Mature male Ladybird Spider

The fall and rise of the Ladybird Spider in Britain

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The spider and its world – can a spider be cute?

One of our rarest spider species, the Ladybird Spider (*Eresus sandaliatus*) is also one of our most colourful… sometimes.

In Britain, Ladybird Spiders live on dry heaths, which are often very hot in summer and quite exposed to wind, rain and cold in winter. On these heaths, heathers (*Calluna* and *Erica*), up to about knee-height, are scattered across the seemingly miniature landscape a bit like trees and shrubberies in a park. Beneath and around them, like meadows, are carpets of mosses and lichens. Most of the time, both male and female spiders are a fine satiny grey or black, and furry rather than bristly. Those bristly, fast running and long-legged spiders have a lot to answer for! They give all spiders a bad, disgusting or scary reputation. It makes no sense to me because giraffes, cheetahs, orangutans and

Ladybird Spider tent amongst heather, moss and lichens

flamingos have long legs, and hedgehogs and walruses have bristles. But Ladybird Spiders could hardly be more different whilst still being spiders. They have teddy bear faces (in my opinion), teddy bear fur, comparatively short teddy bear legs – eight of them of course (but who's counting?) and they don't do much running around. They live for most of their lives in vertical burrows, which they dig to about the length of your finger, through their 4-year or-so lifespan. In a world where most invertebrates, and many spiders, complete their life cycle in about one year, that is quite a long life. I'm told it is probably the UK's longest-lived spider. Long life isn't always an easy thing though. Ladybird Spiders only breed at the end of their life and each female produces one batch of eggs, guarding her young until she dies; her entire life is spent in her web and burrow. That means surviving four years – four hot and/or wet summers, four cold and/or wet winters – woodpeckers, wasps and trampling deer and cattle, before they can breed. In human terms it would be like us having babies when we're pensioners. It can be risky to wait.

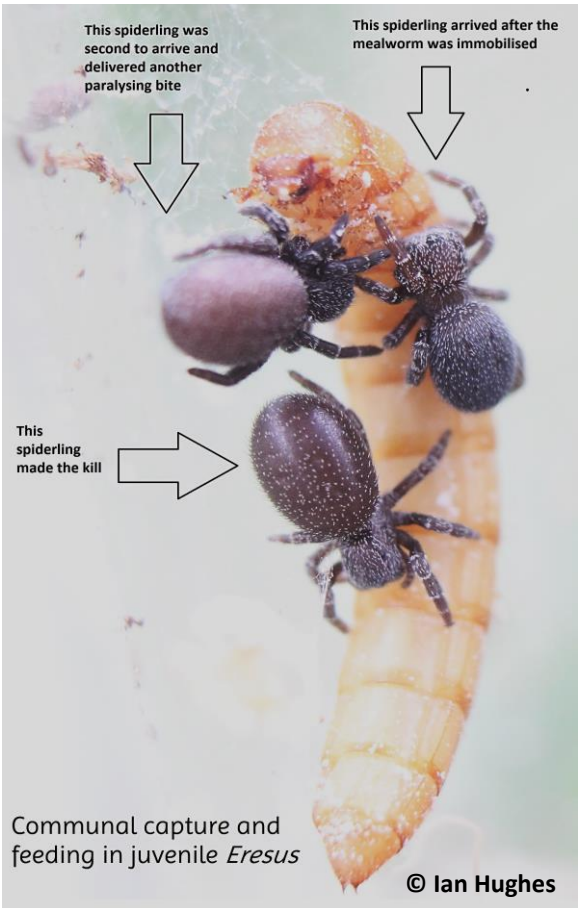
Spider 'mummies'

