



Minibeasts in your garden

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By far the most numerous and diverse of animals, on the planet and in the garden, are the minibeasts – invertebrates. They include spiders, snails, woodlice, worms, millepedes and centipedes, false scorpions, mites, earthworms and, of course, the ever-abundant insects.



Sycamore moth caterpillar.

Gardens are ideal for minibeasts, often full of useful microhabitats such as ponds, compost heaps, rockeries, flower borders and shrubberies that mimic good examples of natural habitats. Unlike much of the countryside, gardens provide a continuous habitat, separated only by hedges and fences and are havens for our smaller wildlife. Some species, such as the impressive stag beetle, are now commoner in gardens than in the wider countryside.

Gardens can be ideal homes for minibeasts.



Cardinal beetle.

Thousands of minibeast species inhabit gardens and it is easy to find scores in a single day. A fifteen-year study of a typical Leicester garden found over 2,100 species. Some turned up only very occasionally, but others were long-time residents.

Sadly, some people don't appreciate the wealth of wildlife on their doorstep, thinking of minibeasts with fear and revulsion, or consider all of them as pests. However, only a tiny handful of creatures bite or sting, or ravage our plants and it is these that have given the rest a bad name.

Minibeasts are vital in the smooth running of both the garden and the

world. They pollinate crops and flowers, tidy up the remains of dead plants and animals, and are vital links in the food-chains that support other favourite garden animals – the birds, mammals, amphibians and reptiles.



Cucumber spider.

Minibeasts are fascinating and beautiful creatures. Encouraging and studying them in the garden makes a real contribution to their conservation and is an educational – and highly enjoyable – pursuit that brings a wider understanding of how the living world works.

Food plants – minibeast restaurants and cafés

Many minibeasts eat the leaves, stems, flowers, even the wood of garden plants. Most simply make the odd hole in a leaf here and there, mine the occasional stem or suck a little sap and are not really a nuisance. Lots of attractive butterflies, moths, bugs and beetles take advantage of the plants in our



General purple and gold moth.

gardens and it's worth increasing the value of the garden to them by cultivating the plants they can use, while avoiding those that attract pests.

Native or not?

Most books on gardening for wildlife stress the need for native plant

species to attract insects. While this is sound, it's not necessary to fill your garden with wildflowers to encourage attractive plant-eating species. You can still be a plant enthusiast – or use most ordinary garden plants – and still have a host of interesting minibeasts in the garden.



Shield bug.

Many garden plants are closely related to our native wild plants and are equally acceptable as food plants, despite their garden pedigree and



Picture-winged fly.

showy flowers. Generally, the more similar a plant is to our native species' growth-form and leaf texture, the more likely it is to support plant-eating insects. Exotic plants, perhaps with thick waxy leaves, dense woolly hairs or strong-smelling foliage, are less likely to support many species, though there are often surprises as to who will eat what!

Generalists and specialists

Many plant-eating insects are 'generalists', feeding on a wide variety of plants, usually of a particular growth form. Some feed mostly on the foliage of shrubs or trees, others

on herbaceous plants, and some on grasses. Some minibeasts are, however, highly fussy, eating only a few or even a single species of plants.

For example, brimstone butterfly caterpillars feed only on buckthorns, which are rarely grown in gardens; and small tortoiseshell and peacock caterpillars and a host of other species, feed only on nettles.

Where a plant grows in the garden can be very influential. As a rule, more minibeasts prefer food plants growing in sunshine than in shade and plants at the very edge of the border or shrubbery are favourites.



Mullein moth caterpillar.



Peacock caterpillars on nettles.

Not every gardener wants lots of nettles and it's worth bearing in mind that the butterflies only use nettles in full sunshine. Keeping that nettle patch in the shady area behind the garden shed won't do – you will need to sacrifice a prime bit of sunny border if you want butterflies to breed on them. An alternative might be to check out the local area – there are usually patches of nettles around somewhere – and then persuade

the local authority to leave them for the butterflies.

It can be fun to grow a particular native plant (or a closely related species) that supports a wide variety of species and see what turns up. Good plants to try are bird's-foot-trefoil, verbascums, figworts, birches, willows and poplars (remember that the last two make sizable trees so be careful where you put them).



Peacock butterfly.



Figwort sawfly.



Flowers – minibeast bars

Probably the most valuable feature of gardens for the most numerous minibeasts – the insects – is an abundance of flowers.



Crab spider – these often 'mug' insect visitors to flowers.

