

How to study spiders and their relatives



Advancing Arachnology



Richard Galton



Esther Oxford

Dendryphantès rudis - an attractive jumping spider found recently in a park in Liverpool. Spiders new to Britain turn up in surprising places.



Richard Galton

Spiders can be found almost anywhere, but how can you discover more about these fascinating animals?

Whether you want to study spider behaviour, learn about their ecology or just create a species list for your local patch, this leaflet provides guidance on how to get started. Similar approaches can be used for spider relatives, the harvestmen and false scorpions.

HOW TO WATCH ARACHNIDS

Around the house

Spiders can be observed easily in their natural habitat; your garden, shed or house are likely to have several different sorts. Many spiders are nocturnal, so investigating walls and fences at night with a torch will reveal other interesting species. You may be lucky and find a Garden Spider *Araneus diadematus* (see BAS Factsheet 4) rebuilding its web under the cover of darkness, or perhaps a tubeweb spider *Segestria* species (see Factsheet 9) at its retreat waiting for passing prey. Your car's wing-mirror almost certainly has a resident Missing-sector Orbweaver *Zygiella x-notata* – look out

for its characteristic web (see Factsheet 6).

Further afield

A walk in the countryside will yield many other species to study – all with fascinating behaviours and many with different web designs. You might find a female wolf spider carrying her egg-sac or young on her abdomen, or perhaps witness the courtship dance of a tiny jumping spider.

Enticing spiders out

You don't have to be a passive observer either; the vibrations of an electric (sonic) toothbrush or tuning fork (middle-C) can be used to charm spiders from their hidden retreats. Try this out on the funnel webs of large house spiders (*Tegenaria* species – see Factsheet 2) in your shed, or on the

fluffy, lace-like webs of laceweb spiders (*Amaurobius* species) on a larch-lap fence or in dense conifer hedging.

Temporary captives

For more detailed observations spiders can be kept in captivity. A clear, ventilated, plastic jar with a shallow layer of soil (dampened in one corner) and a few twigs for structure, positioned out of direct sunlight, will act as a temporary enclosure. You'll be able to watch web construction, prey capture, moulting and even breeding behaviour. Female large house spiders are excellent subjects and will readily produce a funnel web in captivity. They can be fed on blue-bottles, blowflies and other small insects. When you've finished with your observations, return the spider to its original habitat.

Other Arachnids

Harvestmen (see Factsheet 11) can be found in similar situations to spiders. False scorpions (see Factsheet 8) are tiny and usually revealed by serious searching rather than by casual observation.



Geoff Oxley

The large house spider *Tegenaria saeva* is a common resident inside buildings and in gardens. It can be charmed out of its retreat with a tuning fork or electric toothbrush!

HOW TO CATCH ARACHNIDS

Searching for arachnids can be challenging but fun. Depending on your interest and the habitat you're working in, there are several ways to catch them. Remember that different habitats will yield different species. You can buy much of the sampling kit from entomological suppliers, but with a little ingenuity you can make the equipment yourself much more cheaply.

Avoiding disease

Before embarking on fieldwork, make sure your Tetanus vaccination is up-to-date and guard against tick and insect bites. It is particularly important to familiarise yourself with the occurrence of Lyme disease in your area and its symptoms (see lyme-diseaseuk.com and www.nhs.uk/Conditions/Lyme-disease/Pages/Introduction.aspx).

Getting permission

Before collecting spiders, you should ask the landowner's permission. Many owners, and particularly Nature Reserve managers (see below), appreciate receiving a list of the species you find. On Sites of Special Scientific Interest (SSSIs), the owner

needs to have consent from the relevant Government agency (Natural England, Natural Resources Wales or Scottish Natural Heritage) if you plan to remove spiders from the site for identification.