In mid-summer, a mated female produces 50 or so eggs (very few for a spider), wraps them in silk and seals herself into the low gazebo-like tent she started building as youngster. The tent covers the top of her burrow and protects her from birds whilst acting as a capture web. By sealing the edges, she transforms the tent into a chamber, which serves as her young's nursery room - and her tomb! When the eggs hatch, her cream-coloured spiderlings quickly scamper onto her back and rest in a cluster; it is really quite cute for a spider although some other spiders do similar things. Occasionally, they leave their group and trundle to Mum's mouth to feed on a special fluid (I'm going to call it spider-milk) which sort of dribbles from her mouth. This is their baby-food, their 'good start' in life. They moult from cream

Mature female Ladybird Spider

through chocolatey brown to satiny-grey/black, becoming speckly little replicas of Mum, and over time become a little less tolerant of each other, and a little hungrier. Steadily, the idea of eating each other becomes less and less unthinkable. Smaller spiders withdraw a little and keep to their own space, larger siblings become bolder and more intrusive. The playground at my school was a bit like that. The mother's dribbly 'spider-milk', together with her energy, runs out and she dies in the chamber with her young all around her. What a way to grow up is that - locked in a chamber with brothers and sisters who want to eat you and a dribbling mother who's dribble you drink until she dies? The orphans, now home-owners, spin lots of bluish silk within the nursery-tomb. This probably helps keep them safe from each other. They build climbing frames within the space but also coat their mother's drying body with silk too. She really is a mummy! She may even continue helping them after death as the 'aroma' of her body perhaps attracts more insects to the web. Rumours abound, although I've never seen it myself, that when her dribble runs dry, her children find other ways of draining her of her juices; like little vampires… one last family meal perhaps? I remember reading, as a child, with macabre relish, W. S. Bristowe's account in his Collins New Naturalist book, *World of Spiders*, of matriphagy by the distantly related Laceweb spiders (*Amaurobius* species). Perhaps, in the interests of promoting a positive image for spiders, we should keep that one to ourselves. What goes on in the web, stays in the web!

Growing up



Having once huddled cosily together on their mother's back, the spiderlings once delightful, silk-curtained nursery, is now a grimmer place. It's time to grow up. Like medieval royal families, most spiderlings seem to die in fights with their brothers and sisters, paying back nutrients to the family survival fund by being eaten. Don't try any of this at home! Others are driven to the margins of the web or out of it completely where they are more vulnerable to predators and less able, or unable, to take part in communal feasts. Communal feasts? Yes! Before they leave home, the spiderlings sometimes renovate their mother's tent into a capture web again, which they share. Prey that is too big for one spiderling to handle is attacked by the group who feed together quite contentedly when there is something big enough to go round. Did their mother set that up for them or is it all their own work? I think perhaps it's teamwork. All that building though, means that each spiderling has its own room (a little tube of silk) and they just share the dining room. It takes about a year before a spiderling starts digging a protective burrow of its own in the soil. Before that, they spin a silk tunnel through the moss and lichen that covers the soil around the web. In this mossy realm there are voracious predators – ants, tiger beetles, violet ground beetles as well as lizards and birds – to which the spiderlings can fall prey. They are also very vulnerable to being trodden on or scuffed

out of position by plodding humans and other heavy mammals. It's a tough place to grow up. Sticky tangling silk is a great defence as well as a great trap for prey. Most spider species scatter from the maternal web or egg case when they are old enough to fend for themselves. Ladybird Spiders, from what I've seen so far, prefer to build an extension – a silk tunnel – and stay in the same neighbourhood. This is why we find little villages of tents close together. I've not actually seen it, but I imagine that at some point a single spider dominates the original web or it is abandoned altogether (we do find large empty webs as well as large webs with single young spiders in them). Eventually, the young spiders cut themselves off from the communal area and rely entirely on their own webs. From here on, they're truly independent.