After all, flowers evolved specifically to attract insects – nectar is many insects' main energy source and protein in pollen is vital in the production of their eggs. Regardless of what they eat as larvae, many adult insects visit flowers as their only source of food. Others use flowers as territory markers or meeting and mating places, or even lairs from which to catch other flower-visiting species. Some crab spiders, for example, 'mug' unsuspecting visitors, changing their colour to match that of the flower.

Example of good garden border.

What sort of flowers are best for minibeasts?

Open structures

Most insects are attracted to flowers with an open, flat structure that allows access to the nectar without the need for specialised mouthparts.



Soldier beetle.

Particularly valuable are plants in the rose family. The best roses are open-flowered, single varieties, but the family also includes hawthorns, crab apples, potentillas, and whitebeam (*Sorbus*) species including rowan, together with the various blackberry/raspberry (*Rubus*) species. The saxifrage family, such as saxifrages, heucheras and astilbes, the stonecrop family (ice-plant and other *Sedum* species), and umbellifers such as angelica, lovage, fennel (and bolted carrots and parsnips), are also

particularly good. There are similar structured flowers in many families and it soon becomes easy to get the 'jizz' of what is likely to be a good insect plant.

Tubes for bees

Tubular or bell-shaped flowers cater for a more specialised clientele. Snapdragons, foxgloves, penstemons, campanulas, ericas, and members of the pea and mint families such as broom, clover, lavenders, *Lamium* (dead nettles) and *Prunella* (selfheal) species are all excellent for attracting bumblebees, solitary bees and the domestic honey bee. While most bees also visit the more open flowers, some specialise in tubular flowers.

A mixture

Some plants mass together lots of tiny tubular flowers into one large bloom, providing a whole carpet of nectar sources, much loved by butterflies



Bumblebee on selfheal.



Thick-legged flower beetle on geranium.

and moths and many other insects. Buddleias, valerians, hebes, mints and marjoram, and the whole of the daisy family are excellent. Daisies provide an open 'landing stage' of petals and the central 'button' provides nectar over quite a long period. Especially valuable are achilleas, goldenrods, asters, and almost anything with the 'typical' daisy structure.

Beware of doubles!

Don't fill the garden with cultivars of 'double' flowering or 'flore pleno' varieties. While attractive, few of these provide nectar and pollen, and what little there is may be difficult for insects to get to amongst the mass of doubled-up petals.

Flowers through the year

Aim to provide a good variety of flowers throughout most of the year. Overwintering queen bumblebees,

drone flies, small tortoiseshell and brimstone butterflies rely on late-flowering Michaelmas daisies (asters), ice plants and ivies. On emerging in early spring, these same insects use early-flowering hellebores, narcissi, dornicums, viburnums and *Prunus* species such as the early flowering, cherries, cherry-plum etc (single-flowered varieties only – see above). Blackthorn is often not suitable for the garden as it suckers too much.



Nectaring insects on ivy.

A nectar surprise

Some garden plants provide nectar in surprising places – a cherry-laurel can swarm with nectaring insects, even when not in flower. Look carefully underneath younger leaves for 'extrafloral nectaries'. These are small green pads at the base of the leaf veins that attract ants, parasitic wasps and flies in particular, and help protect the plant from leaf-eating insects.

Cover – minibeast hide & seek

Most garden minibeasts need somewhere to hide at certain times, either to sleep, escape from predators or shelter from the rain or sun.

Cover is very important so don't be too tidy in the garden. Dense vegetation, tussocky grasses or sedges and plants with a 'rosette' of leaves that minibeasts can get beneath; all offer good retreats. Dead leaves, grass thatch, old seed heads and hollow

stems are all good hideaway places. Think 'minibeast' before tidying the dead material away and keep some throughout the winter.

Winter retreats

Many minibeasts hibernate, and cover is essential for them to overwinter successfully in our gardens. Stones, bits of wood, loose bark, fissured bark on older trees (the flaky bark of old apple trees is excellent) – anything that creatures can get into or underneath is valuable, as is a cool winter-time compost heap. Evergreens with tightly packed leaves or needles provide



Woodlouse spider and pill woodlouse.



Lesser marsh grasshopper.

overwintering places, as does a good cover of ivy on a wall or tree. Some minibeasts overwinter deep in the dead seed heads of flowering plants, so you can help them by waiting till late spring or even early summer before cutting seed heads back.

Some butterflies, moths, lacewings, ladybirds, droneflies, queen bumblebees, wasps and hornets seek out cool, undisturbed spots to pass



Hibernating herald moth.