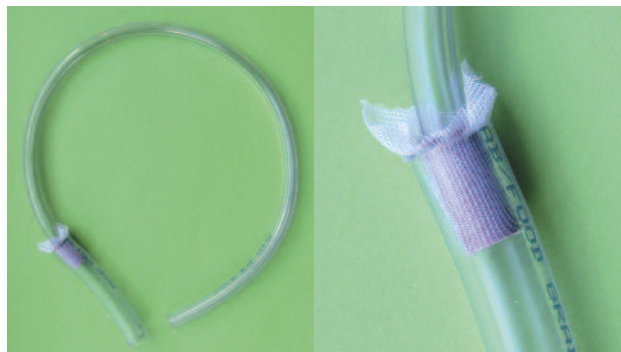
Catching methods

The most basic sampling kit comprises a variety of small, lidded plastic pots although more specialised equipment can be used, as described below. For specimens you need to take home, it is important to label the pot with a slip of paper inside, with location, habitat and date written in pencil.

- **Visual searching** can be very rewarding and has the advantage that spiders seen can often be associated with their distinctive webs. Simply examining buildings (inside and out), fences and shrubs can reveal a wide variety of species. The web architecture can indicate the family to which a spider belongs and is

therefore a major leap towards identification. Although many families do not spin webs to catch prey, this in itself helps to narrow down what the spider might be. Harvestmen are often seen wandering on vegetation or sitting on walls or fences.

- **Hand searching** is another simple way to find spiders. Grub around at the base of thick vegetation (you may wish to wear gloves) or look under stones, logs, or loose bark – carefully replacing them exactly as you found them. Larger spiders can be guided into a plastic pot with your fingers while smaller spiders can be caught without damaging them using a 'pooter'. In its simplest form this is made of two sections of plastic tubing pushed together, with a piece of gauze between them. You suck through the narrow-bore tube, aiming the other end at the spider, which is drawn into the



pooter (the gauze stops the spider reaching your mouth). The spider can then be blown gently into a collecting pot. Do not attempt to pooter spiders larger than the bore of the large tube – long-legged spiders and harvestmen, in particular, can be fatally injured in this way. Live spiders should be potted singly, because they are highly cannibalistic!



Richard Gellion

By hand searching for spiders you can learn about their ecology, web structure and behaviour.

- **Sieving** leaf-litter, moss and loose vegetation in a plastic garden sieve (1 cm mesh), over a plastic tray or sheet, is a useful way of locating spiders, harvestmen (see Factsheet 11) and false scorpions (see Factsheet 8). After sieving, return the leaf-litter or vegetation to where it was found.



Richard Gellion

Sieving leaf-litter vigorously over a tray helps you find small spiders, harvestmen and false scorpions.



P. Smithers

Sweep netting in long grass or vegetation will yield a variety of fascinating spiders.

- A **sweep net** can be made from a strong material bag (like heavy calico) held on a sturdy frame. This robust net is swept in front of you, in a figure-of-eight motion, as you walk slowly through long vegetation. Check the bag regularly, collecting any spiders or harvestmen of interest, before emptying out the contents and sweeping again. A simple sweep net can be made from the frame of an old tennis racquet (strings removed) to which a pillowcase is fixed with drawing pins.

- **Beating** shrubby/leafy vegetation with a stick over



P. Smithers

Using a beating tray to dislodge spiders.

a tray or upturned umbrella will dislodge interesting species, including from otherwise difficult-to-sample habitats like gorse. Be careful not to damage twigs or branches.

- **Pitfall traps** can be made from a pair of plastic drinking cups, one inside the other, sunk into the ground - their rims flush with the soil surface. Put a coarse wire mesh on the trap to stop small vertebrates falling in by accident and a rain cover e.g. a coffee-cup lid or a square of plastic, supported above the ground over the trap to prevent flooding. A small quantity of dried moss will provide crevices for the catch to hide in. Surface-active spiders (and other animals) fall into the traps and can't climb out again. Traps should be checked and the inner cup removed and emptied twice a day. If the traps are left without inspection for more than a day they need to contain a liquid (e.g. the antifreeze



Geoff Oxford

A pitfall trap in position, but without the wire mesh or a rain cover.

propylene glycol diluted 50:50 with water) to kill and temporarily preserve the spiders. Pitfall traps must be used with care because they are indiscriminate, sometimes catching large numbers of invertebrates. Make sure you have the time to process and identify your catch before embarking on pitfall sampling.

