

## The evolution of field guides to British spiders

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## Abstract

We review the development of field guides (in a broad sense) to British spiders from 1678 to the present day, and note features which made, or make, them more or less suitable for use in the field. The review concludes by exploring the future of paper field guides to this group of organisms in the era of electronic devices.

**Keywords:** Araneae • egg-sac guides • family guides • spider identification apps • web guides

## Introduction

*A book for the identification of animals, birds, flowers, or other things in their natural environment* (OED 2021).

The term ‘field guide’ was apparently first coined in 1877 to describe a new flora of the London area (OED 2021). Despite the definition given above, the true origin of the field guide predated books; it took the form of dissemination of knowledge, in the field, from more experienced tutors or mentors to those who knew less. This tradition continues, of course, in the form of field studies programmes and identification workshops for various groups of organisms as well as for features of the physical environment, such as landforms. Here we review the evolution of British literature that enabled the (mostly) field identification of spiders in this country. For some material we allow a slight relaxation of the field guide definition to encompass texts that attempted to cover, comprehensively, the British spider fauna with species accounts and illustrations to aid the visual identification of specimens, but that were not very portable. Finally, we discuss the impact of the digital revolution on field identification, and the future of traditional, printed field guides.

## Historical development of field identification guides

### *Tractatus ... de Araneis* (1678)

Martin Lister published his *Historiæ Animalium Angliæ* in 1678. Of this three-part work, *Tractatus I* was devoted to spiders and, arguably, constitutes the first major contribution to understanding the biology and classification of this group in the world; an English translation was provided by Parker & Harley (1992). As well as many original observations on spider structures and biology, for example the use of the male pedipalp to transfer sperm, he attempted to classify spiders into species and then genera, a hierarchical system that predated that of Linnaeus by 80 years (Parker & Harley 1992: xii). Lister’s descriptions of individual species and their habits and habitats are generally accurate, and he provided outline drawings of some 30 taxa, some with both sexes illustrated (Fig. 1). Together, these would have allowed the accurate identification of some species, e.g. *Agelena labyrinthica* (Clerck, 1757) (Agelenidae), and the tentative naming of other species or species groups. The book was published in small quarto format (Table 1) and so might have been manageable in the field. In terms of identification, Lister’s claim that “it is not easy to find in this island any new species that I have failed to describe” (Parker & Harley 1992: 49), after describing 34 species of spider (and three harvestmen and a mite), meant it was far from comprehensive.

### *A History of the Spiders of Great Britain and Ireland* (1861–64)

John Blackwall, the leading arachnologist of his time, published this monumental work in two volumes. He described and illustrated 304 species, some of which are now known to be synonyms. His species descriptions are comprehensive, and include information on overall sizes of females (less often males), the number and disposition of eyes (eye arrangements of spiders can give a clear indication of family), and extremely detailed accounts of the colour and morphology of almost every body part. The beautiful and accurate hand-painted, whole-body illustrations comprise 29 plates, often with additional line drawings of salient features including eye patterns, sternum shapes, and other characters useful for identification (Fig. 2). For many species, ventral views of male palps are shown, but only very occasionally female epigynes; it has to be remembered that Blackwall was largely restricted to using a hand lens for identification (Bristowe 1951: 5; Savory 1961: 65). Favoured habitats and behaviours, e.g. the whirling of a disturbed *Pholcus phalangoides* (Fuesslin, 1775) (Pholcidae) in its web, are included in the species accounts. Although extremely useful for identifying specimens brought in from the wild, the two volumes were large and heavy (Table 1); definitely not a field guide in the strict sense.

## CHAPTER II

*Of the snarer spiders, according to species, and especially of those which continually watch for prey in the centre of a web close to which neither retreat nor nest is likely to be seen*

## TITULUS I

[*Metellina segmentata* (Clerck, 1757)]

[Plates 1 & 2, figs 1]

A yellowish spider, with plump white abdomen, especially at the highest part and around the sides; eyes black and extremely bright on a white head.

## Description

This is to be counted among the medium-sized spiders.

The legs, especially the front pair, are fairly long, not particularly slender, lightly spotted, otherwise yellowish; and they also have stiff hairs like spines that are seen easily with the naked eye. In length they are ranked as follows: the first pair is longest of all, next longest is the second pair, the third pair is shortest of all, but the last pair is little shorter than the second.

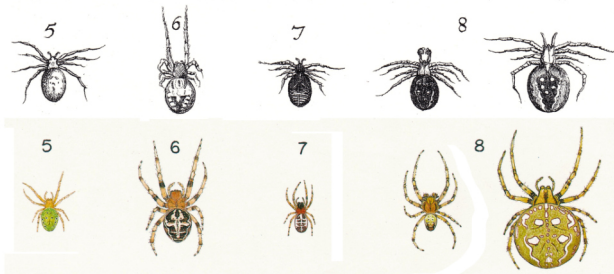


Fig. 1: Page from the Parker & Harley (1992) translation of Lister (1678). Inset at bottom: upper—five species illustrated by Lister; bottom—the same species painted by Mike Roberts. The species are: 5 *Araniella cucurbitina* ♀; 6 *Larinioides cornutus* ♀; 7 *Singahamata* ♀; 8 *Araneus quadratus* ♂ & ♀. Reproduced with permission from Parker & Harley (1992) *Martin Lister's English Spiders 1678*. Colchester: Harley Books.

