

Introduction to spiders

Spiders are fascinating invertebrates found in a diverse range of habitats - from the inside of our homes to the tops of mountains. There are approximately 670 species of spider in the UK in 38 families - over 440 of these have been recorded in Scotland (from at least 28 different families).

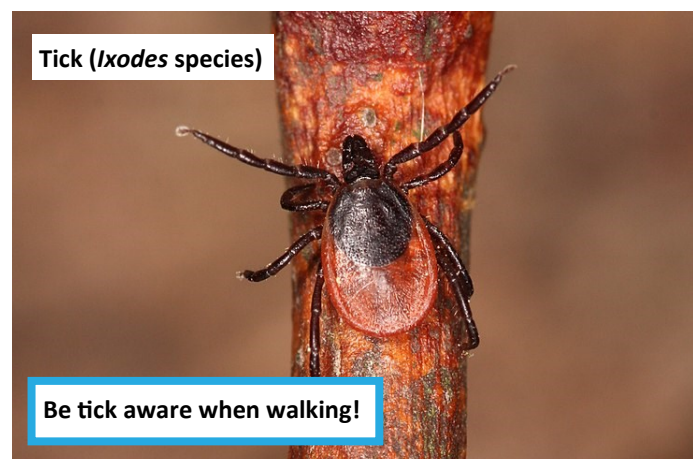
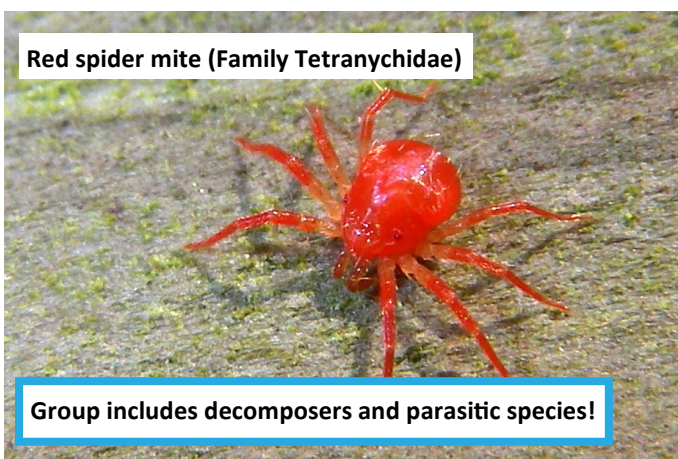
Spiders native to the UK have a great range of body sizes - from the tiny Minute maro money spider (*Maro minutus*) to the huge Cardinal spider (*Tegenaria parietina*) with a leg span of more than 10 centimetres. The Four-spot orbweaver (*Araneus quadratus*) is one of our heaviest weighing up to 2.5 grams!

Spiders play an important ecological and environmental role controlling many insect pest species. Without them there would be more flies in your house and insects damaging our crops!

