

# The Newsletter

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*Thanatus formicinus* female from Clumber Park. © Richard Gallon.

## ***Sibianor laeae* Logunov, 2001 a Salticidae New to Britain, with Notes on *Heliophanus dampfi* Schenkel, 1923 and Other Spiders from Holcroft Moss SSSI**

by Richard Burkmar\* & Richard Gallon<sup>o</sup>

On 14th June 2018, RB met Sarah Bennett of the Cheshire Wildlife Trust at one of their lesser known reserves, Holcroft Moss, which lies just to the south of the M62 motorway east of Warrington in the modern county of Cheshire (but just in the old vice county of South Lancashire - VC59). Sarah introduced RB to this small part of the once huge complex of lowland raised bogs that existed in low-lying areas to the west of Manchester and Salford (Fig. 1).

Much of that original expanse of bog has been lost over the last couple of centuries to agriculture and urban development, as well as commercial peat cutting. Many of the remnants have been secured by conservation NGOs including the Lancashire Wildlife Trust and the Cheshire Wildlife Trust who are working in partnership on the landscape-scale *Carbon Landscape* project to restore and connect them.

Unlike most of these remnant bogs, the part of Holcroft Moss that remains has never been extensively cut for peat. So, although at around 20 hectares, it is not one of the larger remaining bogs, it is one of the least modified fragments and therefore particularly interesting to the natural historian. On this morning Sarah (the reserve manager) and RB were locating areas to sample spiders using a modified garden leaf blower/vacuum (G-vac), sweeping and beating. RB undertook the survey as a volunteer – part of a series of surveys across bogs in Cheshire and Lancashire in association with the Tanyptera Trust project.

Sarah was keen to survey a heath area on the edge of the bog (Fig. 2) and some of the rewetted areas towards the south-eastern boundary (Figs. 3–4). The G-vac was effective at extracting good numbers of small spiders from the heath and bog vegetation, including a variety of small jumping spiders (Salticidae) which, as is usually the case



Figure 2. Rich Burkmar at the heath site (SJ687932) where *Sibianor laeae* was first discovered at Holcroft Moss. This area also supports *Heliophanus dampfi* and *Talavera aequipes*. © Richard Gallon.

with such small spiders, mostly remained unidentified in the field.

The highlights in the field included good numbers of *Neoscona adianta* (Holcroft was a known northern outpost for this species), a rather magnificent mature female *Gibbaranea gibbosa* (a VC59 first) and lots of Bog Bush Crickets (*Metrioptera brachyptera*)! But it was the tiny salticids that would eventually steal the show.

Back at the microscope RB identified the spiders collected. The salticids were interesting, to put it mildly. There were plenty of *Neon reticulatus*, as expected, but then a surprise; several spiders collected from the heathy area were *Talavera aequipes*, which was a new spider to RB and one that had never been recorded before in either Cheshire or South Lancashire. Then came an even bigger surprise from the same area; another new spider to RB which he identified as the Nationally Scarce *Sibianor aurocinctus*. *Sibianor* has a remarkable distribution – mainly concentrated around the Thames corridor, but with just a scattering of records across the country as far north



Figure 1. The extent of lowland peatlands between Greater Manchester and Liverpool, indicating the original extent of lowland raised bogs and the current extent of the habitat. Extent of peatlands derived from data supplied by the British Geological Survey.



Figure 3. Vacuum sampling arachnids at Holcroft Moss. Foreground within a recently constructed bund supporting *Eriophorum angustifolium*, background showing extensive *Molinia caerulea* growth across the bog surface. © Richard Gallon.

as Scotland. But both these discoveries were eclipsed – or so it seemed at the time – by a specimen from one of the re-wetted areas on the reserve; a female *Heliophanus dampfi* (Figs. 31–34). This Nationally Rare species had only been recorded from a single site in West Wales and a restricted area of Scotland around Stirling.

However, Cheshire Record (Local Environmental Record Centre for Cheshire) already had a record of *H. dampfi* from Holcroft made in 2000 by Alan Scott (see below). They were unable to verify this record because Alan died and the whereabouts of his specimens is unknown. The rediscovery of *H. dampfi* is sufficient evidence to verify Alan's original record and include them in the S.R.S. database.

The discovery of *H. dampfi* and the other salticids warranted a repeat visit and RB invited RG to return to the site with him on the 28th July 2018. We collected more jumping spiders including *Sibianor*, which we recognised in the field by their squat, rectangular shape, commenting at the time how colourful and ant-like they appeared.

Back at our respective bases we set to identifying our samples. There were more adult female *H. dampfi* and



Figure 4. Aerial image of Holcroft Moss SSSI (Bing aerial photography) showing the areas where *Sibianor larvae* and *Heliophanus dampfi* were recorded. The main heath area is in the eastern corner and the new bunds (dark region) to the west of this.



Figure 5. Falconer's adult male *Sibianor larae* from Kirkby Moss collected 8th September 1924. Note the contrasting reddish patellae on the front leg. Scale = 1 mm. © Richard Gallon.



Figure 6. Falconer's immature female *Sibianor larae* from Kirkby Moss collected 8th September 1924. Note the two transverse pale dorsal abdominal bands, which although worn in this specimen are covered with scale setae in life giving the species an ant-like appearance. Scale = 1 mm. © R. Gallon.

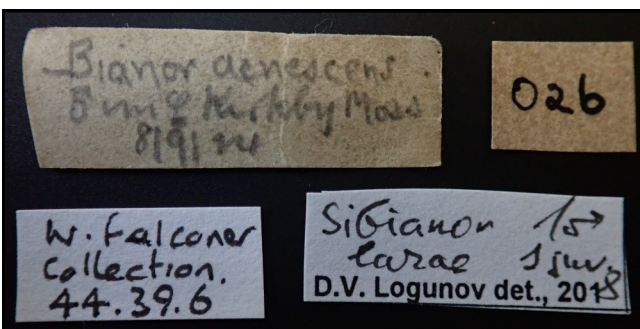


Figure 7. Specimen labels associated with Falconer's Kirkby Moss *Sibianor larae* specimens in the World Museum, Liverpool. © Richard Gallon.

another adult female *Sibianor*. As we looked at separate female *Sibianor*, each of us – unbeknown to the other – began to doubt RB's original determination of *S. aurocinctus*. Our e-mails suggesting an alternative determination of *Sibianor larae* actually crossed!

**Taxonomy and Distribution**

*Sibianor larae* Logunov, 2001 was only recently described as a distinct species (Logunov, 2001). Prior to Dmitri's paper *S. larae* was misidentified with *Sibianor*



Figure 8. Adult male *Sibianor larae* from Holcroft Moss collected 15th September 2018. Note robust front legs and reflective abdominal scale setae markings. © Richard Gallon.



Figure 9. Adult male *Sibianor larae* from Holcroft Moss collected 15th September 2018. Note reddish patella and proximal region of tibia on the front leg. © Richard Gallon.

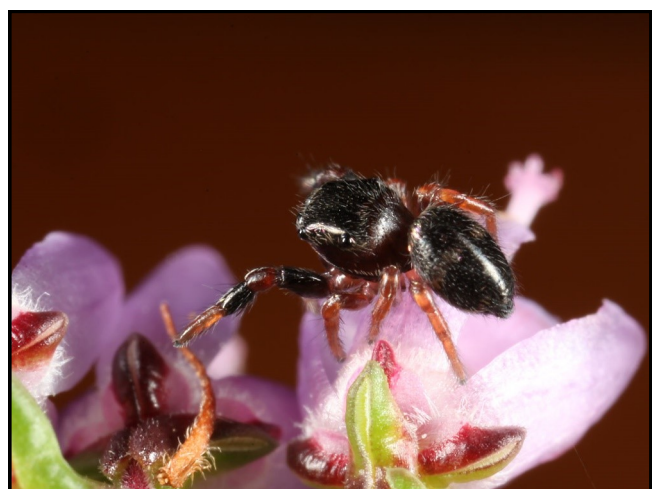


Figure 10. Immature *Sibianor larae* from Holcroft Moss collected 28th July 2018. The reddish patellae on the front leg are evident in juveniles. © R. Gallon.