For additional collecting methods and further advice, see the *BAS Arachnologists' Handbook* (Russell-Smith *et al.* 2015).

IDENTIFICATION

As your interest develops you'll want to identify different species. Although only a handful of Britain's spiders are distinctive enough to be easily identified with the naked

eye, many can be identified when mature in the field with a 10x hand lens. Macrophotography is an increasingly popular way of recording and sharing images of arachnids and allows the identification of some species. Other species though, especially the tiny money spiders (Linyphiidae), can only be identified with a microscope as preserved adults. The best place to start is with *Britain's Spiders* (Bee *et al.* 2017), which gives guidance on the level of magnification needed to identify different species. For both harvestmen and false scorpions Field Studies Council charts covering all the species are available (Richardson 2010 and Legg & Farr-Cox 2016, respectively). For those wanting a more detailed

text for harvestmen, a free translation is available (see below) of the Dutch key by Windhoven (2009).

Immobilising spiders temporarily

Identifying live spiders often requires them to be temporarily immobilised in an appropriate position so that distinctive structures can be seen. A device such as a 'spi-pot' can be useful for this. Alternatively, placing a spider in a small, clear plastic bag which is gently folded over so that the animal is trapped carefully between the layers means that both surfaces are readily visible.

Immobilising spiders permanently

For most species, however, to be absolutely certain of their identity they will need to be killed and examined with a microscope. It is necessary to compare reproductive structures - the male palps and the female epigyne - with illustrations in guides such as the Collins Field Guide (Roberts 1995) or *The Spiders of Great Britain and Ireland* (1985). Preservation and microscope techniques are beyond the scope of this leaflet but are covered in full in Russell-Smith *et al.*'s *Arachnologists' Handbook* (2015).



A Spi-Pot from mini milk-containers

A live spider can be immobilised by putting it in pot A and gently inserting pot B to hold it between the cling film and the foam disc. Diagnostic features can then be viewed with a hand lens. Once identified, it can be released unharmed.

HELPING ADVANCE ARACHNOLOGY

Contributing to national recording

Advances in understanding distribution, abundance, phenology and habitat preferences of British spiders rely primarily on structured information collected by amateurs. One way in which you can contribute is by submitting your species records to the Spider and Harvestman Recording Schemes' national database, which already holds well over a million spider and around 46,000 harvestman records (contact details below). Accurate identification is, of course, vital and your records will need to be verified. For some species a good macro-photograph (usually requiring a dorsal view of the whole spider) is

sufficient. Records for a growing number of easily recognized species can be submitted online with a good photograph. These are listed at britishspiders.org.uk/srs_species_surveys together with guidance on submission. For other species guidance may be obtained from the resources recommended below, although for many species a preserved specimen will be required for checking. For false-scorpion records see the Pseudoscorpion Recording Scheme at www.chelifer.com/?page_id=81.

Contributing to arachnid biology

Details of the ecology and behaviour of many British spiders are undocumented. Amateurs can make a big contribution to advancing arachnology through

recording and publishing observations made both in the field and on arachnids kept in captivity. Guidance on keeping spiders in captivity can be found in the *Arachnologists' Handbook* (Russell-Smith *et al.* 2015). Inspiration for simple observations and experiments can be found in the classic book *World of Spiders* (Bristowe 1958), although spider names have changed considerably since its publication. Likewise, details of the lives of British harvestmen and false scorpions are still shrouded in mystery.

BAS members are encouraged to publish any findings in the Society's *Newsletter* and *Spider Recording Scheme Newsletter*; some amateur studies may also be suitable for our scientific journal *Arachnology*.

Possible investigation:

Everyone 'knows' that Large House spiders (*Tegenaria* species) head indoors during autumn either to find mates or to overwinter somewhere warmer.