Life beyond the nursery

The lucky few who survive continue to dig burrows downwards and extend tent-like silk webs outwards. A large communal web is about 10 centimetres across. Insects blunder into the webs – the very same insects that eat spiderlings can also become prey with the skilful use of silk. Ladybird Spiders use a comb on their legs and a plate on their rear abdomen to weave silk that is woolly (cribellate). The hooks and spines on the legs of beetles and ants catch in this wool, detaining them for long enough for the spider to emerge from its burrow and nip the 'visitor' on the soft flesh between the joints of its shell-like casing. This is very much like finding a gap in a knight's armour and taking advantage of it in the worst possible way. Ants, beetles or bees, favourite guests to the tent, quickly slip into unconsciousness and are then sucked dry of their valuable juices. Ladybird Spiders don't like waste and use the undigested remains of their meals to decorate their webs. I don't think my Mum would have been very pleased with me if I had decorated my bedroom wall with bones, old apple cores and other bits of leftover food. So, I prefer to think of them as little furry museum curators displaying, with great pride, the things they have skilfully trapped and subdued, as prize exhibits on their well-maintained museum walls. These trophies could have a beneficial effect by attracting more edible visitors.

Ladybird Spider web with a variety of prey remains

It's different for boys

All that feeding makes Ladybird Spiders grow up. You've read about the female's life but what about the males? They live in a burrow beneath a tent for most of their life, usually maturing about a year before their sisters. In their second to last moult you can tell they are male because they develop bulb-like swellings on the end of their pedipalps. Wait a minute… moults and pedipalps what are they? If you're reading this, you'll probably know, but, as most people I meet don't know, you might find an opportunity to give them this to read.

Spiders, like other arthropods (scorpions, insects, lobsters, crabs) are protected by complex shelly armour called an exoskeleton. Like a knight in armour who's just eaten a very large pie, they run

Female (left) and male (right) Ladybird Spiders

into trouble when they need to grow because they are trapped inside that inflexible coat. They get over the problem by growing identical, but soft and stretchy armour underneath before splitting and crawling out of the old suit and then inflating to the desired size when they harden off a bit. This whole process is called moulting. Spiders have eight legs but 10 limbs. Smaller, and actually part of the mouth, are two extra little 'legs' called pedipalps which means 'foot-feelers'. Pedipalps, often shortened to 'palps', are incredibly useful to spiders as they not only feel but seem to be able to detect smells. In males they become like water pistols, which he fills with sperm in order to mate with females and fertilize their eggs. To me, they look like boxing gloves and he looks like he means business.

So, the male is still satiny black while his pedipalps are developing but, after about a year, he moults for the last time and emerges as dramatically as the ugly duckling who became a swan… no… more dramatically than that! His previously pure black legs are now white banded rugby socks, his black carapace becomes speckled with silvery white hairs and his formerly plain black abdomen is now a gorgeous deep red adorned with big black polka dots – or ladybird spots! Where he once was smart and elegant, he is now spectacularly glamorous and showy. He's clearly not dressed to live underground anymore; he's dressed to go out and it is only like this that Ladybird Spiders are seen above ground. And so he dares to leave his burrow and web, running across the heath, his pitch, with success as his goal; boxing gloves charged and ready. He's a bit of a sporty spider, isn't he? Some ladybirds taste horrible, and I think the mature male Ladybird Spider borrows the ladybird's look to stop predators from eating him while he goes from tent to tent in the hope of finding a receptive female. We sometimes find the remains of mature males in the decorations of the webs of mature females – what did she do?!

The fall

British Ladybird Spiders were first recorded in Dorset by scientists in the early 1800s with just a handful of sightings up to 1906, and then…nothing.

Heathland was being increasingly transformed from vast wilderness into fragments separated by roads, urban sprawl and farmland. The remaining fragments, unchanged for centuries, were now treated differently. The land was grazed too much or too little, over managed or under managed but rarely treated as it was in the old days and its plants and animals suffered as a result. Then things got worse. The First World War led not only to military ranges on heaths but the plantation of coniferous trees, mainly to ensure that the country never ran out of wooden pit props (used to stop coal-mine roofs from collapsing). A lack of pit props had slowed the coal mining industry, which was needed to fuel war time industries. Much of the heathland disappeared beneath dark shrouds of pine needles.

It looked as if the Ladybird Spider had become extinct on British heaths.