*aurocinctus* (Ohlert, 1865). Although Dmitri's holotype of *S. larae* was from the island of Sakhalin in eastern Russia, he also identified specimens from Finland and Sweden revealing that this previously unrecognised species has a wide Euro-Siberian distribution. Dmitri distinguished *S.*



Figures 11–14. Adult male *Sibianor larae* from Holcroft Moss: 11. dorsal; 12. lateral; 13. anterior; 14. leg I retrolateral view. Scale = 1 mm. © Richard Gallon.

*larae* from *S. aurocinctus* by its contrasting red patellae on the front legs, and by proportional differences to the male's tegulum and female's insemination ducts. Almquist (2006) provided further details on Swedish specimens of *S. larae*.

Van Keer *et al.* (2010) reported that *S. larae* was discovered as new to Belgium in 2009 and also mentioned unpublished records from Germany. In 2008 *S. larae* was identified from The Netherlands (Vogels, 2012) and was recognised from the Czech Republic in 2014 (Roušar,



Figures 15–18. Adult male *Sibianor aurocinctus* from Rainham Marshes, Essex: 15. dorsal; 16. lateral; 17. anterior; 18. leg I retrolateral view. Scale = 1 mm. © Richard Gallon.

2015; Hula, 2015). Tilly (2015) published on the discovery of *S. larae* in north-western France 2012.

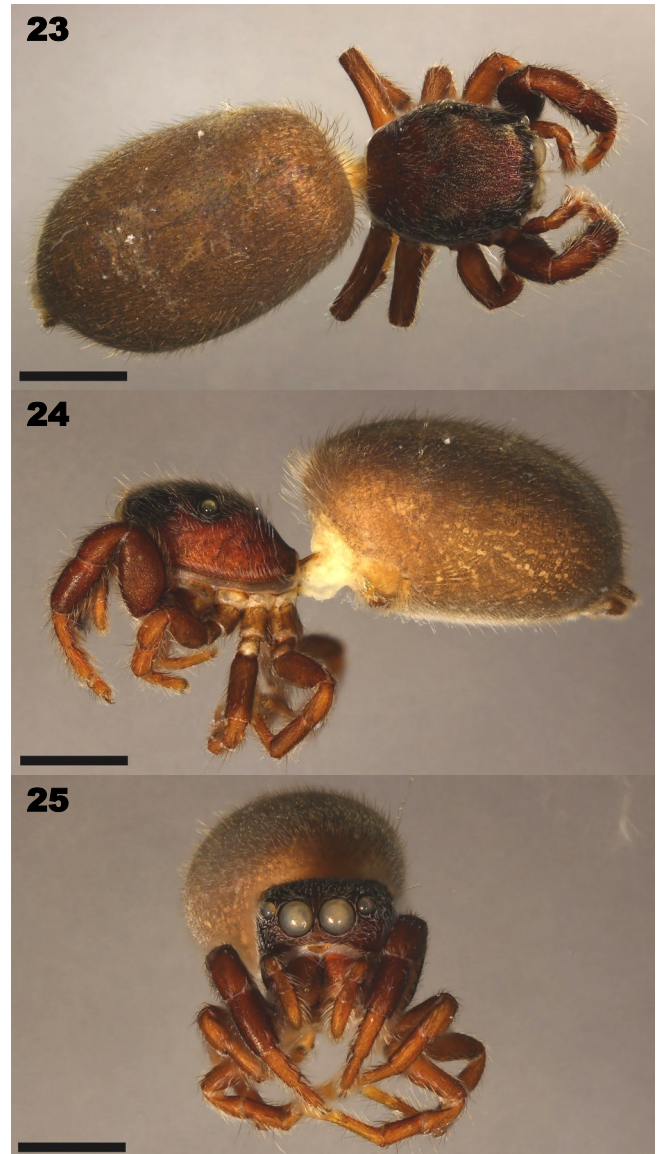
We had both recognised that our Holcroft Moss specimens were *Sibianor larae* because of their distinctive reddish knees on leg I. With this discovery we decided to critically assess some of the records of *S. aurocinctus* on the S.R.S. website, particularly the scattered outlying records in Northern Britain.

Two historic records were of particular interest, given their proximity to Holcroft Moss and their lowland raised



Figures 19–22. Adult female *Sibianor larae* from Holcroft Moss: 19. dorsal; 20. lateral; 21. anterior; 22. ventral view. Scale = 1 mm. © Richard Gallon.

bog habitat. In 1924 Falconer had discovered '*S. aurocinctus*' (then known as *Bianor aenescens*) at Kirkby Moss only 20 km west of Holcroft (Fig. 1). Knowing that Falconer's collection was housed at the World Museum, Liverpool, we contacted Gary Hedges and Tony Hunter to see whether they could locate the original specimens (Figs. 5–7). We were in luck, Tony replied saying he had found the specimen tube containing an adult male and an immature female (dated 8th September 1924). A photograph he sent of the adult male clearly showed the reddish knees typical of *S. larae*. These specimens were

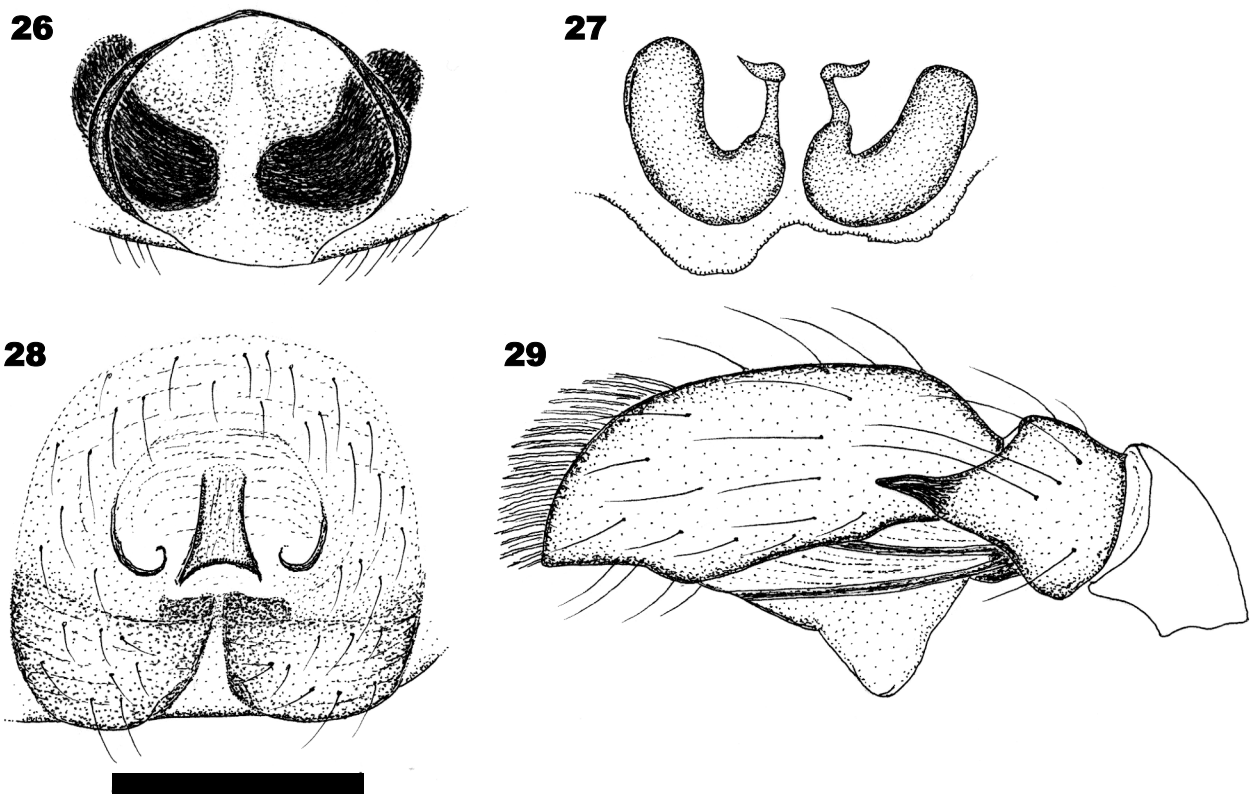


Figures 23–25. Adult female *Sibianor aurocinctus* from Rainham Marshes, Essex: 23. dorsal; 24. lateral; 25. anterior view. Scale = 1 mm. © R. Gallon.

quickly transported to Manchester Museum, where Dmitri Logunov confirmed the identification.