Moulting centipede.

the winter. They may come indoors, to sheds, garages or unheated spare rooms. If disturbed, or they become too warm, they may wake and rapidly use up their energy reserves: if this happens it is unlikely they will make it through the winter. If you do need to heat somewhere that has overwintering minibeasts, try moving them to another cool, protected location, disturbing them as little as possible.

Hot-spots – minibeast sun-bathers

Minibeasts are, almost without exception, 'cold blooded'. This does not mean they work at lower body temperatures than us – some actually have a higher temperature than we do. It means that they cannot generate their own body heat like we do and they must get their body heat from external sources, usually from



Wolf spider with egg ball.

sunshine. Little warm spots in the garden are therefore vital for minibeasts. They need not be very large – but they are very important.



Bare soil and stone is a habitat in its own right.

Sun-baked bare surfaces

Any bare ground, rock or wood in full sunshine rapidly warms up and may be 10°C hotter than areas with plants. Bare soil in the vegetable patch, concrete paths, rockery rocks, house or shed walls – especially when facing roughly south – are regular sunbathing spots for minibeasts that need to warm up before they can get on with their daily lives. Particularly useful are those that warm up quickly in the morning, allowing minibeasts an early start. Other predatory minibeasts take advantage of these sunbathers. These predators are fast, have prominent jaws and large eyes with good 3-D vision. They are the big cats of the minibeast world – a stealthy approach followed by a fast dash across an open space to catch unwary prey.



Basking ruby-tail wasp.



Ground beetle.

Sun-traps

Other useful hot spots are sun-traps within the shrubbery or herbaceous border, especially if amongst nectar flowers. Gaps or indentations along the edges, especially south-facing ones, create shelter from cool winds.

Try and make sure that the garden offers plenty of little hot-spots throughout the day in a variety of situations. These are often the best places for minibeast watching.



Basking red admiral butterfly.

Deadstuff – minibeasts and decay

Minibeasts are nature's 'clean-up gang', working with fungi to clear away dead plants; everything from fallen leaves to tree trunks, and return them to the soil. A well-made compost heap teems with life and is excellent for minibeast watching.



Woodlouse.



Devil's coach horse beetle.



St Mark's fly in compost heap.

Leaving dead plant material to decay away naturally greatly increases the diversity of creatures in your garden. If you find it unsightly, hide fallen leaves and plant litter into 'habitat piles', but try and leave some where it lies on the soil.

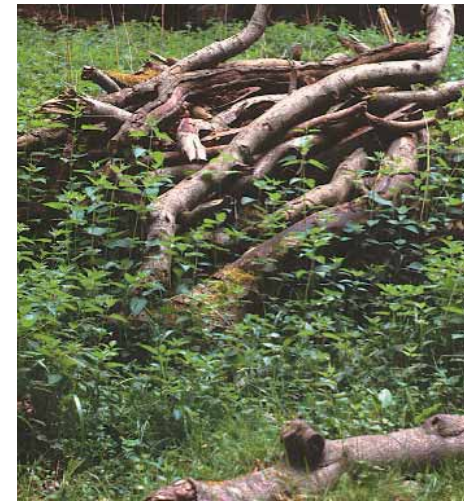
Dead wood

Decaying dead wood attracts a whole suite of minibeasts, often highly colourful, especially beetles and hoverflies. Some use dead wood while it is still attached to the living tree. Unless actually diseased (which is not the same as decaying!) there's usually no need to remove this dead wood unless it's likely to be a safety hazard when it eventually falls.

Exit holes of wood-boring beetles are often used as nests by solitary bees, as well as small solitary wasps that stock their nests with aphids, plant-hoppers or weevils. Related species nest in broken hollow plant stems.

Fallen wood lying on the soil is usually damp, with active fungi, and may be home to minibeasts such as lesser stag, rhinoceros and longhorn beetles. In the south, there may also be the huge stag beetle itself – a species for which England is internationally important and which is a frequent garden inhabitant.

You can make special habitat piles of dead wood for these species. Big is beautiful – go for branches or trunks in preference to twigs. It's best to site these at the edge of a shady area or in dappled sunshine (but not in full sun) to get a good balance of warmth and moisture – it should never be allowed to dry out.



Habitat pile of dead wood.



Lesser stag beetle.



Little mournful wasp outside its burrow.



Wasp beetle.



