifecycle

Both can be found all year round.

What do they do?

Silverfish and Firebrats are no harm to you, the garden or house. They will eat organic materials such as paper and food crumbs or flour.

How to create habitat?

It's difficult to attract these insects inside, but if you see a silverfish or firebrat in your home, leave them be.

Where to find out more?

Royal Entomological Society
Amateur Entomologists' Society



RHAPHIDIOPTERA

Snakeflies



Liam Crowley

What do they look like?

Snakeflies are not often encountered. Both adults and larvae have a long 'neck' and they may rear up like a snake about to strike. Adults have two pairs of membranous wings with an intricate pattern of veins.

Where do they live?

Larvae live under bark and adults spend most of their time in tree canopies. Adults are most commonly seen after strong winds which can blow them down from the canopy.

When can you see them/lifecycle

Adults can be found during the summer, but larvae may be seen under bark throughout the year.

What do they do?

Both adults and larvae are predatory. Larvae feed on other insects that also live under bark. Adults feed on other insects and may also feed on pollen.

How to create habitat?

Having trees, especially large and mature trees can support snakeflies. In particular, leaving dead wood in place is essential habitat for larvae.

Where to find out more?

<https://lacewings.myspecies.>



PHASMIDA

Stick-insects



Gary Needham

What do they look like?

As their name suggests, many stick insect species mimic (copy) the look and shape of twigs, bark or leaves. They are wingless with narrow bodies, long legs, short antennae and are often shades of green/brown in colour. The eggs resemble plant seeds.

Where do they live?

There are four species of stick insect in the UK that tend to live on 'prickly' plants. These can be found in rural areas of Devon and Cornwall, including on the Isles of Scilly. Many people keep stick insects as pets.

When can you see them/lifecycle

The best time of year to see them is in the warmer summer months.

What do they do?

Stick insects have excellent camouflage and will sit very still most of the time to avoid attracting predators. They eat the leaves of plants and particularly enjoy bramble (blackberry bushes).

How to create habitat?

Although they are confined to the South West of England, having privet hedging in the garden can give native stick insects a home.

Where to find out more?

Phasmid Study Group
Royal Entomological Society
Amateur Entomologists' Society



PLECOPTERA

Stoneflies

Hayley Jones

What do they look like?

When they are at the nymph (early development) stage which is aquatic, they do not have wings. They have long antennae and only two tails, strong long legs and some have beautiful patterns on their back. When they become adults, many are dark colours (grey/black) with 2 pairs (4 in total) of thick membranous wings that overlap each other flat on their back when at rest. Their two tails are usually present, while their antennae will most likely always be visible.

Where do they live?

Stoneflies live two different lives, firstly as juveniles when they are referred to as nymphs, they live in rivers, usually found in highly oxygenated, flowing rivers. They then change (metamorphosize) into an adult and crawl out of the water into a flying adult where they mate.





PLECOPTERA

Stoneflies

Continued

When can you see them/lifecycle

Many of the stone flies will turn from nymph to adult in the same year, adults emerging from rivers through the summer warmer periods. However, some stonefly nymphs will be present all year round and the bigger species will stay as nymphs for a period of years growing as big as an inch in size before they turn into adults.

What do they do?

Stonefly species are a mix of predators feeding on invertebrates, herbivores feeding on algae and plants or detritivores feeding on plants that are rotting and easier to eat. What to watch out for? Get involved with a local group to learn about how to safely sample in rivers. Always seek guidance before entering a river if looking for these creatures. A great citizen science scheme is the Riverfly Partnership which is a UK wide scheme free to the public.

Where to find out more?

"Introduction to UK Stoneflies"
on YouTube by the Tanyptera Project - (137)
Introduction to UK Stoneflies - YouTube





THYSANOPTERA

Thrips



Jim Hardie

What do they look like?

These are small, slim insects around 1 – 7mm long though most are less than 3mm. Some species have wingless adults whilst most are winged and can fly. Those with wings have two pairs, both of which are narrow and fringed with hairs, at least along the hind margin, making them feather-like. This gives them their name - Thysanoptera means fringed wings. These wings are not very efficient for flight.

The word thrips is both singular and plural, that is, 1 thrips + 10 thrips = 11 thrips.

Where do they live?

Thrips live on plants, fungi, under tree bark and in leaf litter.

They have an unusual lifecycle. In the first two stages of their development they resemble the adult but without wings. These are called nymphs, the next stage may have undeveloped wings, called wing pads, but does not feed, this is the pro-pupa.

The fourth stage may have larger wing pads but is more like a pupa than a nymph. Finally the winged adult emerges. This is a kind of gradual metamorphosis from egg to adult



THYSANOPTERA

Thrips

Continued

and different from other insect orders which develop from egg to nymph to adult or egg to larva to pupa to adult.

When can you see them/lifecycle

The adults can be seen during summer when they are also known as thunderflies or thunderbugs as they appear airborne, in enormous numbers during warm and humid conditions that often accompany thunderstorms. The harvesting of cereal crops also disturbs vast numbers of thrips. At these times the insects can get everywhere and can be felt tickling as they walk on skin. Happily they do not bite! They can also accumulate in houses where they tend to gather in tiny spaces in furniture, behind the glass in picture frames and even in computer screens. In glasshouses they may be seen for longer periods.