The second historic Mossland record of interest was from Barton Moss, 5 km to the northeast of Holcroft (Bristowe, 1939). Sadly, we cannot find any further detail about Bristowe's record, other than his listing in the *Comity*, and the whereabouts of his specimen/s is unknown. However, we are confident given its proximity to Holcroft and the similar Mossland habitat, that this record is also referable to *S. larae*, rather than *S. aurocinctus*. Kirkby Moss and Barton Moss no longer exist, having been lost to anthropogenic development. S.R.S records of '*S. aurocinctus*' from Thorne Moors and Scotland would be worth re-examining, since these 'bog records' are also likely to represent *S. larae*.

Both sexes of *Sibianor larae* are readily distinguished from those of *Sibianor aurocinctus* by the coloration of their front legs. In *S. aurocinctus* patella I is of a similar colour to femur I (Figs. 16, 18, 24, 25), however in *S. larae* the patella is reddish brown and much paler than the dark femur (Figs. 12, 14, 20, 21). *Sibianor aurocinctus* is more uniformly coloured and less vibrant in its markings. *Sibianor larae* also has numerous reflective scale setae corresponding with two transverse dorsal abdominal bands (Figs. 6, 8), whereas the *S. aurocinctus* material we



Figures 26–29. Salticidae from Holcroft Moss. **26–27** *Heliophanus dampfi* adult female; 26 epigyne, ventral view; 27 epigyne dorsal view. **28–29** *Sibianor laeae*; 28 epigyne, ventral view; 29 palp, retrolateral view. Scale = 0.2 mm. © Richard Gallon

studied has very few of these scale setae in these positions.

The epigynes and palps of the two species differ subtly. Viewed retrolaterally, the anterior face of the tegulum is more steeply declined (relative to the posterior face) in *S. aurocinctus* than in *S. laeae* where the declination of both faces is similar (Logunov, 2001; Vogels, 2012; Tilly, 2015). Dissection/clearing of the epigyne is required to appreciate the internal differences between females of *S. aurocinctus* and *S. laeae* (refer to Logunov, 2001 and Vogels, 2012 for this).

Bristowe (1958) illustrated the mating display of an adult male *Sibianor aurocinctus* (as *Bianor aenescens*) collected from Banstead Downs (Surrey). His two illustrations are intriguing given that they show a spider with pale patellae on the front legs – a characteristic more consistent with *S. laeae* than *S. aurocinctus*. However, this may be down to artistic licence, given that the dry chalk downland habitat there is more typical of *S. aurocinctus*.

#### Site history and recording at Holcroft Moss

The confirmation of *Heliophanus dampfi* and the discovery of *Sibianor laeae* at Holcroft Moss, together with the other species recorded there (Tables 1–3), highlight the national importance of Holcroft Moss' invertebrate fauna. That this important fauna persists at Holcroft Moss is remarkable considering the history of lowland raised bogs in North West England. Figure 1 illustrates the dramatic loss of lowland raised bogs between Manchester and Liverpool – a story that is reflected in other parts of northern England, wherever the habitat occurs.

The history of Holcroft Moss itself – in part illustrated in figure 30 – presents a story of habitat loss, fragmentation and ongoing pressure that is emblematic of

many vanishing wildlife sites up and down the country. Over the last 200 years or so, the original extent of Holcroft Moss – big enough for different parts to have separate identities including Pestfurlong, Risley and Glazebrook Mosses – has been dramatically reduced in extent by drainage, peat cutting and agricultural 'reclamation'. It has been sliced and diced, first by a railway, which came in the 1880s and went in the 1960s, and then by the M62 in the 1970s, cutting through to the north of the current SSSI. The latest pressure comes from HS2 which, it is proposed, will pass along the western edge of the SSSI, close to the original route of the older railway.

Yet despite being squeezed on all sides by grey infrastructure and intensive agriculture, what is left of Holcroft Moss today remains a special place for wildlife as the presence of *H. dampfi* and *S. laeae* attest. Other protected fragments of lowland raised bog in the area, including Lancashire Wildlife Trusts' Astley & Bedford Mosses and Cadishead & Little Woolden Mosses and Warrington Borough Council's Risley Moss, have interesting spider faunas, but none have turned up either of these two species despite being well surveyed over the years.

Interestingly Alan Scott surveyed Holcroft Moss for spiders in 2000 to test a 'short-survey' pitfall trap sampling protocol. Holcroft was compared against a similar survey at Wybunbury Moss in Cheshire carried out in 1999 (Scott *et al.*, 2006). Wybunbury Moss was chosen because it "has probably the most speciose spider fauna in Cheshire" and Holcroft was "chosen as a challenge for the protocol [with] an apparently impoverished fauna". Our surveys of Holcroft in 2018 suggest that the impoverished fauna was more apparent than real. Prior to Alan's 2000 survey all records in the S.R.S. database for the site were made from a number of visits by various

Table 1. Arachnids recorded at Holcroft Moss. Until recently all records from the S.R.S. database were made in 1992, but during the course of research for this article we uncovered Alan Scott's records from 2000 held by Cheshire Record Local Environmental Record Centre which all date from 2000.

Order	Family	Species	1992	2000	2018
Araneae	Amaurobiidae	<i>Amaurobius fenestralis</i>	x		
Araneae	Araneidae	<i>Agalenatea redii</i>			x
Araneae	Araneidae	<i>Araneus diadematus</i>	x		x
Araneae	Araneidae	<i>Araneus quadratus</i>	x		x
Araneae	Araneidae	<i>Araniella cucurbitina s.s.</i>	x		x
Araneae	Araneidae	<i>Gibbaranea gibbosa</i>			x
Araneae	Araneidae	<i>Hypsosinga pygmaea</i>		x	x
Araneae	Araneidae	<i>Larinioides cornutus</i>	x	x	x
Araneae	Araneidae	<i>Neoscona adianta</i>	x	x	x
Araneae	Araneidae	<i>Zygiella atrica</i>			x
Araneae	Clubionidae	<i>Clubiona comta</i>	x	x	x
Araneae	Clubionidae	<i>Clubiona diversa</i>	x	x	x
Araneae	Clubionidae	<i>Clubiona reclusa</i>	x	x	x
Araneae	Clubionidae	<i>Clubiona trivialis</i>	x		x
Araneae	Dictynidae	<i>Dictyna arundinacea</i>	x	x	x
Araneae	Dictynidae	<i>Dictyna uncinata</i>		x	
Araneae	Gnaphosidae	<i>Drassodes cupreus</i>		x	
Araneae	Gnaphosidae	<i>Micaria pulicaria</i>	x	x	x
Araneae	Hahniidae	<i>Antistea elegans</i>		x	x
Araneae	Linyphiidae	<i>Agyneta cauta</i>	x		
Araneae	Linyphiidae	<i>Aphileta misera</i>	x	x	x
Araneae	Linyphiidae	<i>Bathyphantes gracilis</i>	x	x	x
Araneae	Linyphiidae	<i>Centromerita concinna</i>		x	
Araneae	Linyphiidae	<i>Centromerus dilutus</i>	x	x	
Araneae	Linyphiidae	<i>Ceratinella brevipes</i>			x
Araneae	Linyphiidae	<i>Ceratinella brevis</i>	x		x
Araneae	Linyphiidae	<i>Cnephalocotes obscurus</i>		x	x
Araneae	Linyphiidae	<i>Diplocephalus permixtus</i>		x	
Araneae	Linyphiidae	<i>Dismodicus bifrons</i>	x	x	x
Araneae	Linyphiidae	<i>Drapetisca socialis</i>	x		x
Araneae	Linyphiidae	<i>Erigone atra</i>	x	x	x
Araneae	Linyphiidae	<i>Erigone dentipalpis</i>			x
Araneae	Linyphiidae	<i>Gnathonarium dentatum</i>			x
Araneae	Linyphiidae	<i>Gonatium rubens</i>	x		x
Araneae	Linyphiidae	<i>Gongyliellum latebricola</i>	x	x	
Araneae	Linyphiidae	<i>Gongyliellum vivum</i>		x	x
Araneae	Linyphiidae	<i>Gongylidium rufipes</i>	x		
Araneae	Linyphiidae	<i>Hypomma bituberculatum</i>			x
Araneae	Linyphiidae	<i>Kaestneria pullata</i>	x	x	
Araneae	Linyphiidae	<i>Linyphia hortensis</i>	x		
Araneae	Linyphiidae	<i>Linyphia triangularis</i>			x
Araneae	Linyphiidae	<i>Lophomma punctatum</i>			x
Araneae	Linyphiidae	<i>Maro minutus</i>		x	
Araneae	Linyphiidae	<i>Maso sundevalli</i>		x	x
Araneae	Linyphiidae	<i>Meioneta rurestris</i>			x
Araneae	Linyphiidae	<i>Micrargus herbigradus s.s.</i>			x
Araneae	Linyphiidae	<i>Microlinyphia pusilla</i>	x	x	x
Araneae	Linyphiidae	<i>Microneta viaria</i>	x		
Araneae	Linyphiidae	<i>Neriene clathrata</i>	x		x
Araneae	Linyphiidae	<i>Neriene montana</i>			x
Araneae	Linyphiidae	<i>Neriene peltata</i>	x		
Araneae	Linyphiidae	<i>Oedothorax fuscus</i>		x	x
Araneae	Linyphiidae	<i>Oedothorax gibbosus</i>		x	x
Araneae	Linyphiidae	<i>Palliduphantes ericaeus</i>	x	x	x
Araneae	Linyphiidae	<i>Pelecopsis parallela</i>			x