*British Spiders: an Introduction to the Study of the Araneidae of Great Britain and Ireland (1866)*

Eliza F. Staveley's book followed hard on the heels of Blackwall but it seems to have been dismissed by at least some seasoned arachnologists over the years merely as a plagiarized and abbreviated version (Bristowe 1951: 14). Staveley is not mentioned at all by Savory (1961). However, it was aimed at an entirely different audience to Blackwall: amateur naturalists (Farr-Cox 2019). Eliza Staveley was the first British published female arachnologist (Sherwood 2022) and her book was a remarkable achievement, particularly given the misogynistic culture inherent in Victorian Britain. It continued to be the mainstay for naturalists and collectors for at least 60 years after publication, when copies of Blackwall and Pickard-Cambridge (1879–81) were scarce (Savory 1926: 63), and Farr-Cox (2019) suggests it was not equalled until Jones (1983), almost 120 years after its publication.

The book “being of a popular rather than of a scientific character” (Staveley 1866: 28) attempted to simplify identification by using generic characters that, although possibly not of universal taxonomic validity, did serve to differenti-

ate British species. For example, under the genus *Lycosa*, species are grouped according to whether the breastplate (sternum) is oval or heart-shaped, and for *Theridion*, the relative sizes of the eyes. These are characters potentially observable in the field with the use of a hand lens. In another innovation, Staveley tabulated the “arrangement of nests, cocoons and eggs” (Staveley 1866: 269–275), including information on, for example, whether the cocoon is carried by the female or not and, if so, how it is carried (attached to the spinnerets, under the breastplate etc.), its colour and size, and the colour of the eggs (Fig. 3). She also indicated species in which the female is usually found with the cocoon. The first two plates illustrate the eye patterns of some genera and species (Fig. 3). The other 14 plates depict a selection of species as hand-coloured line drawings, some of which resemble Blackwall's but they are not simply copies (Farr-Cox 2019). Beside each coloured illustration is a dorsal outline drawing depicting shape and approximate life size.

Staveley's book can arguably be regarded as the first, true field guide to British spiders. It is small and light (Table 1) and thus perfectly portable. Identification does not rely on microscopic examination of genitalia (none of which is illustrated) but instead on gross appearance, behaviour, habitats, and egg sacs (cocoons), all of which are observable in the field. It even has a short chapter on collecting and pre-

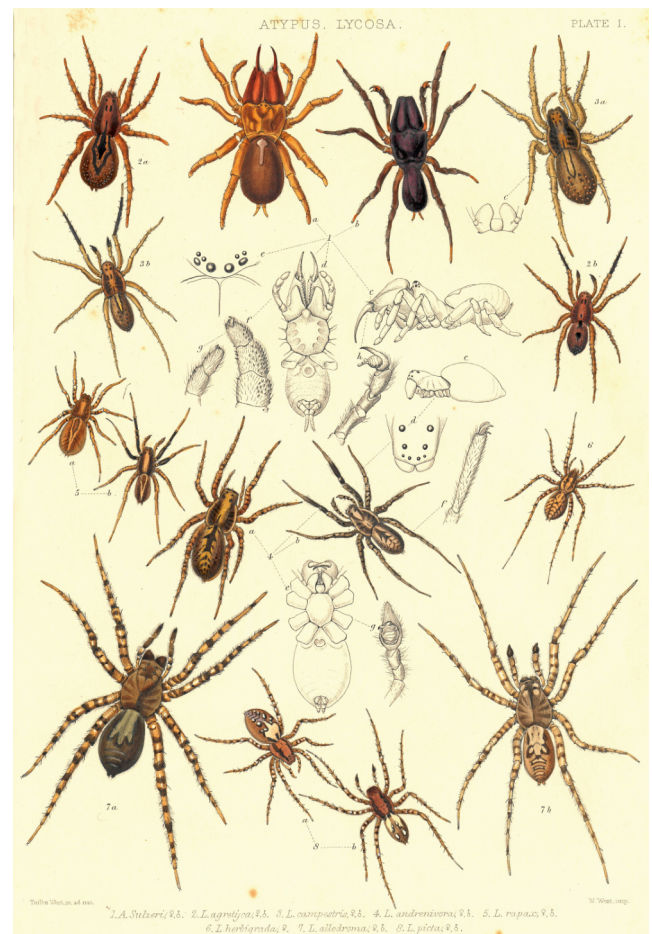
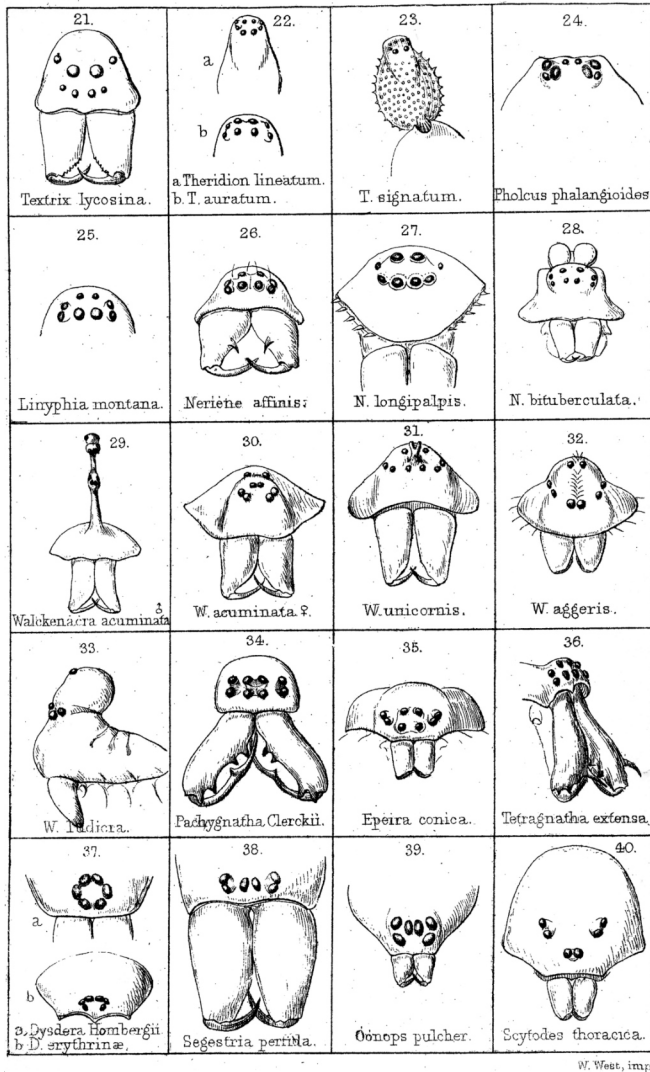