Males of these species are certainly much more noticeable from August onwards but do they really come in from outside? By adding a tiny dot of paint (emulsion or acrylic) to the carapaces of individuals (see right) you find in your house, and a different coloured dot to those captured in the garden, you can test this idea. By noting 'recaptures' found in the house you can see whether any of them originated outdoors.



RESOURCES

BAS Factsheets

britishspiders.org.uk/factsheets

Books

Bee, L. & Lewington, R. 2002. *House and Garden Spiders*. FSC fold-out chart.

Bee, L., Oxford, G. & Smith, H. 2017. *Britain's Spiders: A Field Guide*. Princeton University Press, Woodstock.

Bristowe, W. S. 1958. *World of Spiders*. Collins New Naturalist (available second-hand or as print-on-demand from <http://www.newnaturalists.com>)

Legg, G. & Farr-Cox, F. 2016. *Illustrated Key to the British False Scorpions (Pseudoscorpions)*. FSC fold-out chart.

Richards, P. 2010. *Harvestmen of the British Isles*. FSC fold-out chart.

Roberts, M. J. 1985. *The Spiders of Great Britain and Ireland compact edition*. Harley Books, Colchester.

Roberts, M. J. 1995. *Spiders of Britain & Northern Europe*. HarperCollins Publishers, London.

Russell-Smith, T., Smith, H. & Oxford, G. 2015. *Arachnologists' Handbook*. British Arachnological Society, York.

Wijnhoven, H. *De Nederlandse hooiwagens (Opiliones)* Entomologische Tabellen 4, Naturalis Biodiversity Centre, Netherlands (available in the UK from Pemberley Books). A free, downloadable (but unillustrated) translation of the text is available from britishspiders.org.uk/srs_harvestmen_key

Online help with making collecting kit

Videos by Eco Sapient in collaboration with the BAS:

www.youtube.com/watch?v=ZDvIPf_ait4
(how to make a simple pooter)

www.youtube.com/watch?v=9HLxBuY66ew
(how to make a spi-pot)

www.youtube.com/watch?v=JfnpVZV56Gc
(how to make a sweep net)

www.youtube.com/watch?v=czbIDF1kPJE
(how to catch spiders with a sonic toothbrush)

www.youtube.com/watch?v=dLlByUe4EQ
(how to make a temporary spider enclosure)

Online identification guidance

(NB these European sites include some species not found in the UK)

www.araneae.unibe.ch

www.jorgenlissner.dk

www.pavouci-cz.eu

<http://wiki.spinnen-forum.de/index.php?title=Hauptseite>

www.eurospiders.com

Online help with identification of submitted photographs

Although many species of British spider cannot be definitively identified from photographs (see above) high quality images can be submitted to the following website for an expert opinion: britishspiders.org.uk/srs_contact_us (the British Arachnological Society's Spider Recording Scheme - images with full record details can be submitted via the 'Contact Us' page. If definitive identification is possible, this is the only route that ensures your records contribute to the national Spider and Harvestman Recording Scheme).

Help with identification is also available from: www.facebook.com/groups/BritishSpiderIdentification
<https://www.brc.ac.uk/irecord/>

Help with pseudoscorpion identification is available via the Pseudoscorpion Recording Scheme website - http://www.chelifer.com/?page_id=81

Kit suppliers include:

www.nhbs.com

www.watdon.co.uk

www.wildcareshop.com



The British Arachnological Society

The BAS is Britain's only charity devoted exclusively to spiders and their relatives. We use science and education to advance the wider understanding and appreciation of arachnids, and to promote their conservation. By joining the Society, you can keep up-to-date with the latest information on Britain's spiders, and on regional field meetings and identification workshops where you can expand your knowledge, expertise

and interest. All new members receive a free copy of our *Arachnologists' Handbook* (Russell-Smith *et al.* 2015) which provides a wealth of information on all the topics touched on in this leaflet, including much more on how to develop your identification skills using preserved specimens under a microscope. Members can also be allocated an experienced mentor, who can help them develop their interest in arachnology.



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