Table 1. continued					
Order	Family	Species	1992	2000	2018
Araneae	Linyphiidae	<i>Pocadicnemis pumila s.s.</i>		x	x
Araneae	Linyphiidae	<i>Porrhomma pygmaeum</i>	x		x
Araneae	Linyphiidae	<i>Saaristoa abnormis</i>		x	
Araneae	Linyphiidae	<i>Silometopus elegans</i>		x	x
Araneae	Linyphiidae	<i>Sintula corniger</i>	x		x
Araneae	Linyphiidae	<i>Stemonyphantes lineatus</i>	x		x
Araneae	Linyphiidae	<i>Tallusia experta</i>		x	
Araneae	Linyphiidae	<i>Tapinocyba pallens</i>	x		x
Araneae	Linyphiidae	<i>Tapinopa longidens</i>			x
Araneae	Linyphiidae	<i>Taranucnus setosus</i>	x		
Araneae	Linyphiidae	<i>Tenuiphantes flavipes</i>			x
Araneae	Linyphiidae	<i>Tenuiphantes mengei</i>	x		x
Araneae	Linyphiidae	<i>Tenuiphantes tenuis</i>		x	x
Araneae	Linyphiidae	<i>Tenuiphantes zimmermanni</i>	x		x
Araneae	Linyphiidae	<i>Walckenaeria acuminata</i>		x	
Araneae	Linyphiidae	<i>Walckenaeria alticeps</i>	x	x	x
Araneae	Linyphiidae	<i>Walckenaeria atrotibialis</i>		x	x
Araneae	Linyphiidae	<i>Walckenaeria dysderoides</i>	x	x	
Araneae	Linyphiidae	<i>Walckenaeria unicornis</i>	x	x	x
Araneae	Linyphiidae	<i>Walckenaeria vigilax</i>		x	x
Araneae	Lycosidae	<i>Alopecosa pulverulenta</i>	x	x	
Araneae	Lycosidae	<i>Pardosa amentata</i>		x	
Araneae	Lycosidae	<i>Pardosa pullata</i>	x	x	x
Araneae	Lycosidae	<i>Pirata latitans</i>			x
Araneae	Lycosidae	<i>Pirata piraticus</i>		x	x
Araneae	Lycosidae	<i>Pirata uliginosus</i>	x	x	x
Araneae	Lycosidae	<i>Trochosa ruficola</i>			x
Araneae	Lycosidae	<i>Trochosa terricola</i>	x	x	x
Araneae	Mimetidae	<i>Ero cambridgei</i>	x	x	x
Araneae	Mimetidae	<i>Ero furcata</i>			x
Araneae	Philodromidae	<i>Philodromus cespitum</i>	x	x	
Araneae	Philodromidae	<i>Tibellus maritimus</i>	x	x	x
Araneae	Philodromidae	<i>Tibellus oblongus</i>	x		x
Araneae	Pisauridae	<i>Pisaura mirabilis</i>		x	x
Araneae	Salticidae	<i>Euophrys frontalis</i>	x	x	x
Araneae	Salticidae	<i>Heliophanus dampfi</i>		x	x
Araneae	Salticidae	<i>Heliophanus flavipes</i>		x	
Araneae	Salticidae	<i>Neon reticulatus</i>	x	x	x
Araneae	Salticidae	<i>Sibianor laeae</i>			x
Araneae	Salticidae	<i>Talavera aequipes</i>			x
Araneae	Tetragnathidae	<i>Metellina mengei</i>	x	x	
Araneae	Tetragnathidae	<i>Metellina merianae</i>	x		
Araneae	Tetragnathidae	<i>Metellina segmentata</i>	x		x
Araneae	Tetragnathidae	<i>Pachygnatha clercki</i>	x		
Araneae	Tetragnathidae	<i>Pachygnatha degeeri</i>	x	x	x
Araneae	Tetragnathidae	<i>Tetragnatha extensa</i>	x	x	x
Araneae	Tetragnathidae	<i>Tetragnatha montana</i>			x
Araneae	Tetragnathidae	<i>Tetragnatha nigrita</i>			x
Araneae	Theridiidae	<i>Achaearenea simulans</i>			x
Araneae	Theridiidae	<i>Anelosimus vittatus</i>	x		
Araneae	Theridiidae	<i>Enoplognatha latimana</i>			x
Araneae	Theridiidae	<i>Enoplognatha ovata</i>	x	x	x
Araneae	Theridiidae	<i>Episinus angulatus</i>	x		
Araneae	Theridiidae	<i>Euryopsis flavomaculata</i>		x	x
Araneae	Theridiidae	<i>Neottiura bimaculata</i>	x	x	x
Araneae	Theridiidae	<i>Paidiscura pallens</i>	x		x
Araneae	Theridiidae	<i>Pholcomma gibbum</i>	x		x

Table 1. continued					
Order	Family	Species	1992	2000	2018
Araneae	Theridiidae	<i>Phylloneta impressa</i>			x
Araneae	Theridiidae	<i>Phylloneta sisyphia</i>	x		x
Araneae	Theridiidae	<i>Robertus arundineti</i>		x	x
Araneae	Theridiidae	<i>Robertus lividus</i>			x
Araneae	Theridiidae	<i>Steatoda bipunctata</i>	x		
Araneae	Theridiidae	<i>Theridion pictum</i>			x
Araneae	Thomisidae	<i>Ozyptila trux</i>	x	x	x
Araneae	Thomisidae	<i>Xysticus cristatus</i>	x	x	x
Araneae	Zoridae	<i>Zora spinimana</i>	x	x	x
Opiliones	Phalangiidae	<i>Dicranopalpus</i> sp.			x
Opiliones	Phalangiidae	<i>Leiobunum blackwalli</i>			x
Opiliones	Phalangiidae	<i>Leiobunum rotundum</i>			x
Opiliones	Phalangiidae	<i>Paroligolophus agrestis</i>			x
Opiliones	Phalangiidae	<i>Platybunus triangularis</i>			x
Pseudoscorpiones	Neobisiidae	<i>Neobisium carcinoides</i>			x
<b>Total 127</b>			<b>67</b>	<b>63</b>	<b>98</b>

