



Minibeast Fact File

The official term for a minibeast is an invertebrate. This means an animal with no backbone. In Britain there are over 25,000 species of known invertebrates. Unlike vertebrates they do not have a skeleton inside. This makes them soft and bendy and because of this some, such as snails, have shells to live in, whilst others such as spiders and insects have a hard outside covering called an exoskeleton.

Animals with no legs

Earthworms

There are up to 20 worms to the square metre in the average garden. Their bodies are divided into distinct segments. They live mainly in the top 25cm of soil although they can retreat to lower levels in very cold or dry weather. Most species remain active throughout the year and move (with the help of bristles and body fluids) by expanding and contracting their muscles.

As worms do not have respiratory organs, they breathe over the entire body surface, which must be kept moist at all times.

There is no real head and there are no eyes or other special sense organs, although the whole body is sensitive to light and to vibrations. The mouth is right at the front.

In mature worms a small region swells up to form the clitellum (saddle) which plays an important part in reproduction. Worms are hermaphrodite (having both male and female sex organs) but need a partner to reproduce. Both worms will then produce eggs which hatch after several weeks.

The number of body segments varies according to species, age and size. All but the first and last segments have four pairs of bristles in the lower half. These play an essential role in movement and anchor the worm in its tunnel when necessary.

Worms tunnel either by excavating with their mouths and swallowing the soil or by forcing their way through soil particles. Organic matter is swallowed with the soil and undigested mineral matter is emitted from the hind end. This is deposited near the surface and the minerals are washed back into the soil to the plant roots by rainwater. The worms' tunnels also help to aerate the soil and maintain good drainage. By dragging dead leaves into their burrows at night to eat they are further enriching the soil.

The worm's main enemy is the mole. The moles catch and store large numbers of worms (about 25 a day) biting the head ends off to prevent escape. As the worms are not killed they do not rot away. If left they eventually regenerate the front end and crawl away.

Birds are their enemy above ground. Birds can hear them tunnelling and plunge their beaks in to catch them. Worms use their bristles to anchor themselves into their tunnels. Often their bodies will snap before the bird can drag them out, if only a few segments are lost at the front or back the worm can survive. Other enemies are shrews, hedgehogs and badgers.

Snails and Slugs

Snails have shells into which they can withdraw for protection and are most numerous in chalky areas as calcium is needed in the formation of their shells. In lime-deficient areas the same species may have thinner more brittle shells. The shell is secreted by the mantle (a thick cloak of skin covering the part of the snail permanently inside the shell). As the snail grows, new shell material is continually added and growth lines can be seen. Shell growth stops at maturity.

Slugs are merely snails that have lost their shells during their evolution. In slugs the shell is reduced to a thin plate hidden beneath the mantle. Although they don't have the protection of a shell they are able to squeeze their soft flexible body into small spaces for protection.

They have four tentacles on their heads; the front ones act as feelers and have organs of smell, the back ones have eyes at the tips. Snails and slugs creep along the ground on one long flat muscular foot which produces slime to help them move leaving a trail. The slime also protects the animals from sharp objects and serves as an adhesive when climbing.

Slugs and snails are mainly seen at night. They like damp conditions as they lose body moisture very easily. In the day they tuck themselves away in secluded spots, often using the same resting places day after day, coming out to feed after rain. In really dry weather the snail will seal itself up into its shell with a layer of mucus which hardens to make it waterproof. It can stay in this inactive state for several months. In dry conditions slugs generally burrow into the ground. By remaining still slugs can quickly regain any lost moisture.

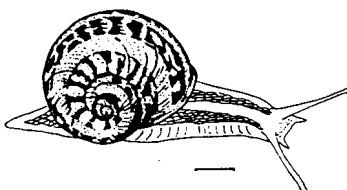
In winter the snails hibernate by closing themselves up in their shells and sealing up the opening. Most hibernate in the soil or well hidden cracks in rocks or under stones.

They feed mostly on living plants but some also feed on plant detritus. Slugs and snails feed by rasping their food with a ribbon-like tongue called a radula. This is covered with thousands of minute teeth and acts like sandpaper.

Snails and slugs are hermaphrodite each snail having both male and female parts. After mating both snails produce eggs. In most species the young hatch directly from the eggs.

The main enemy of the slug and snail is the song thrush who grips the lip of the snails shell and brings it down on a hard place known as the anvil, to break the shell. They are also eaten by hedgehogs, frogs and toads. Slugs are also eaten by ground and rove beetles.