Fig. 2: Plate from Blackwall (1861–1864) illustrating the fine, hand-coloured drawings and details of palps and eyes of some species.

Plate II.



272

BRITISH SPIDERS.

Cocoon single, roundish, pale brown.  
*Epeira bicornis* .....  $\frac{1}{8}$  in.  
 Cocoons several, round, cream.  
*Nerieë rufipes* .....  $\frac{1}{8}$  in., eggs yellowish-white.

III. EGGS ENCLOSED IN ONE OR MORE COCOONS PLACED IN A CELL, NEST, ROLLED LEAF, OR SAC.

A. CELL FORMED WITHIN OR UNDER A LEAF OR LEAVES ROLLED AND FASTENED WITH THREADS.

\* Cocoon below a leaf curved backwards.  
 Cocoon single, round, white.  
*Theridion pulchellum*\* .....  $\frac{1}{8}$  in., eggs yellowish-white.  
 Cocoon single, round, greenish or bluish-green.  
*Theridion lineatum* .....  $\frac{1}{4}$  in., eggs yellowish-white.  
*Theridion nervosum* (sometimes. See F.)  
 Cocoon single, lenticular, white.  
*Thomisus bifasciatus* .....  $\frac{2}{5}$  in., eggs yellowish-white.  
*Clubiona holosericea* ♀ ...  $\frac{1}{4}$  in., ,, yellowish-white.  
*Clubiona amarantina* .....  $\frac{1}{8}$  in., ,, yellowish-white.  
*Clubiona accentuata* ♀ ...  $\frac{1}{2}$  in., ,, yellowish-white.

\*\* Cocoon between two leaves, bound together.  
 Cocoon single, lenticular, white.  
*Thomisus luctuosus* ♀ .....  $\frac{1}{4}$  in., eggs yellowish-white.  
 \*\*\* Cocoon in a cell amidst several leaves bound together.  
 Cocoons 2, lenticular, white.  
*Philodromus cespiticolis* ♀ ...  $\frac{1}{4}$  in., eggs pale yellow.

Cocoon single, round, green.  
*Sparassus smaragdulus*.  
 \*\*\*\* Cocoon in a folded dead leaf.  
 Cocoon single, lenticular, white.  
*Philodromus dispar* .....  $\frac{1}{4}$  in., eggs yellowish-white.  
 \* Merely suspended under and sheltered by a leaf.

Fig. 3: Two innovations from Staveley (1866). Left: a side-by-side comparison of head shapes and eyes; right: part of her guide to egg sac (cocoon) colouration and disposition.