What do they do?

Many species feed on plant leaves and in flowers but others feed on fungi or are predators of small invertebrates such as mites. As thrips are small and often inconspicuous, they are a little-

known group. They feed by puncturing the food source, with the left mandible as the right is not functional or absent, and sucking out the fluids. They can damage commercial crops directly by feeding on them and by transmitting plant viruses.

How to create habitat?

Perhaps not the most welcome insects in the garden or glasshouse but having plants and trees plus leaf litter and opportunities for fungi to grow should encourage thrips.

Where to find out more?

<https://www.royensoc.co.uk/understanding-insects/classification-of-insects/thysanoptera/>



HEMIPTERA

True bugs



Liam Crowley

What do they look like?

All true bugs possess tubular mouthparts called a rostrum. It is a large and diverse group including aphids, shieldbugs, whitefly and planthoppers and pondskaters. Some species are highly camouflaged.

Where do they live?

True bugs can be found across all land and freshwater habitats. Many species are closely associated with different plants. Aquatic species may be seen on or under the surface of water.

When can you see them/lifecycle

They can be seen throughout the year as some species overwinter as an adult. Overall, they are more abundant during the summer.

What do they do?

Many species are herbivorous, feeding on plant sap, some of which are important pests. Lots of other species are predators, feeding on a wide range of invertebrate prey.

How to create habitat?

Having lots of different types of plants will support a wide range of true bugs. Trees also support many species of Hemiptera. A pond will provide suitable habitat for aquatic species.

Where to find out more?

www.royensoc.co.uk/understanding-insects/classification-of-insects/hemiptera/



DIPTERA

True flies



Victoria Burton

What do they look like?

Most Diptera have well-developed forewings and the hindwings are reduced to a pair of balancing organs called halteres. Many flies are tiny, less than 1mm long, with the largest in the UK up to 5cm.

Where do they live?

Flies are one of the most diverse groups of animals and can be found in every habitat other than the open sea.

When can you see them/lifecycle

Different kinds of flies are visible at different times of the year. Their larvae are legless maggots, and, like the adults, they can be found in a

variety of habitats, including in soil, decomposing material, feeding inside plants, and in water.

What do they do?

Flies are important pollinators for some plants, especially early spring, and winter flowerers. Others are predators of other invertebrates or parasites of animals or plants. Many fly larvae are decomposers of dead plant and animal material.

How to create habitat?

Growing many kinds of plants will attract different types of flies. Flowers with open flowers such as the carrot family are particularly attractive to hoverflies. Providing deadwood piles and compost heaps will provide shelter for decomposers. Creating a wildlife pond, even a small one, provides a habitat for flies with aquatic larvae.

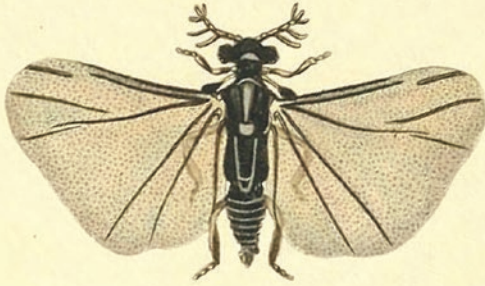
Where to find out more?

Dipterists Forum – the society for the study of flies (Diptera)



STREPSIPTERA

Twisted wing flies



Gary Needham

What do they look like?

Twisted wing flies are no more than 4mm in length. They have two pairs of wings with the hind (back) wings being larger than the fore (front) wings. It is the hind wings that twist when in flight, giving them their name. The fore wings act as balancers or halteres.

Where do they live?

Twisted wing flies are in fact parasites of other insects so can be found on larger invertebrates.

When can you see them/lifecycle

Due to their small size and parasitic lifecycle, they are very difficult to find and as such very little is known about them outside of special study groups.

What do they do?

The males and females mate on a host insect and the eggs develop and hatch inside her body. The larvae leave the female's body in search of a new - often larval - host close by, and burrow through the cuticle (skin). The larvae live inside the host feeding from the inside before emerging as an adult fly.

How to create habitat?

Twisted wing flies are obligate parasites which means this is the only way they can live, so it is not possible to create a habitat for them.

Where to find out more?

Royal Entomological Society
Amateur Entomologists' Society



EMBIOPTERA

Webspinners

Gary Needham

What do they look like?

Web spinners are small, cylindrical insects with short legs. Their front tarsi (feet) are enlarged and contain silk glands.

Where do they live?

Groups of web spinners live in their webs or silk tunnels under leaf litter.

When can you see them/lifecycle

They are rarely seen due to the fact they spend most of their lives within their silk 'galleries'.

What do they do?

Web spinners eat plant material and will continue to spin extensions to their galleries to reach new food sources. It is thought that the males feed, and that they die soon after mating.

How to create habitat?

Web spinners are found in warmer climates such as the tropics and subtropics so creating a suitable habit in the UK is very difficult.

Where to find out more?

Royal Entomological Society
Amateur Entomologists' Society





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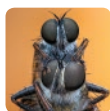
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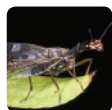
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