The garden pond – minibeast beach, pool and watering hole

A garden pond hugely increases the attractiveness of the garden for minibeasts. Even a very small water body will very quickly bring additional species. However, do try and make your pond as large as you can (while keeping it safe if you have young children). The larger the pond, the greater the variety of different minibeast microhabitats there can be.



Doli fly.

The pond edge

Go for an edge that provides a mixture of cover and open ground. Positioning plants so that those in the water gently mingle with those in a neighbouring border allows

A good garden pond. Sue Ellis



Water beetle.

minibeasts to come and go in safety, while open areas allow them to sunbathe and hunt. Try to keep small, gently-sloping muddy or sandy 'beaches' free of plants. A host of small creatures will use them to sunbathe and hunt over, including green 'doli' flies, ground and rove beetles and wolf spiders. Solitary bees and wasps may collect mud on these 'beaches' to cap off their nests.

If your pond plants are too rampant, then try making a beach out of coarse sterile shingle or gravel. Different minibeasts will live on that compared with those using sand/mud, so why not try both?

Pond plants

Go for a good mixture of floating, submerged and emerging species. Submerged plants with finely dissected (frilly) leaves such as milfoil, hornwort, starwort and water violet are good oxygenators and provide underwater cover and hunting grounds for aquatic minibeasts like water beetles, dragonfly larvae and water spiders. Floating plants also provide cover, prevent the water going green, and provide 'platforms' on which minibeasts can sunbathe, hunt and mate – and a few are good food plants too. Caterpillars of brown and white china-mark moths feed on various floating plants, and common waterweed *Potamogeton natans* is the food plant of an attractive bronze and silver 'reed' beetle.



Reed beetles.

Emergent plants – ones that root underwater but grow through the surface – are vital for minibeasts. Many pond-dwellers, such as dragonflies, damselflies, alderflies and mayflies, need an emerging stem that will let them climb out of the water before turning into adults. Evidence is easily found in the ghost-like empty skins of larvae sometimes found still clinging to emergent plants. The process of a larva moulting into an adult is fascinating to watch.

Beware of aliens!

Avoid invasive alien plants like parrot's feather *Myriophyllum aquaticum*, New Zealand pygmyweed *Crassula helmsii* (sometimes sold as *Tillaea recurva*) and floating pennywort *Hydrocotyle ranunculoides*. They may seem ideal as minibeast habitat but will take over your pond and all too easily escape into the wild, where they do incalculable damage to native wildlife habitats.

Water depth and fish

A pond doesn't need to be particularly deep for minibeasts. Indeed, shallow water is warmer and better for most species. Large areas of open water are far too hazardous for most species on the look-out for predators. Think before introducing



Alder fly.

fish as they reduce the numbers of minibeasts in the pond by eating them, and bottom-grubbers stir up the sediment, making the water cloudy. If there really is plenty of weedy cover in the pond, then minibeasts can just about cope with a few fish, but go for sticklebacks (which will help stop mosquitoes breeding in your pond), rather than goldfish, tench or carp.



Pond skater.

Pests – minibeasts we love to hate

A fairly small number of minibeasts gives the rest a bad name by eating the plants we like to grow in our gardens.



Large red slug.

A word in their defence...

Gardening books and pesticide adverts demonise pests as ravaging hoards of malevolent creatures, bent on destruction. But think 'minibeast' for a moment – they are just doing what comes naturally and taking advantage of lots of their food plants, grown close together, often varieties that we have bred to be particularly succulent or tasty. No wonder they move in and multiply – we've just provided their favourite restaurant so can we really blame them? Pests are really only species whose food plants we have chosen to grow, and this has led to conflict.

Learning to live with pests

There are, however, plenty of species of slugs, snails, caterpillars, aphids, bugs, flea beetles, weevils, chafers, wireworms, leatherjackets and many others that do make themselves pretty unwelcome, even to the most wildlife-friendly gardener. The trick is to work out what is tolerable – something that is likely to be different for each garden and gardener. A whole plant reduced to a stump is unlikely to be tolerated, but it's easy to train yourself to overlook the odd hole in the edge of a leaf or end of a shoot spun together with silk.

What about the really pesky pests? There are several options. The easiest is simply not to grow those plants that you have found to be especially vulnerable. For example, growing lots of hostas in a shady damp garden on clay soil is just asking for trouble from slugs. Planting 'cottage garden' style in a jumble of varieties is likely to reduce the effects of pests, whose numbers build up more easily in large swathes of a single species.