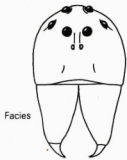
Author(s)	Publication date	Title	No. of species covered		Weight (g)	Size (cm)	Illustration type	Key/guides provided	ID aids needed
			Macro-spiders	Linyphi-idae					
Lister	1678	<i>Tractatus ... de Araneis</i>	33	1	?	21 × 16.5	☞	No	
Blackwall	1861–1864	<i>A History of the Spiders of Great Britain and Ireland</i>	191 <sup>1</sup>	113 <sup>1</sup>	2400	36 × 27	☞ ☞	No	🔍
Staveley	1866	<i>British Spiders: an Introduction to the Study of the Araneidae of Great Britain and Ireland</i>	188 <sup>1</sup>	113 <sup>1</sup>	500	19 × 13	☞ ☞	Family (eye pattern) & egg-sac	🔍
Lockett & Millidge	1951, 1953, 1974	<i>British Spiders</i>	352	274	1670	21.5 × 14	☞	Family & genera	🔍
Jones	1983	<i>The Country Life Guide to Spiders of Britain and Northern Europe</i>	~280 <sup>2</sup>	~45 <sup>2</sup>	580	19.5 × 12	📷	Family	🔍
Roberts	1985–1987	<i>The Spiders of Great Britain and Ireland</i>	348	267	4000	30 × 22	☞ ☞	Family & genera	🔍
Jones-Walters	1989	<i>Keys to the Families of British Spiders</i>	n/a	n/a	220	24.5 × 17.5	☞	Family	🔍
Roberts	1995	<i>Spiders of Britain &amp; Northern Europe</i>	~410 <sup>2</sup>	~40 <sup>2</sup>	600	20 × 13	☞ ☞	Family & genera	🔍
Bee & Lewington	2002	<i>A Guide to House and Garden Spiders</i>	37	3	40	24.5 × 17.5	☞ ☞	No	🔍
Bee, Oxford & Smith	2017, 2020	<i>Britain's Spiders. A Field Guide</i> <sup>3</sup>	393	11	1120	21.5 × 15.5	📷	Family, genera, web & egg-sac	🔍

Table 1: Summary of key features of British spider identification guides. Illustration types: ☞ = line drawings; ☞ = colour plates; 📷 = photographs. Identification aids needed: 🔍 = hand lens; 🔍 = microscope. Notes: <sup>1</sup> some now known to be synonyms; <sup>2</sup> includes some species found in northern Europe but not the UK; <sup>3</sup> figures refer to second edition, published in 2020.

### Family Oxyopidae

This family, with many tropical members, consists of three rather similar species in the genus *Oxyopes*, represented in the region.

The oxyopids have affinities with the salticids and lycosids; they are found in low vegetation, such as heather, where they hunt during the day. They are capable of running and leaping through the undergrowth with great ease on their quite long, slender legs with the long, erect spines but they can catch nearby prey simply by leaping from a stationary site like a salticid. In July the females can be found tenaciously guarding their flattened egg sacs which are placed in a crook of twigs, exposed at the top of the plant. Large immatures can be found in the early autumn in England, suggesting a life-cycle in which they overwinter twice before becoming adult.



#### *Oxyopes heterophthalmus* (Latreille)

Size female 5–7 mm; male 5–7 mm

Superficially, male and female resemble *Philodromus histrio*.

**Carapace** Brownish. Two divergent median bands occur posteriorly stopping at head. Thin white band partly encircles head, which has thin median stripe that continues down clypeus. White borderline continues around head to form large patches below lateral eyes. **Abdomen** Prominent cardiac mark (black in male) is edged in white which continues as line to spinners. Brown median band surrounds line. Sides are dark with forward-pointing streaks of white hairs. **Legs** Blackish, but thickly covered with brown and white hairs.

**Habitat** Heather. **Season** Early summer. **Distribution** In England in the New Forest and three heaths in Surrey where they are infrequent. France, Belgium.

#### *Oxyopes lineatus* Latreille

Size female c. 6 mm; male 4–5 mm

**Carapace** Much paler than *O. heterophthalmus*. White median bands continue thickly to lateral eyes. Borders are yellowish and almost devoid of hair. In male bands are surrounded by black, and black area in ocular region is clearly visible. **Abdomen** Less strongly marked than *O. heterophthalmus*, with oblique side bands faint in some specimens. Median band broader. **Legs** Very pale, with few hairs and no blotches.

**Habitat** Trees, bushes, and low vegetation. **Season** Summer. **Distribution** Absent from Britain. France, Holland, Belgium(?)

162

#### *Oxyopes ramosus* (Panzer)

Size female 6–10 mm; male 6 mm

**Carapace** Reddish brown; two white median bands almost parallel but broken into dots immediately behind head. With white hairs on margin continuing as thin stripes on clypeus. **Abdomen** Reddish brown, with broad median band paler. Three oblique side stripes. **Legs** Dark brown. Femora and patellae very dark, tibiae and metatarsi with annulations, tarsi with dark apical ring.

**Habitat** Similar to *O. heterophthalmus*. **Season** Early summer. **Distribution** Absent from Britain. Most of region, including Sweden, Finland.



♀  
*Oxyopes heterophthalmus* on egg sac



*Oxyopes lineatus* and egg sac

Fig. 4: Double-page spread from Jones (1983): the first photographic guide to British spiders.

serving spiders for newcomers to the subject. In these respects, it pioneered aspects of identification in nature that have echoes in all subsequent field guides.

#### *British Spiders* (vols. 1 & 2 1951–1953; vol. 3 1974)

In the preface of Ted Locket and Frank Millidge's book, they stated that, by the middle of the twentieth century, the number of spider species known from Britain had practically doubled since the publication of Blackwall's *A History of the Spiders of Great Britain and Ireland* (1861–64). Much of this increase in knowledge and the consequent identification of new species was achieved by reference to works on European spiders; there was a serious need for a work on British spiders that included all the new species identified since Blackwall. Volumes 1 and 2 of *British Spiders* became the go-to reference for microscopic identification of spiders in Britain and included thorough species accounts describing the appearance of the different body parts (carapace, eyes, abdomen, sternum, and legs), useful habitat information and detailed drawings of the female epigyne and male pedipalps. In 1974, a third volume, co-authored by Peter Merrett, focussed primarily on distribution maps for all British species. This addition to the title

enhanced its use by giving indications of where in Britain particular species were likely to be found. The fact that identification mostly involved microscopic examination, and that only very few whole-body illustrations of species, as black and white drawings, were provided, meant any use in the field was extremely limited.