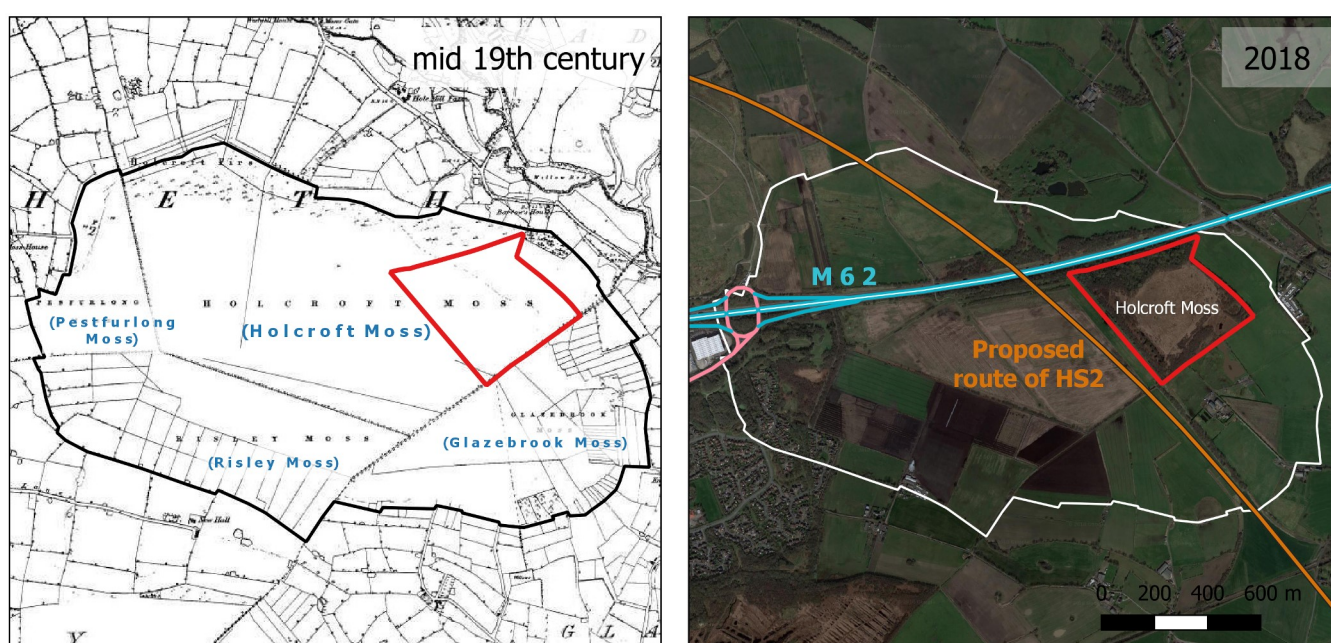


Figure 30. This pair of images illustrates habitat loss and fragmentation over the last 150 years or so at Holcroft Moss. The figure also indicates the proposed route of the HS2 phase 2B ([www.hs2.org.uk/where/route-map](http://www.hs2.org.uk/where/route-map)).

arachnologists in 1992 (Table 1). Somehow Alan’s Holcroft records did not find their way into the S.R.S. database, although they were captured by Cheshire Record (these missing records will now be added to the S.R.S. database).

It is highly likely that *H. dampfi* and *S. laeae* occurred on other mosses in the area. This is supported by the historic record of *S. laeae* from the lost site of Kirkby & Simonswood Mosses. Why have these species hung on at Holcroft Moss but apparently nowhere else? Perhaps the key is the unusually low level of modification, including the absence of peat cutting on the remaining area of Holcroft Moss.

If projects such as the *Carbon Landscape* can accelerate the excellent work already done to restore the condition of lowland raised bogs across the area, and if Holcroft itself can withstand the pressure from altered hydrology, habitat fragmentation and continuing infrastructure projects, perhaps the relict populations of *H. dampfi* and *S. laeae* could, once again, spread across the mosslands of north west England. We live in hope!

Voucher material of *Sibianor laeae* and *Heliophanus dampfi* will be deposited in the World Museum, Liverpool and Oxford University Museum of Natural History.

**Acknowledgements**

We would like to thank Gary Hedges (Tanyptera Trust, World Museum Liverpool) for the provision of grants supporting the purchase of a G-vac for RB and survey travel expenses for RG. The BioLinks project allowed RB to devote some work time to spider survey work. Tony Hunter is thanked for locating historical specimens and information in the World Museum, Liverpool collection. Dmitri Logunov is thanked for kindly confirming the identification of *Sibianor laeae*. Sarah Bennett and the Cheshire Wildlife Trust are thanks for allowing us to survey Holcroft Moss.

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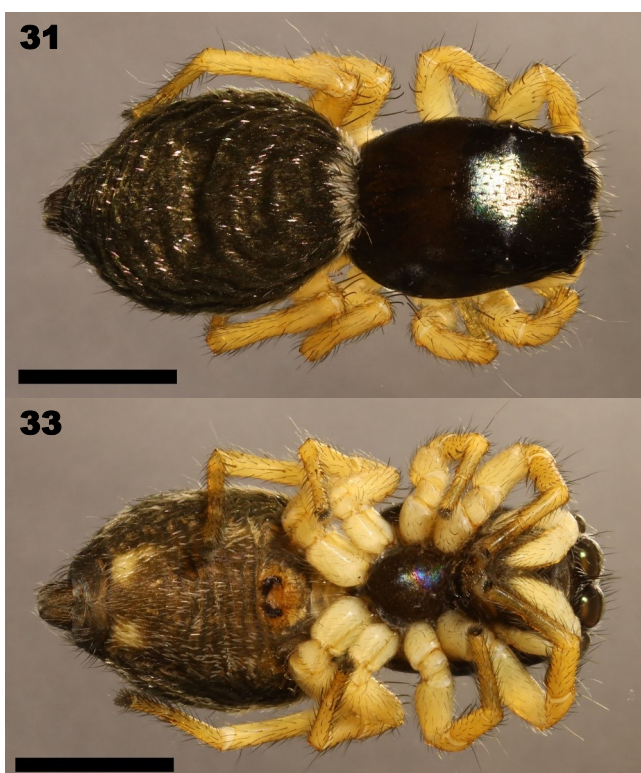
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Table 2. *Sibianor lae* records from Holcroft Moss in 2018. i = immature. Only a few vouchers were collected.

Sex	Date	Grid reference	Habitat	Notes
1♀	14/06/2018	SJ68719324	Heathland	G-vac
1i	28/07/2018	SJ68509326	<i>Molinia</i>	G-vac
1♀ 3i♂ 2i♀ 4i	28/07/2018	SJ68719325	Heathland	G-vac
1i♀ 1i	28/07/2018	SJ68629324	Bunded bog	G-vac
1♂	15/09/2018	SJ68599314	Heathland	G-vac
1i♂	15/09/2018	SJ68709324	Heathland	G-vac
1♂ 1♀ 1i♂ 1i♀ 14i	15/09/2018	SJ68719325	Heathland	G-vac
1♂ 1i♀	15/09/2018	SJ68309331	Heather and <i>Molinia</i>	G-vac
3♂ 3i	15/09/2018	SJ68539312	Bunded bog. Heather/ <i>Molinia</i> islands in crusty peat	G-vac
1♂	15/09/2018	SJ68619312	Heather & <i>Eriophorum angustifolium</i>	G-vac
1i♀	15/09/2018	SJ68589333	<i>Molinia</i> & <i>Polytrichum</i>	G-vac

Table 3. *Heliophanus dampfi* records from Holcroft Moss in 2018. i = immature.