Most hedgerow and garden snails are banded as this provides the best camouflage in the 'broken' vegetation of these habitats. Predation by birds aids the removal of snails unsuited to their habitats.



These invertebrates will always be insects, having three body parts (head, thorax and abdomen). All winged minibeasts are insects but there are wingless insects!

Earwigs

Earwigs are recognisable by the pincers at the end of their body. These are almost straight in the female but strongly curved in the male. By raising them forward over the body like a scorpion's sting they are used for defence, mainly against shrews and although if pinched we would feel it, it wouldn't hurt.

Although they can fly, earwigs do not do so very often. The front wings are small leathery flaps behind the head and the hind wings, which are large and used for flying. These are elaborately folded (up to forty layers) beneath them.

Earwigs are true omnivores although mainly scavengers hunting mainly by night and hiding in crevices by day, especially in loose bark. They particularly like petals.

The female earwig is a very attentive mother. After mating in the summer she hollows out a chamber under a log or stone at the first frost. During the winter she will lay her eggs and guard them lovingly, licking them to keep them clean. If they are scattered she will collect them up again. When the eggs hatch in the spring the brood is protected and even fed until the young are ready to look after themselves. There are usually four moults.

There are various theories as to how the earwig had got it's name. Some say it is the ear shape of the hind wings. Another theory is that the pincers are shaped like the instrument once used for ear piercing, but it seems most likely that in the days of straw mattresses and thatched roofs the name comes from the insects' interest in the ear as a resting place!

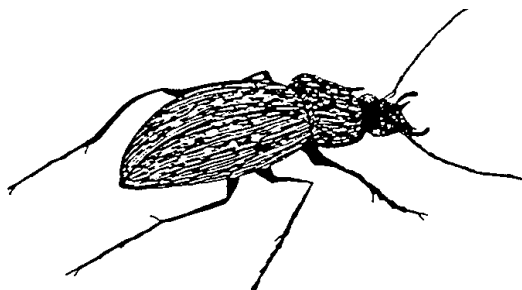
Beetles

All beetles have biting jaws and tough front wings meeting in a line in the middle and forming a protective sheath to cover the flimsy hind wings if present.

All beetles begin life as eggs and then pass through a larval and pupal stage as they grow up.

Ground beetles are nocturnal, sleeping under logs and stones by day. There are many different types, few of them fly and most don't even have any hind wings. They are mainly carnivores but will sometimes eat fruit and vegetables as well. They are particularly fond of slugs.

The devil's coach horse is a **rove beetle**. It is a scavenger and predator and when alarmed turns to it's attacker and raises it's rear end. At the same time it opens it's jaws and releases a pungent secretion from it's abdomen.



Spiders

A spider's body is clearly divided into two parts and both parts are usually hairy. The front part has the four pairs of legs and the palps which are often mistaken for antennae. The palps help the spider to smell, taste and feel. In front of the palps are the fangs which are connected to the poison glands. All spiders are predators and use their poison to paralyse or kill their prey. Most spiders have sharp teeth at the base of each fang which are used to shred and grind the prey. Digestive juices poured out from the mouth convert the crushed material into soup which the spider sucks up. Most spiders have eight eyes but still don't see too well, relying on scent and touch.

Silk is produced by glands in the spider's abdomen and emerges through three pairs of spinners just under the tip of the body. The silk is drawn out by the legs. It is liquid to start with but solidifies to thread as soon as it is stretched. The spider has a different type of silk gland producing different types of silk for different jobs i.e. one for drag lines and another for wrapping.

Although they all make use of silk, not all spiders spin webs. When they do they differ according to the species. The spider web, generally takes under an hour to build. It contains a sticky spiral to catch the prey with a non-sticky central platform on which the spider can rest. The web is rebuilt every day or two even if it is undamaged as the sticky gum becomes coated with dust and is less effective.

Vibrations inform the spider that something has landed in the web. Small victims are bitten immediately whilst larger ones are wrapped in silk before being bitten. The prey is then taken away to be eaten or left until later. Spiders will eat most types of insect.

The males court the females by strumming her web. As the males are smaller than the females they are sometimes eaten after mating although most escape due to their small size and agility. The female lays her eggs and then spins a protective mantle of silk around them. Some spiders carry their cocoons round with them. Hundreds of babies emerge from each egg sack but many will not survive as they leave the mother straight away. The babies of some species let out threads of silk and drift through the air. All spiders must undergo several moults before they are mature.