#### *The Country Life Guide to Spiders of Britain and Northern Europe* (1983)

Dick Jones's book was the first to provide photographic identification of the majority of British macro-spiders. Species were included "which can be recognized and identified by shape and markings" (Jones 1983: 39). Only 47 species of micro-spiders (Linyphiidae) were considered, based on these criteria. The book also covers 25 species of harvestmen (Opiliones). The majority of species are illustrated with Jones's own photographs taken against natural backgrounds, which are still seen as excellent, even in the era of digital macrophotography. All species have short accounts describing size, key characteristics, habitats and distributions (Fig. 4). The introduction covers basic spider biology and leads on to sections on finding spiders and the equipment and methods used. A four-page, line-illustrated

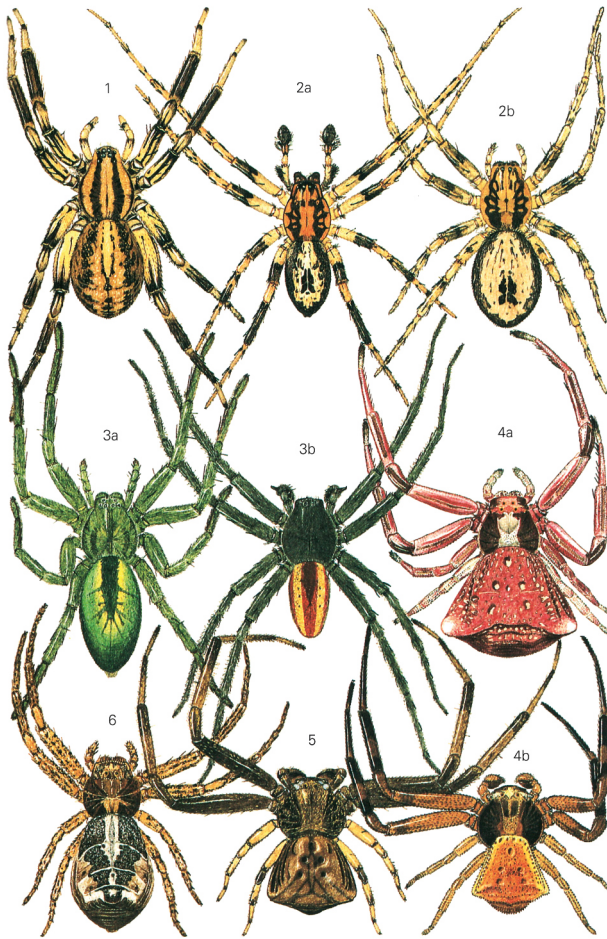


Fig. 5: Plate from Roberts (1995) showing the intricate, interdigitating paintings. Reproduced with permission from Roberts (1995) *Collins Field Guide to Spiders of Britain and Northern Europe*. London: HarperCollins.

key to spider families describes the main characteristics of each including overall shape, and where relevant, face shapes, eye patterns, web types, and spinneret arrangements.

This small, easily carried book (Table 1) was an important game changer in British arachnology and, as mentioned above, was, in its scope and intentions, really the successor to Staveley's book from twelve decades earlier. Its popularity is attested by the publication of a second, revised edition published by Hamlyn in 1989 (Jones 1989).

#### *The Spiders of Great Britain and Ireland (1985–1987)*

Published by Harley Books in three volumes, this prodigious work by Mike Roberts was hailed as the modern Blackwell and gave arachnologists the wherewithal to identify all the spider species known in Britain at the time. Volumes 1 and 2 contain very brief species accounts and highly detailed illustrations of female epigynes and male palpal organs enabling, through microscopic examination, identification to species level. Volume 3 contains full colour plates of 307 species representing all the spider families known in Britain. The images are enlarged to aid identification, and

sometimes show both sexes of the same species. However, it is in no way a field guide; the three volumes are large and, collectively, heavy (Table 1). This, together with the need for a microscope, makes any use in the field impracticable.

#### *Keys to the Families of British Spiders (1989)*

This title, written by Lawrence Jones-Walters and published by the Field Studies Council in their AIDGAP series, contains two spider family identification keys. The first is a traditional dichotomous key and is best used when observing a spider under microscopic magnification. The second key is a tabular illustrated guide and, as the information on the rear cover of the book stated “includes a range of behavioural and ecological characters, and should enable beginners to put a name to spiders in the field”. It should say ‘put a name to spider families’ but, nevertheless, the fact that this tabular key has column headings which include features observable and helpful for identification in the field, places this work directly in the field guide genre.