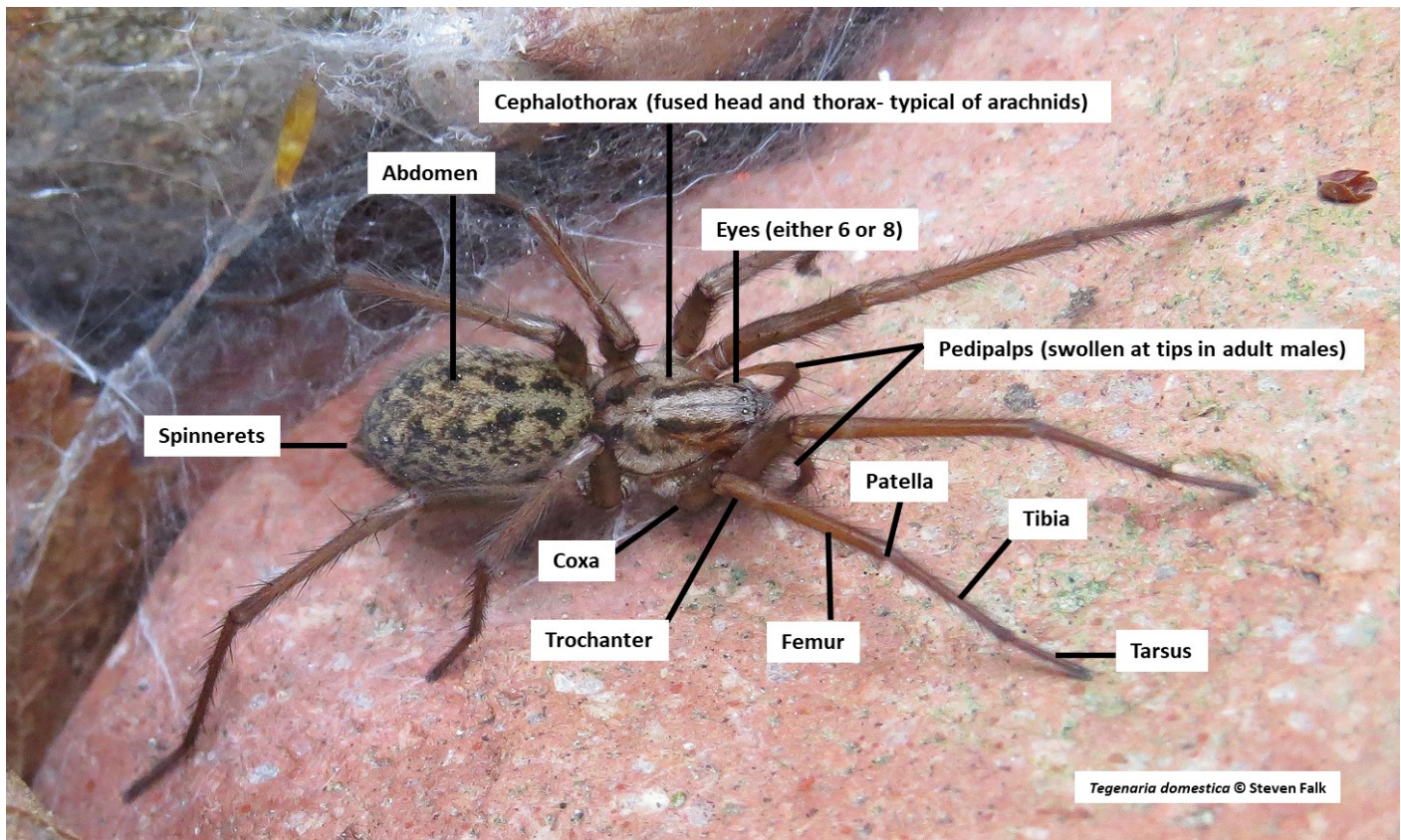
Spiders and their relatives

Spiders are arachnids and classified in the invertebrate Order Araneae. Arachnids not only include the spiders but also harvestmen (Order Opiliones), scorpions (Order Scorpiones), pseudoscorpions (Order Pseudoscorpiones), ticks (Order Ixodida) and mites (Order Acari).

Almost all adult arachnids have four pairs of legs unlike adult insects which all have three pairs of legs. Arachnids have two further pairs of appendages, the jaws (chelicerae) which are adapted for feeding and defence and the pedipalps which have become adapted to aid in feeding, movement and reproduction.



Spider anatomy



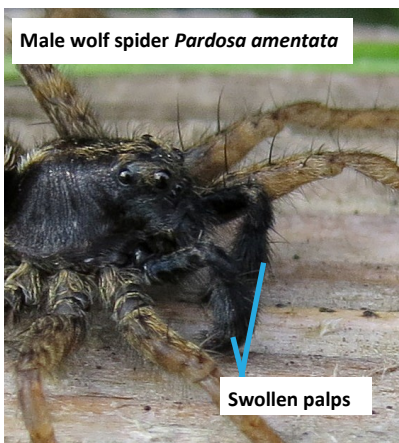
Identifying male and female spiders

Mature male and female spiders of each species have a unique and complex genital structure. Mature adults are often seen in autumn when males become more active looking for females to mate.

Males – tips of pedipalps swollen in mature males and have complex structure to pass sperm to the female's epigyne. Watch out for immature males which have smooth swollen pedipalps and no hint of structure.

Females – the epigyne of mature females is only revealed after the final moult as a complex feature at the top of the underside of the abdomen. Not seen in immature females except sometimes a hint of the structure.

Male wolf spider *Pardosa amentata*



Swollen palps

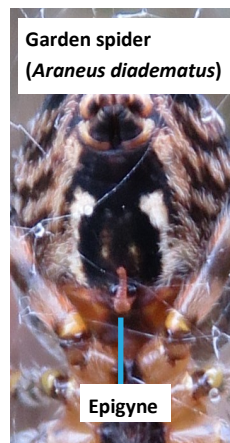
© Steven Falk



Mature palp of *Pardosa amentata*

© Bernard A. Huber

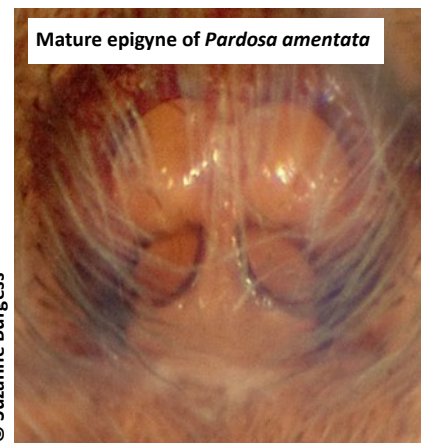
Garden spider (*Araneus diadematus*)



Epigyne

© Suzanne Burgess

Mature epigyne of *Pardosa amentata*



© Arno Grabolle

How do spiders hunt?