Birds are the spider's greatest enemy along with other spiders!

Harvestmen

These are named because they mature and become obvious at harvest time. They are not spiders and differ from them in several ways. Their body is fused in to one segment. Their second pair of legs is longer than the rest and they only have two simple eyes perched on a little turret on the top of the body. They are largely nocturnal and find their way round by scent and touch, using their palps and the sensitive tips on their second pair of legs. They also have no silk or venom but are carnivores using small pincers to tear and eat spiders, centipedes and caterpillars.



Woodlice

Woodlice have fourteen legs. They need to live in damp conditions and are generally active at night. Their bodies are covered with overlapping horny plates which are not waterproof and so the woodlouse cannot survive for long in dry weather as they lose too much water. As well as the fourteen walking legs there are five pairs of breathing legs which act like gills if covered in a film of water. At the rear end is a pair of forked limbs which have a sensory function and secrete a repellent fluid to deter predators.

The woodlouse known as the pill-bug can roll into a ball which helps it to reduce evaporation and gives some protection against predators.

Woodlice feed mainly at night. Their food consists mainly of dead and decaying plant matter including rotting wood.

The female carries her eggs in a special sack under the front half of her body. As they grow the woodlice moult in two stages, the rear half first, followed by the front half.

Shrews are the main predators of woodlice but they are also eaten by toads, ground beetles, centipedes, harvestmen and spiders.

Centipedes

The centipede is nocturnal and can be found under logs and stones. They lack waterproof coats and have to stay in damp spots by day. They have many body segments and their body is flattened from top to bottom. They have only one pair of legs per segment and are fast moving.

The name centipede means one hundred feet but none has exactly this number. The last pair of legs is longer than the others and has a good supply of sense organs, useful for travelling backwards into crevices. The true antennae at the front are very long and are loaded with sense organs which is useful as many centipedes have no eyes.

The centipede has curved fangs, which are hollow and used to inject poison. They eat most other minibeasts in the garden. In their turn centipedes are eaten by birds, shrews, toads, ground beetles and hunting spiders.

There are two common types of centipede. Firstly the soil dwellers, often incorrectly known as wire worms (which are actually the larva of click beetles). They are thread-like, have short legs and are slow-moving for centipedes, both features associated with life in the soil. They are also amazingly flexible due to their large number of segments.

The second type of centipede is the stone dweller. These are the familiar reddish-brown centipedes found under logs etc. They are broader and less flexible than the soil dwellers with longer legs less suited to burrowing. They feed at night and rest in crevices in the daytime, liking both the upper and lower body surfaces to be in contact with something. Adults have fifteen pairs of legs, each pair being longer than the pair in front. This allows them to move quickly without treading on the toes in front!

They rely mainly on smell and touch as they only have simple eyes. Stone dwelling centipedes scatter their eggs in the soil after coating them with mucus and soil particles for protection, other garden dwellers lay their eggs in chambers in the soil and coil around them until they are hatched. The stone dwellers are born with six pairs of legs but acquire further legs with each moult.

The millipede is nocturnal. They are slow-moving herbivores and scavengers, having two pairs of legs on each segment. They are usually black and have a round body shape than the more flattened centipedes. Millipede means a thousand feet but no millipede has this number. The legs move in groups producing a ripple effect, propelling the animal forwards. Most millipedes live in the soil or leaf litter and are most numerous in chalky soils where the calcium helps to strengthen their outer coats.

Millipedes are mainly scavengers, feeding on all kinds of dead and decaying vegetable matter and also small amounts of dead slugs and worms.

There are three main types of millipede, snake, pill and flat-backed. The snake millipede is often shiny black with a rounded body shape which they coil into a spiral when at rest.

The pill millipede has a short fat body like a woodlouse but it has more legs and a broad shield at the hind end. It can roll it's body into a ball to give itself protection from water loss as well as enemies.

The flat-backed millipede appears more flattened than the others rather like the centipede but with two pairs of legs on each segment.

To repel their enemies the snake and flat-backed millipedes have poison glands on the sides of their bodies. When alarmed these secrete an unpleasant substance which can stain your fingers if you pick one up. Their main enemies are toads and birds.

After mating the female flat-backed millipede builds a nest for her eggs, these are dome-shaped and attached to stones in the soil. She coils around the nest and remains on guard for a week or so. The pill millipede makes no nest. The young are born with only three pairs of legs acquiring more legs and segments with each moult.