#### *Spiders of Britain and Northern Europe (1995)*

Ten years after the publication of Mike Roberts's comprehensive three-volume work on the British spider fauna *The Spiders of Great Britain and Ireland (1985–1987)*, HarperCollins published a scaled-down version in their Collins Field Guide series. In his Preface, Mike maintained that “This guide, for the first time, allows colour illustrations, and illustrations of epigynes and male palpal organs, to be taken out and used in the field. When used in conjunction with a small field microscope and a ‘spi-pot’, spiders become as accessible in the field as any other group of plants or animals” (Roberts 1995: 7). This could conceivably be true if the budding field naturalist was willing and able to purchase a field microscope. Illustrations of how to make a spi-pot (a simply made restraining device for examining live spiders), and of a field microscope and spi-pot in use, are included in a section on Identifying Spiders in the Field. However, using this equipment in the field to try to match genitalia of live spiders with those illustrated in the book is fraught with difficulty. The pedipalps and epigynes in the book are drawn from alcohol-preserved material, which can give them a subtly different appearance to those in live specimens. If the book were to be truly regarded as a field guide, then the genitalia should have been illustrated from spi-pot viewed, live material. Even then, orientating male palps to exactly the correct viewing angle is extremely difficult. The book includes sections on egg-sacs and webs, each illustrated by black and white drawings. However, webs or egg-sacs are not grouped together according to similar features and as such there is no attempt to provide a logical guide to these examples of spider activity that could be of use in the field.

The 32 colour plates each contain illustrations of up to nine different spider species (Fig. 5); redrawn and reduced versions of those included in Vol. 3 of *The Spiders of Great*

**ID** SPIDERS WITH A LONGER OVAL ABDOMEN and/or WITH CONSPICUOUS SPINNERETS

LEGS: all short-medium; ABD: oval, pointed tip; spinnerets conspicuous; PATTERN: plain-subdued	LEGS: I long, II-IV medium; ABD: oval, pointed tip; spinnerets conspicuous; PATTERN: strong	LEGS: I, II, III medium, IV long; ABD: oval, rounded tip; PATTERN: subdued-obvious
EYES: ▶ p. 68 LINE 6 Nocturnal hunters, will often jump	EYES: ▶ p. 68 LINE 8 Abdomen yellowish green with stripe	EYES: ▶ p. 67 LINE 11 In leaf-litter and low vegetation
CLUBIONIDAE Sac spiders ▶ p. 96 p. 319 2 genera   24 species	CHEIRACANTHIDAE Yellow sac spiders ▶ p. 97 p. 332 1 genus   3 species	MITURGIDAE Ghost spiders ▶ p. 80 p. 360 1 genus   4 species

Clubionidae and Gnaphosidae are very similar and most reliably told apart by differences in their spinnerets and eye patterns – see family guides for details.

LEGS: I-IV short-medium, (leg IV typically longest); ABD: oval, spinnerets conspicuous; PATTERN: plain (6 spp. obvious)	LEGS: all long, III-IV covered in short hairs; ABD: oval, rounded tip; PATTERN: plain	LEGS: all long-very long; ABD: oval, pointed tip; spinnerets conspicuous; PATTERN: subdued-strong
EYES: ▶ p. 68 LINE 7 Nocturnal hunters on open ground	EYES: ▶ p. 69 LINE 11 Britain's only truly aquatic spider	EYES: ▶ p. 69 LINE 5 Spinnerets separate from wolf spiders
GNAPHOSIDAE Ground spiders ▶ p. 98 p. 337 11 genera   34 species	DICTYNIDAE <i>Argyroneta</i> Meshweb spiders ▶ p. 88 p. 292 1 genus   1 species	AGELENIDAE Funnelweb spiders ▶ p. 105 p. 274 3 genera   11 species

60 \* see also p. 63 top left

THOMISIDAE: *Thomisus*

**Thomisus** 1 British species (illustrated)  
The British *Thomisus* species is one of our most striking spiders. Its appearance, body shape and colouring allow for fairly easy recognition.

**LC Thomisus onustus** Heather Crab Spider

♂ 2.5–3.5 mm  
♀ 6–7 mm

♂ ♀ J F M A M J J A S O N D

**OBSERVATION TIPS/HABITAT:** Occurs on heathland, typically on the flowers of Bell Heather and Cross-leaved Heath where it awaits prey. Occasionally found on other plants, where its ability to change colour according to its surroundings gives it excellent camouflage. The ♂ and ♀ are quite different. **DESCRIPTION: CARAPACE** ♀ broad, whitish-yellow central band flanked by brown lateral bands. ♂ dark brown with narrow, paler median band. In both sexes lateral eyes are on conspicuous tubercles at the anterior corners of the head area. **ABDOMEN** ♀ very variable in colour – can be pink, yellow, white or a combination of the three. When viewed from above, the abdomen has a distinctly triangular shape which is truncated anteriorly. There is a distinct conical tubercle on each of the two posterior points of the triangle, with a flattened triangular area to the rear between these points. ♂'s are similar in shape to ♀'s but much smaller and usually a darker, brownish-orange. **LEGS** ♀ colour variable, matching that of the abdomen, sometimes with paler markings on legs I and II. Tibia and metatarsus I with short spines. ♂ legs I and II relatively long. **SIMILAR SPECIES:** *Pistius truncatus* (p. 382). **DISTRIBUTION/STATUS:** Restricted to central-southern England where it is very local.