Rediscovery

There were claims of sightings after 1906 but none was ever proven until 1980 when Dr Peter Merrett (one of the top arachnologists in Britain) found a small population on a patch of heathland about the size of a tennis-court.

Peter discovered the population after invertebrate surveyors had found two spiders in pitfall traps, which they took to him for identification. He could hardly believe his eyes…they were Ladybird Spiders. By then it was winter and there was no chance of finding their webs. Peter waited until spring and then sprang into action and located what seems to have been their last refuge.

He immediately began trying to conserve them but because a plague of heather beetles was destroying their habitat the number of spiders was plummeting rather than rising. Peter collected wandering males and placed them nearer to the webs of females, operating what was effectively a spider dating service within the isolated population. It took 10 years for numbers to begin to pick up, having dropped to fewer than 10 webs.

The rise – return of the Ladybird Spider

In the early 1990s help arrived in the form of The Species Recovery Programme begun by the Government conservation agency (now called Natural England). My job in this was to try to breed the spiders in captivity, find out what they needed to survive and then attempt to settle new populations in new places. Setting up more populations was essential because a fire or disease or, as it turned out, a plague of heather beetles, could easily eradicate the spider from its one known site.

Mature male Ladybird Spider in translocation bottle

I found that the best method was to capture spiders and place them in new burrows I'd made with a pencil in tiny little gardens made in escape-proof tubs. They were mobile homes for spiders…with gardens. Wouldn't it be funny if caravans rumbled along the motorway complete with gardens as well? This may sound very posh and technologically advanced, but it was done with plastic water bottles, which I cut into three sections and filled with soil topped with the miniature moss and lichen garden. When the spiders had built good webs, their tubs were buried in the ground at the new heathland site we'd chosen. The top sections of the bottles (having completed its job of keep the spider in) were removed – a bit like Apollo rockets, if they'd been made by Blue Peter rather than NASA, with the spiders arriving at their new homes in their own capsules. The spiders did the rest. After a long and agonising wait and lots of worry it worked.

Since 2001, with the many members of the Ladybird Spider conservation partnership, we have made 22 translocation attempts on 11 separate heaths, resulting in 16 new populations that have produced juvenile spiders. At the time of writing, at least 10 populations have expanded in range

Web in uncapped translocation bottle

and six of the introduced populations have produced enough spiders for further translocations. Whilst it is very satisfying to see introduced populations thriving, it tends to be the ones who don't do so well that teach us the most important lessons. It emerged that the spiders dispersed mainly to the south of their new locations, and so suitable habitat had to be available in that direction. Shade from nearby conifer plantations, particularly during the cold, dark winter months, had to be avoided; spiders forced to relocate because of this ran the gauntlet of predators, including the ants with which they normally coexisted happily. Although grazing is great for creating a patchy mosaic of heath and was almost certainly what maintained most of the old, wild Ladybird Spider habitats, it also emerged as a problem for our very tiny, new populations of spiders. An immediate and drastic decline from hundreds to fewer than ten webs followed the introduction of cattle grazing at one introduction site, just over a hectare in extent. The most obvious culprit was cowpats. You've heard of the smoking gun, well, this was the steaming dung! On investigation it turned out to be more complex. Although some webs were buried under dung, others were damaged by hooves. The dung was slow to decompose and grasses and herbs which germinated from seeds within it took hold in the precious open patches amongst the heather, denuding them of mosses and lichens. Fortunately, these are not insurmountable problems. We are continually finding out more. Most of my time seems to be spent finding out that what I was almost sure of… was wrong, but it is a rewarding type of humbling. I'm reminded of the yarn of the alleged arachnophile Robert the Bruce, and the proverb attributed to him. "If at first you don't succeed, try, try, again."

To help to fund work on Ladybird Spider conservation and to learn more about them, you can buy our book **Lacey the Ladybird Spider** at https://lifeformsart.co.uk/.

Lacey the Ladybird Spider **by Ian Hughes**