Sex	Date	Grid reference	Habitat	Notes
3i	14/06/2018	SJ68719324	Heather and <i>Eriophorum</i>	Gvac
1♀	14/06/2018	SJ68619323	Bunded bog	Gvac
1♀ 2i♂ 6i♀ 6i	28/07/2018	SJ68719325	Heathland	G-vac
1♀ 5i	28/07/2018	SJ68589320	Bunded bog	Gvac
3i	28/07/2018	SJ68429322	<i>Sphagnum</i> , <i>Eriophorum</i> and <i>Vaccinium oxycoccos</i>	Gvac
1i♂	28/07/2018	SJ68639334	<i>Molinia</i>	Gvac
2i	28/07/2018	SJ68719325	Heathland	Sweeping heather
13i	28/07/2018	SJ68629324	Bunded bog	Gvac
5i♂ 1i♀ 6i	15/09/2018	SJ68719325	Heathland	G-vac
1i♂	15/09/2018	SJ68719325	Heathland	Sweeping heather
2i♀	15/09/2018	SJ68309331	Heather and <i>Molinia</i>	G-vac
3i♂ 2i♀	15/09/2018	SJ68539312	Bunded bog. Heather/ <i>Molinia</i> islands in crusty peat	G-vac
1i♂	15/09/2018	SJ68619312	Heather & <i>Eriophorum angustifolium</i>	G-vac
2i	15/09/2018	SJ68709324	Heathland	Gvac
7i	15/09/2018	SJ68599314	Heathland	Gvac

Figures 31–34. Adult female *Heliophanus dampfi* from Holcroft Moss: 31. dorsal; 32. lateral; 33. ventral; 34. anterior view. Scale = 1 mm. © Gallon.

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## Upcycled Ceiling Lampshade – Tullgren Funnel

by Nigel Cane-Honeysett

Inspired by various TV programmes I have tried my hand at upcycling to produce a smart and attractive ceiling light (Fig. 1).

The lampshade comprises an inverted plastic paint pot with a hole drilled into the base to accommodate the lampshade holder (with a few extra holes to dissipate excess heat). A small plastic garden sieve is then taped



Figure 1. Tullgren Funnel light fitting.  
© Nigel Cane-Honeysett

over the top of a motor oil funnel, such that this unit can be pushed into the paint pot and held in place by friction. An appropriately sized Eppendorf tube is then pushed onto the funnel base.

I'm sure you will agree that it would enhance the decor of any room, particularly if the optional extra of a few handfuls of leaf litter are placed artistically on the sieve before assembly. Since the construction relies on friction to hold it together, it can be easily dismantled to refresh the leaf litter when desired.

The Eppendorf tube can be filled with all kinds of scented oils or other volatile fluids to further enhance the ambience of the room where it is situated! I find 70% IDA particularly pleasing. The only slight problem I have encountered is that the Eppendorf tube needs emptying once in a while as it tends to collect all kinds of small invertebrates.

Acting on feedback from my wife, I can confirm that it can be easily removed and reassembled in a different room (e.g. garage) in the unlikely event that not everyone in the house appreciates its simple beauty.

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## A Mutual Relationship Between *Synema globosum* (Thomisidae) and *Erophaca baetica* (Iberian Milk-vetch)?

by Tristan J. Canterbury

As part of our second year studying zoology at the University of Sussex, Jay Pusley and I visited Aljezur in southern Portugal, where we would investigate the effects of crab spiders as predators of florivores. Our interests differ slightly, with Jay being particularly interested in social insects and behavioural ecology and myself being rather spider obsessed and interested in quantitative methods in ecology. Together we had passion for all parts of this project.

On arrival in Portugal (March 2018) we were met with a cool breeze – pleasant enough. However, this was a strong wind by the time we arrived at the Aljezur coastline. These conditions were not the Mediterranean bee heaven we were anticipating, and we found our study habitat barren of the rockrose we originally came to study. So, our investigation changed from studying the foraging behaviour of bees in response to *Misumena vatia* to having no idea what to do.

As fans of spiders we decided to use this opportunity to shine a more positive light on their predatory behaviour. Smaller Thomisidae may be beneficial to plants by reducing the impact of invertebrate herbivores (florivores) (Anina *et al.*, 2018; Romero & Vasconcellos-Neto, 2004). We predicted that spider density would negatively correlate with herbivore densities in the early growing season, when many spiders are immature and so predate on smaller species (Cloyd, 2016).

An initial survey of the community around the inflorescences of *Erophaca baetica*, a poisonous legume, was carried out by close, 5-minute-long inspections of 45 randomly sampled patches, to prevent disturbance prior to the field experiment.

This initial survey revealed a high abundance of thrips and beetles and enough crab spiders for an experiment (Fig. 3). We chose to experimentally change the presence of these crab spiders to study their effects on the florivore community.



Figure 1. Jay collecting spiders for a yet unknown experiment.

The control variable in this field experiment was the number of Thomisidae per patch of *E. baetica*. A patch comprising of between three and six bunches of inflorescences. Almost all the Thomisidae present were sub-adult or adult *Synema globosum*, but there were also juvenile *Misumena vatia* of around the same size that we



Figure 2. Me satisfied with an experimental patch prototype.

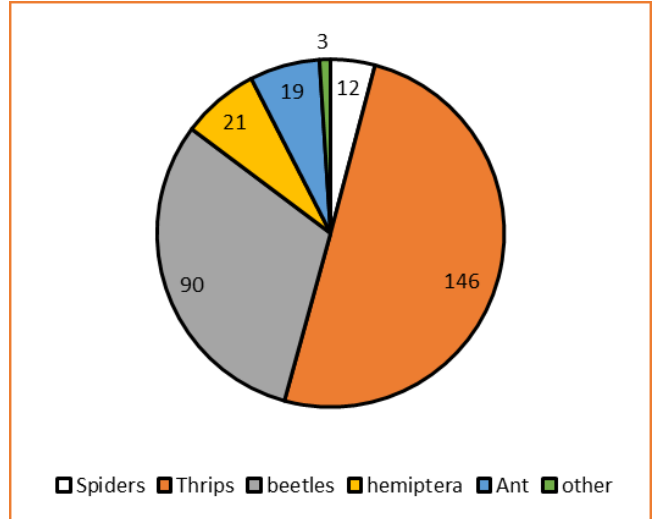


Figure 3. Arthropod abundance across 45 randomly sampled *E. baetica* inflorescences.

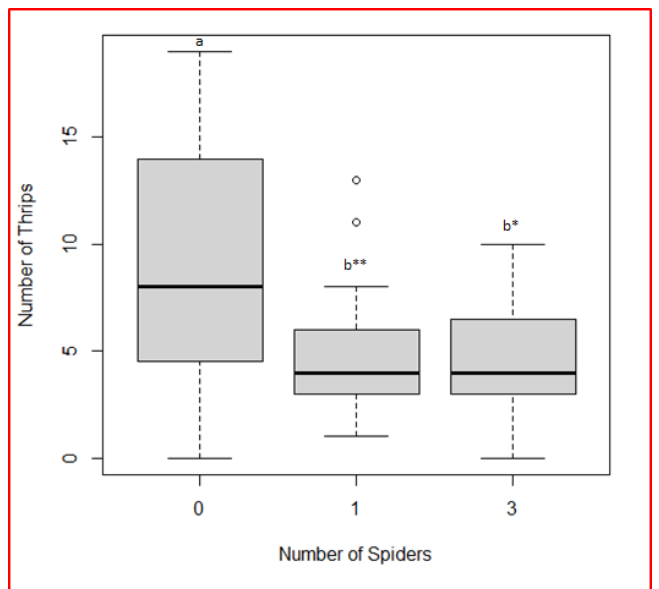


Figure 4. Thrip abundance plotted against three experimental treatments. Outliers, range, interquartile range and median number of thrips are plotted for each experimental group (0 spiders, 1 spider and 3 spiders). “a” and “b” are significantly different, \*\* =  $p < 0.005$ , \* =  $p < 0.05$ .

assume play a similar role in the community. We controlled the starting number of Thomisidae each night and recorded the response at 2:00 pm the next day. Patches were chosen arbitrarily due to their infrequency and assigned a treatment randomly within each of eight locations for the duration of the experiment.