Nationally Scarce  
Scarce, regional

*Thomisus onustus* ×4

Yellow and pink variations (ABOVE) and a 'seaside rock' mix (LEFT)

380

Fig. 6: Two pages from Bee, Oxford & Smith (2020). Left: part of the tapered key to spider families; right: a typical species account. Reproduced with permission from: Bee, Oxford & Smith (2020) *Britain's Spiders. A Field Guide, second edition*. WILDGuides: Princeton: Princeton University Press.

*Britain and Ireland* (1985–87). The plates are positioned centrally within the book and therefore cross referencing between a species account and an illustration is not ideal, particularly in the field.

The Collins Field Guide provided a cheaper and more accessible source of genitalia illustrations than Roberts's previous three volume work and made the book an incredibly useful and easily handled reference for those learning to identify spiders using a microscope. The book has never practically been regarded as useful away from the desk; as many owners have testified: *it is in no way a field guide!*

*A Guide to House and Garden Spiders* (2002)

This chart was published by the Field Studies Council as part of their very successful series of Wildlife Fold-out Guides. Written by Lawrence Bee and beautifully illustrated on one side with colour paintings by Richard Lewington, the reverse has brief details of the featured spiders including similar information to that given in the tabular key of *Keys to the Families of British Spiders* (above). The emphasis is on features that can be observed in the field along with indications of habitat preferences. However, only 40 species are included (Table 1). It was intended as a guide to commonly

encountered species around the house and garden, and to encourage a deeper interest in spiders.

*Britain's Spiders. A Field Guide* (2017, second edn 2020)

Early in the 21st century, a new series of field guides to groups of British wildlife appeared. WILDGuides, as they were known, used high resolution digital images to illustrate organisms, highlighting features discernible in the field. In 2017, *Britain's Spiders*, written by Lawrence Bee, Geoff Oxford, and Helen Smith, was published in this series. It followed the style of the existing WILDGuides titles and covered all the non-lynphiid spiders found in Britain. As with Dick Jones's book, the majority of the linyphiids were excluded because most of them are tiny and generally dark in colour. Any attempt to recognise them to species or even genus level in the field by referring to photographic images, however good, would be impossible. The book was designed to be taken into the field and used in conjunction with a 10× hand lens and a spi-pot.

All species included in the book have their own accounts and are accompanied by dorsal images on natural backgrounds, with close-up details of characters providing valuable field features. The accounts feature descriptions of the

carapace, abdomen, and legs, with brief remarks on habitat and UK distribution, together with a distribution map, phenology and conservation status information. The first part of the book encompasses a comprehensive introduction to Britain's spiders, including their biology and relationship with people. Information on finding, collecting and examining live spiders for identification is followed by structured photographic guides to spider families and genera, webs, and egg sacs. The main bulk of the book comprises the species accounts (Fig. 6). Later sections include information on working in the field, recording spiders and conservation status evaluation, together with an annotated checklist of the entire British spider fauna.

One of the main issues in using a guide of this kind in the field is the tendency to misidentify by attempting simply to match the species with the image. In the species accounts and the introductory section, the similarity of many spiders in the same genus is repeatedly stressed and the requirement for microscopic examination to confirm many species is highlighted throughout the text. An important feature of these accounts is the presence of icons indicating the feasibility of identifying a spider in the field. Icons showing an eye or a hand lens suggest field identification is possible whereas a microscope indicates that microscopic examination is required to confirm identification.

The comprehensively revised second edition of *Britain's Spiders* (2020) includes accounts for nine species recorded in Britain since the publication of the first edition, and a new section on accidental imports. Its main innovation, developed in collaboration with Rob Still from the *WILDGuides* team, was a much more tapered guide to the identification of a captive specimen (Fig. 6). This progresses from simple picture matching for a number of very common and obvious species/groups, through a brief guide to families emphasising, in particular, body shapes, relative leg lengths and eye patterns. It continues with a more detailed guide to families using the number and relative shapes and sizes of eyes, in conjunction with abdomen shape and patterning and legs. Its final section covers families in more detail, with number of species, carapace as well as abdomen characteristics, features of the included genera and indications of similar families which could cause confusion. The aim was to allow readers of different experiences to dip into the guide at a level appropriate to them and eventually to be directed to the correct family/genus in the species accounts.

Each of the publications discussed here has different characteristics and intentions, which make (or made) them more or less practicable as true field guides. Some of these features are mentioned under the various titles above and are compared in Table 1.

### Beyond paper

What of the future of field guides? While the new *WILDGuides* book may come closest to the field guide definition for spiders in Britain to date, the future of printed guides is challenged by the increasing range and sophistication of identification aids made possible by smart phones, tablets and similar devices.

Like others in the *WILDGuides* series, *Britain's Spiders* has been available as an eBook ([press.princeton.edu/books/ebook/9780691211800/britains-spiders](http://press.princeton.edu/books/ebook/9780691211800/britains-spiders)) from first publication, making it much more portable for field use. Beyond the book format, many websites offer galleries of photographs of spiders that can assist with identification. Although the standard of photography is high, very few of these sites offer identification guidance or other information about the spiders. It is impossible for inexperienced users to evaluate the reliability of the identifications presented, and few sites attempt to offer anything like comprehensive coverage of the British spider fauna. The best of these galleries are from continental European authors. Some include photographs and/or drawings of the critical features of the genitalia, and have become important identification reference works (e.g. [arachno.piwigo.com](http://arachno.piwigo.com)), but these features place them outside our definition of a field guide.