Chemical warfare – pesticides

It is easy to preach against the use of chemicals, and the fully organic garden is likely to be best for minibeasts. There are, however, occasions when pests do overstep the mark and even the keenest



Lily beetle.

wildlife gardener may wish to wage war against a particularly difficult outbreak. Try organic pesticides such as soft soap and plant-derived chemicals that are short lasting, though they are toxic to nearly all minibeasts – friend and foe alike. Whenever pesticides are used, always be ultra-careful to avoid any 'drifting' away from the target and killing harmless or beneficial species. In particular, avoid using chemicals anywhere near the garden pond, as aquatic species are especially vulnerable. It is possible to buy 'biological control agents' to reduce pest numbers, though most work well only in confined places such as greenhouses.

Wasps and bees

The black and yellow social wasps that can sting are a mixed blessing.

They are valuable predators of many pest species but are also sometimes an intolerable (and sometimes dangerous) nuisance to our enjoyment of the garden. Whether to live with a wasps' nest in the garden or to get in professional

help to eradicate it (never try it yourself) is an individual choice, depending on the position of the nest and the danger to people and pets.

Bumblebees and solitary bees (and domestic honeybees) are far less aggressive, and gardens are now important habitats for them. Only consider having a bumblebee nest removed if it is very close to a children's play area.



Queen dark wasp.

Beneficial species – minibeasts we should love

Rather than using pesticides, try to control pests by making your garden 'predator-friendly'.



Seven-spot ladybird.

Ladybirds, lacewings and hoverflies eat aphids. Ground and rove beetles tackle slugs and caterpillars, while various spiders and parasitic wasps and flies limit the numbers of most other minibeasts. Providing cover and nectar sources encourages predators and parasitic species to live in the garden and cuts down the numbers of pests.



Brown lacewing.



Home for mason bees. Deb Proctor

Minibeast homes

By far the best way to encourage minibeasts to live in your garden is to garden for their needs, providing cover, nectar, decaying plant material and nesting sites.

You can also, however, buy – or better still, make – structures to encourage them to stay in the garden. There are artificial bumblebee nests, a bit like inverted ceramic plant pots, which can be stuffed with soft dead grass for nesting material. A piece of wood drilled with variously sized holes makes nest sites for solitary bees and wasps, as does a series of hollow bamboo tubes crammed into a frame, mimicking the ends of broken stems. There are also ladybird and lacewing 'hibernacula', similar to bird boxes, where they (and other species) can safely pass the winter. Some of these work better than others and don't be too disappointed if the local bumblebees ignore your customised home and move in under the garden shed!

Pleasure from minibeasts – studying them in your garden

Being right on the doorstep – sometimes literally – means that minibeasts can be studied much more closely than larger animals.



Sexton beetle.

They can be watched going about their private lives in the garden, or brought indoors in transparent tubes or bug boxes to be studied with a magnifying glass. The Naturalists'



Minibeast spotting.
Paul Glendell/Natural England



Mother of pearl moth.

Handbooks series (Richmond Press) gives ideas for activities on a wide variety of invertebrate groups, from ladybirds and ground beetles to animals under stones and logs, and insects and nettles.

Standing by an outside light on a warm, muggy, moonless night to see what turns up for a couple of hours after sunset is an effective way of finding nocturnal minibeasts you would not usually encounter. Lots of moths, lacewings, caddisflies, beetles, craneflies, ichneumon wasps and many more night-flying insects will turn up. Ground beetles, harvestmen, orb-web and jumping spiders will also emerge to capture prey that has been attracted to the light.

Minibeasts in the garden provide an endless source of fascination for young and old. What better way of imbuing an interest and respect for the living world than by encouraging children to satisfy their innate curiosity and enthusiasm for life by studying them?

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Hoverfly on Californian poppy.

Further information

This is one of a range of wildlife gardening booklets published by Natural England. For more details, contact the Natural England Enquiry Service on 0845 600 3078 or e-mail enquiries@naturalengland.org.uk

Natural England also produces *Gardening with wildlife in mind*, an illustrated wildlife reference. Originally on CD but now also available on-line, *Gardening with wildlife in mind* has detailed information on 800 plants and animal species often found in our gardens, and shows how they are ecologically linked. See www.plantpress.com



Ivy provides food and shelter for many creatures.

Other titles

Minibeast identification

There are thousands of species that might turn up in the garden, and no single guide can ever be adequate. A good start is the Collins Field Guide series, which has volumes on insects, spiders and molluscs and freshwater life. Another is:

Chinery, M. *Insects of Britain and Western Europe*. A&C Black. 2007.

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