As shown in figures 4 and 5, thrip abundance and taxa richness, measured by number of insect orders, were significantly lower when *S. globosum* was present. This indicates that they act as effective controllers of thrip numbers and influence the overall species diversity on plants. *Synema globosum* may therefore reduce damage to *E. baetica* from species that can often be pests to plants (Cloyd, 2016; Zrubecz *et al.*, 2007).

Whilst we assume that changes in the number of spiders was due to migration; cannibalism, interspecific predation and other factors likely played a role (Wise, 1993). Migrations were occasionally observed as they occurred (Fig. 6). However, where individuals had gone

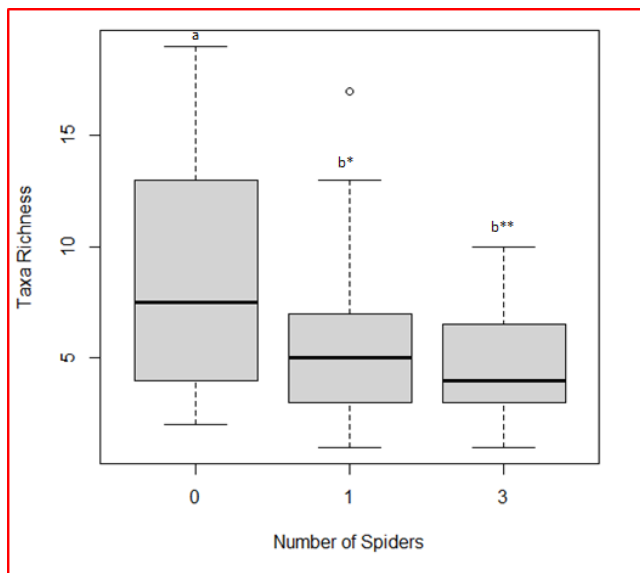


Figure 5. Taxa richness plotted against three experimental treatments. See figure 4 for explanation of the treatments. "a" and "b" are significantly different, \*\* =  $p < 0.005$ , \* =  $p < 0.05$ .

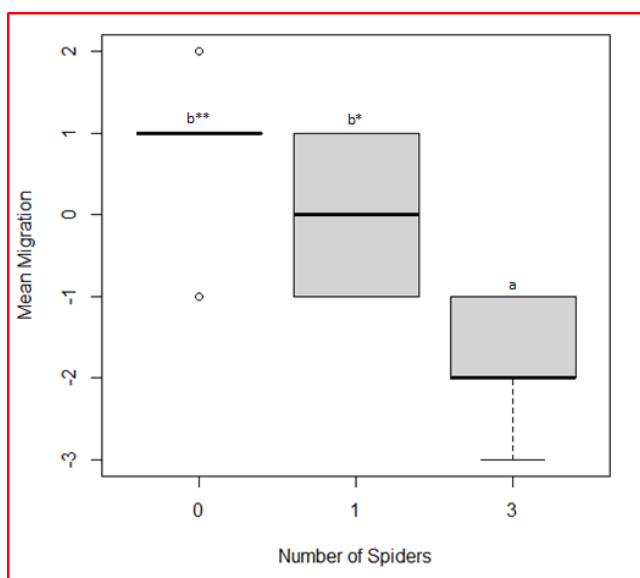


Figure 6. Mean migration of Thomisidae plotted against three experimental treatments. See figure 4 for explanation of the treatments. A negative value means emigration and a positive value means immigration "a" and "b" are significantly different, \*\* =  $p < 0.005$ , \* =  $p < 0.05$ .

missing, we often found similar individuals in nearby inflorescences alongside trails of silk left overnight. The tendency for migration out of the patches was significantly higher in the third treatment suggesting that they behaviourally avoid being at high densities, possibly to avoid cannibalism or competition.

Our investigation provides indirect evidence for a mutualistic relationship between *S. globosum* and juvenile *M. vatia* species and the legume, *E. baetica*, via predation on pest herbivore species. Our data is consistent with the hypothesis that plants can benefit from high spider densities during the growing season, when pollination rates are lower and energy demands are higher (Lang *et al.*, 1999; Snyder & Wise, 1999). Investigating different plant communities may reveal that different spider and plant species will have different interactions depending on

their respective phenologies. So, investigations like this may help to predict the effects of climate change on biodiversity (Walther *et al.*, 2002).

What I learned from this experience is that controlling spider densities is a lot of work, too much exercise perhaps for myself, but studying spiders in this way is both possible and entertaining!

This study was presented as a poster at the 2018 European Congress of Arachnology, Vác, Hungary. My attendance at the Congress was supported by a British Arachnological Society Ted Locket Grant award.

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## Obituary: David Haigh 1938–2017

Gloucestershire lost one of its real natural history characters on the 27th October 2017 with the death of David Haigh. David was born in Scotland, moving to Birmingham with his family, where he attended Grammar School in West Bromwich before going on to Aberystwyth to read Botany (with Geology and Zoology). Having returned to teach at his old school for a number of years he moved to Cheltenham in 1965 to teach biology at what is now Bournside School.



David joined the Gloucestershire Naturalists' Society in 1967 and started recording the county's spiders, later becoming county recorder and the British Arachnological Society's Area Organiser for Vice Counties 33 and 34 (East and West Gloucestershire). For a time he was also the county recorder for Woodlice and Harvestmen. As an active member of the Gloucestershire Invertebrate Group, he led many of its field meetings. He joined forces with fellow recorder, David Long (molluscs), to carry out surveys on nature reserves for the Gloucestershire Wildlife Trust. He also served as Secretary to the G.N.S.'s Scientific and Publications Subcommittee for an impressive 16 years.

David was always recognisable in the field, often wearing his wellingtons and windproof jacket, a hat if it was very sunny, and a backpack, and carrying a sweep net and beating stick, a carrier bag containing his green plastic sieve and white bin lid used for sorting the catch. A bumbag containing tubes of spirit for any specimens required for determination later under the microscope. His other indispensable piece of kit, usually hanging from his mouth, was his pooter.

David was a very good, all-round, field naturalist and his generosity with his knowledge was complemented by his teaching skills when surrounded by young and old alike on field meetings. He often helped out at G.N.S. Bughunts and local WATCH groups and nearly always had a crowd of followers. He contributed many articles to The Gloucestershire Naturalist and to the B.A.S. Newsletter. He generated thousands of spider records over the years and kept them in an index card system, as he never mastered digital recording programmes. Once digitised his records will be sent to the Spider Recording Scheme.

## Learning to Love Spiders and More

by Keith Elder

Spiders didn't get a mention during my biology undergraduate degree course in the late 1960s, because, I think, spiders were perceived as having no economic importance. As I recall, the invertebrate courses I attended were dominated by insects, marine and freshwater invertebrates, and the various invertebrate groups that carried human diseases.

But for me spiders have always been source of fascination. However, beyond House spiders (*Tegenaria* spp.) and the Garden Spider (*Araneus diadematus*), which have always been very familiar from childhood, around the home and in the garden, I knew nothing of the 660 plus other species in the UK. So, when the Field Studies Council (FSC) advertised a *Learn to Love Spiders* day at their Preston Montford Field Centre near Shrewsbury two years ago, I leapt at the opportunity to find out more.

The enthusiasm of tutors, Nigel Cane-Honeysett and Dr Richard Burkmar, and the opportunity to begin guided identification in the field proved a good foundation to find out more during an FSC *Spider Field ID* course later in the year. I have since attended an *Introduction to Pseudoscorpions* day at Liverpool's World Museum in conjunction with Cofnod and an FSC *Pseudoscorpions ID* day course at Preston Montford. The FSC day courses, supported through the BioLinks project ([www.fscbiodiversity.uk](http://www.fscbiodiversity.uk)), are not only instructional but bring likeminded people together and are ideal for the enthusiast who wants to learn about invertebrate identification.

Returning home after the *Spider ID* course, I discovered my first 'new to me' spider, a Daddy Long-legs Spider (*Pholcus phalangioides*) hanging from the ceiling in the entrance to my daughter's house (Fig. 1). Its long legs and cylindrical body, hanging upside down from the ceiling, make this spider very obvious, but I hadn't noticed it during the numerous times I had previously entered the house. I would imagine 'in plain sight but unseen' is common for many invertebrates.