Spiders in the UK are all carnivorous, feeding on other insects and even other spiders, sometimes scavenging on already dead items! Spiders use different techniques when hunting for prey – they either spin a web to catch flying or passing prey, or they actively hunt and will sit and wait or stalk their prey.

When spiders catch their prey they inject them with venom through the fangs of their chelicerae, this venom kills the prey. Some spiders go on to wrap their prey item in silk to feed on later. Spiders aren't able to feed on solid items so need to reduce their prey to a liquid soup before feeding – they do this by secreting digestive juices into their prey. Species of *Tegeneria* (larger house spiders) have teeth on their chelicerae that they use to mash up solid prey items while adding the digestive juices to break it down, they are then able to suck up the mash they have created!

Active hunters

A large number of our 670 species of spiders don't use a web to catch their prey but use more active techniques, they include the wolf spiders (Lycosidae), ground spiders (Gnaphosidae), crab spiders (Thomisidae), jumping spiders (Salticidae) and woodlouse spiders (Dysderidae). Many of these have good eyesight, are fast runners and locate prey by detecting movement.



Zebra spider (female)

Jumping spiders have four large forward facing eyes and stalk their prey– when they are within reach they jump.

© Steven Falk



Wolf spider (female)

Wolf spiders have four large eyes and long legs for running using speed and strength to overcome prey.

© Steven Falk



Xysticus species with soldier beetle

Crab spiders wait on flowers for passing prey– they can over power insects much larger than themselves!

© Darren Bradley



Dysdera species with woodlouse

Woodlouse spiders are nocturnal hunters with long legs and large forward projecting chelicerae to catch prey.

© Roger Key

Spider silk and its uses

All spiders produce silk from either two or three pairs of spinnerets at the rear of their abdomen. Silk is produced as a liquid protein in the spider's abdomen which solidifies to form threads - it is incredibly strong, flexible and elastic. By changing the speed at which silk is drawn from their spinnerets, spiders can create threads for different purposes - to create a web for catching prey, to create a retreat either in vegetation or a hole in a wall where they can wait for prey or guard eggs (see image on right) or females use silk to wrap around their eggs so she can carry her egg sac.



A female Four-spot orb weaver (*Araneus quadratus*) in her silken retreat

© Suzanne Burgess

Spider webs

A small number of spiders make webs to catch prey. Although some are characteristic in shape and design it may not always be possible to identify the spider family from the web. Here are a few to look out for!



Orb weaver web

Created by long-jawed orb weaver (Family Tetragnathidae) and Orb weavers (Family Araneidae)

© Roger Key



Sheet web

Created by money spiders (Family Linyphiidae) and lesser cobweb spiders (Family Hahniidae)

© James K. Lindsey



Tube web

Created by laceweb spiders (Family Amaurobiidae) and *Tegenaria* species of funnel web (Family Agelenidae)

© Roger Key



Funnel web

Created by funnel web spiders (Family Agelenidae)

© Suzanne Burgess

Egg sacs and spiderlings

Female spiders are caring parents! After they lay their eggs, all females wrap them in silk from their spinnerets creating an egg-sac. This protects the eggs from drying out, but also from predators and parasites. Female spiders will then guard this egg-sac either in a silken retreat or by carrying it until they hatch.

On hatching, young **spiderlings** are similar in appearance to their parents— they grow by moulting their skins (known as **ecdysis**). The number of moults from when they hatch from the egg to becoming an adult varies between the different species.

Some female spiders will care for their young by carrying them on their backs or by creating a nest for them.



© Suzanne Burgess



A female Nursery web spider (*Pisaura mirabilis*) carries her eggs sac under her abdomen and looks after the spiderlings when they hatch

© Steven Falk



A female wolf spider carrying her young spiderlings on her abdomen

© Suzanne Burgess

It is important that spiderlings disperse from their other siblings to reduce competition for food and space. For those cared for by females this dispersal will be once they have reached a specific size. Spiderlings disperse using two different mechanisms that both involve silk:

- **Ballooning** - where the young spider moves to a high point and lifts its abdomen into the air and a strand of silk is drawn by the breeze from the spinnerets.
- **Rappelling** - this relies on the strand of silk getting snagged on vegetation where the spiderling can use it as a bridge to cross to a new area.

Sometimes when a large number of spiderlings disperse at the same time and land the silk strands combine and form **gossamer** across the vegetation as can be seen in the image below.



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