A more important development has been of identification apps, which offer much greater functionality and flexibility of use, and are growing rapidly in range and popularity. Many are free and easily downloaded. They potentially allow rapid navigation between all the elements available in a traditional field guide and, for some taxa, can include additional identification pointers, such as sound recordings. Perhaps the most comprehensive current example of a spider identification app is *Spidentify*, which, to date, covers over 280 Australian species ([identify-spiders.com](http://identify-spiders.com)). This provides all the features of a field guide with added ease of navigation, including step-by-step guidance through the process of identifying an unknown spider, eventually providing a list of best matching species. Detailed information is given for each species along with pop-up glossary access, browsing by categories such as families and habitats, and supplementary content including spider biology and myth-busting. For British spiders, this approach is still in its infancy, with the Society of Biology's extremely basic *Spider in da House* app ([apps.apple.com/gb/app/spider-in-da-house/id680780793](https://apps.apple.com/gb/app/spider-in-da-house/id680780793)) helping users to identify 14 of the commonest synanthropic species.

Increasingly, apps including field identification guidance and access to expert opinion for verification, are linked to recording schemes. This not only provides help with field identification but also enables the capture of reliably identified species records. The user can be further rewarded with feedback of up to date information on records in their area. In the UK, for example, *iRecord* ([brc.ac.uk/irecord/](http://brc.ac.uk/irecord/)), run by the Biological Records Centre as part of the work of the UK Centre for Ecology & Hydrology, fulfils this identification and data capture role for many species groups. It has yet to be linked to the national Spider Recording Scheme ([srs.britishspiders.org.uk/](http://srs.britishspiders.org.uk/)) although it does capture many casual spider records.

Perhaps pushing even further the boundaries of what can be described as a field guide, the internet can deliver almost instant access to expert identification guidance in the field via social media groups such as Twitter (e.g. [@britishspiders](https://twitter.com/britishspiders)), and Facebook (e.g. the British Spider Identification Group [@BritishSpiderIdentification](https://www.facebook.com/BritishSpiderIdentification)). These instant access platforms, in some sense, hark back to the pre-book era of knowledge exchange mentioned in the Introduction. How-

ever, they clearly depend on the availability of experts to answer questions, and on users needing to evaluate which experts are reliable. Since they often have little basis for making this judgement, it can present significant quality control issues for records derived in this way.

Image recognition software, based on AI-powered technology that uses a smartphone camera and deep machine learning, is a more recent dimension to field identification methods. The Google Lens app ([en.wikipedia.org/wiki/Google\\_Lens](https://en.wikipedia.org/wiki/Google_Lens)), still in its infancy, provides a generic example. By comparing photographs of specimens with extensive online image libraries, it is already able to make accurate suggestions for many distinctive spider species. Users are referred to the Wikipedia page for the species suggested, giving some scope for further evaluating the identification. Google Lens and similar generic apps are currently limited by a dependence on the sometimes-erroneously identified spider images online, and still require considerable refinement to distinguish species with similar shapes and patterns. However, such limitations can be overcome by apps dedicated to specific taxonomic groups and based only on images that have been reliably identified.

The Merlin app ([merlin.allaboutbirds.org/](https://merlin.allaboutbirds.org/)) developed by the Cornell Lab of Ornithology already provides sophisticated image recognition for bird identification for much of the world. It uses verified, community contributed photographs backed-up by range maps based on the billions of observations contributed to the eBird recording scheme ([ebird.org](https://ebird.org)). Birds are a relatively easily identified group with huge distributional datasets, but similar apps are nevertheless likely to have a significant future role in spider identification. The use of AI learning raises the, perhaps disconcerting, possibility that these apps may eventually utilise features not detected by the human eye to distinguish between species.

Just as with traditional printed field guides, all developments based on field identification from photographs suffer the major limitation that many spider species cannot be reliably distinguished without microscopic examination of the genitalia. Again, though, technology may offer solutions. For some species at least, advances in macrophotography of live specimens have opened up the possibility of using these features for field identification guidance, both printed and digital; perhaps, ironically, returning us to a model akin to Mike Roberts's *Collins Field Guide*.

While all of these technological changes are a growing part of the armoury for identifying spiders in the field, printed field guides, like books more generally, currently enjoy a healthy market (Andy Swash, pers. comm.). Although there is some evidence of collecting series publications, such as *WILDGuides* ([press.princeton.edu/series/wildguides](https://press.princeton.edu/series/wildguides)) for the lifestyle pleasure of a bookshelf of matching spines, the buoyancy of book sales is clearly much greater than can be explained by this alone. Children's literature is currently the most flourishing part of the general book market (e.g. see [statista.com/statistics/305663/book-sales-revenue-from-children-s-books-in-the-uk](https://statista.com/statistics/305663/book-sales-revenue-from-children-s-books-in-the-uk)), suggesting an enduring love of books. While the future of field identification guidance is likely to look very different, for the time

being at least, traditional field guides seem likely to retain their place in an increasingly diverse market.

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