Village halls, I have since discovered, are a fruitful location for Daddy Long-legs Spiders with the high ceilings of toilet cubicles busy, if that's not the wrong word to use for a spider which shows little or no

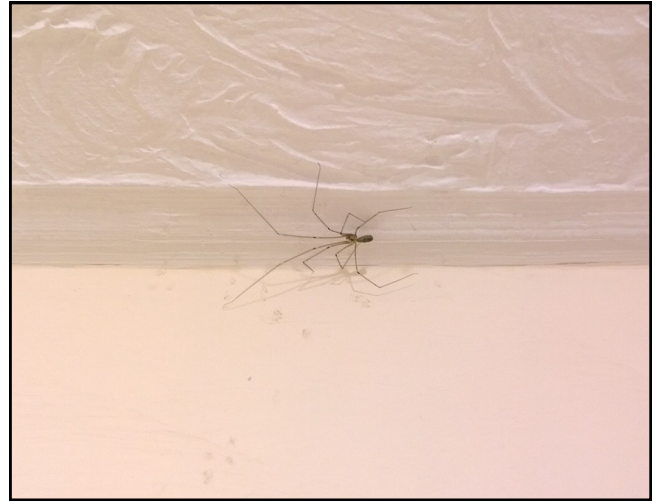


Figure 1. *Pholcus phalangioides*. © Keith Elder.

discernible movement or activity week after week. Also, in my enthusiasm for this 'new to me' spider I noticed its innocent presence on entering a local craft shop, high above the stocks of yarn. I then made the not-to-be-repeated mistake of pointing it out to the shopkeeper. I knew by her reaction that its undisturbed life would soon be a thing of the past. Lesson learnt, although educating people that spiders are to be enjoyed and not feared must be a role for B.A.S. members.

I've gone on to discover some of the other 660 or so species using my WILDGuide book, *Britain's Spiders*. There are many more to find. Now it's up to me to use my eyes.

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## Observations of *Amaurobius similis* Feeding on Banana (fruit of *Musa* sp.) and *Vespula vulgaris* (common wasp) in Scotland

by Chris Cathrine

The author has recently observed two interesting feeding behaviours in *Amaurobius similis* in Stirlingshire (VC86) and West Perthshire (VC87): immobilisation of a *Vespula vulgaris* (common wasp) and feeding on banana (fruit of *Musa* sp.).

*Amaurobius similis* build webs from cribellate silk, often around window frames and other structures, which they use to capture prey. They are common in the Caledonian Conservation Ltd. office, near Bridge of Allan, Stirlingshire, which is within an old converted farm building at Keir and Cawdor Estates. On 16th September 2016 a female *A. similis* was observed to capture a *V. vulgaris* (common wasp). The spider emerged from its retreat when the *V. vulgaris* became entangled and approached from the abdomen of the prey. The spider then proceeded to work around the stinger, which the wasp was thrusting frantically, by making repeated punctures with its fangs. The thrusts of the wasp's abdomen became weaker at which point the spider moved to the thorax and made a final puncture before moving away. The *A. similis* then waited for the *V. vulgaris* to become motionless, before returning to feed on its immobilised prey. The spider appeared to employ a strategy of disarming the wasp's stinger before treating it similarly to any other

prey item. It would be interesting to explore this behaviour further, to try to determine if it is innate or learned.

While *Amaurobius* spp. are predators, the author has observed male *A. similis* feeding on fruit in his previous home in Doune, Perthshire, and his current home in Stirling. On several occasions, male *A. similis* have been observed feeding on banana (fruit of *Musa* sp.) left on the author's kitchen table, prior to clearing. The spiders stand over mushy sections of the fruit and use their chelicerae and palps to manipulate small portions in to their mouths. Whether this is for sustenance or moisture is unclear. Furthermore, this has only been observed by the author during winter months (November, December, and January). The author has observed this behaviour each year in Doune (2014–2018) and now Stirling (2018–present). Female *A. similis* have not been observed feeding on bananas – this may be due to their more sedentary nature making encounters unlikely, whereas males leave their webs in search of mates and will roam more widely, feeding opportunistically.

Despite reports of spiders from a range of families feeding on a variety of plant matter, there appears to be no published account of fruit ingestion, although they have been observed to feed on plant-associated liquids with high sugar content (e.g. nectar, stigmatic exudate, and honeydew) (Nyffler *et al.*, 2016). However, Sean McCann observed an araneid feeding on papaya in French Guiana in 2010 (Sean McCann, pers. comm. 10 January 2019). Once considered uncommon, nectar feeding is now thought to be a relatively general behaviour in spiders from a number of families, and accounts for ~75% of reported plant feeding incidents (Taylor & Pfannenstiel, 2009; Nyffler *et al.*, 2016). Due to their biology, spiders are unable to digest solid particulates internally, however the mushy banana matter observed to be ingested by *A. similis* may be similar in consistency to sugary liquids, such as nectar.

Nyffler *et al.* (2016) found that more than 80% of reported incidents of spiders feeding on plant matter could be attributed to the families Anyphaenidae, Clubionidae, Eutichuridae, Salticidae, Thomisidae and Trachelidae. There do not appear to be any published accounts of Amaurobiidae ingesting plant matter. Therefore, this appears to be the first published record of spiders eating fruit, and a member of the Amaurobiidae family ingesting plant matter.

### Acknowledgements

The author is grateful to Catherine Scott and Sean McCann for providing information on other observations of spiders eating fruit. He would also like to thank his children, Logan and Ross Cathrine, for leaving pieces of mashed banana out on his kitchen table, leading to these observations of *Amaurobius similis* feeding on fruit.

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## British Arachnological Society Survey of Clumber Park for *Thanatus formicinus* (Clerck, 1757) 19th–21st October 2018

by Richard Gallon\*, Geoff Oxford<sup>o</sup> & Bill Parker<sup>o</sup>

Following the discovery of *Thanatus formicinus* (Clerck, 1757) in September 2017 at Clumber Park, Nottinghamshire, Helen Smith (B.A.S. Conservation Officer) was approached by Carl Hawke (National Trust) to undertake a survey for the species. *Thanatus formicinus* had been listed as *Critically Endangered (Possibly Extinct)* in the recent status review of British spiders (Harvey *et al.*, 2017), but to everybody's surprise was discovered at Clumber Park later that same year.

Previous British records of *T. formicinus* were from the Ashdown Forest (Sussex) and Beaulieu Heath (Hampshire), with their most recent sightings in 1969 and 1894 respectively. It was therefore a huge relief when Lucy Stockton, accompanied by Trevor Harris, discovered a female specimen at Clumber Park on the 7th September 2017 (Stockton, 2017). Not only was this a new locality for the species in Britain but it also represented a significant range extension, being 300 km north of previous sites.

RG, GO and BP volunteered to conduct the Clumber Park survey in late October 2018 with the aim of understanding better the distribution and habitat preferences of *T. formicinus* across this extensive 1500 ha site. The plan was to arrive on Friday afternoon and spend the weekend undertaking survey work in the Park (19th–21st October 2018), staying in a bunkhouse provided by the Trust. However, at the eleventh hour, we learnt our accommodation had been attacked by arsonists, but the Trust had kindly arranged for us to stay at the Lock Keeper Inn at Worksop.

The three of us rendezvoused at the Inn on Friday afternoon and then drove down to Clumber Park to meet Gareth Jones, Clumber's Lead Ranger. Gareth gave us some background information and furnished us with site maps, before leading us down to where Lucy had discovered the original specimen (Fig. 1). The site was an area of heather heath over sandy soil stretching along a shallow depression known as The Long Valley. We were surprised to hear that only 18 years previously the area was a closely mown carpark; hardly the pristine age-old habitat you would expect a rare spider to inhabit.



Figure 1. Bill, Gareth with his daughter, and Geoff grubbing at the original Long Valley *Thanatus formicinus* site (19th October 2018). © R. Gallon.



Figure 2. Geoff Oxford grubbing for *Thanatus formicinus* at the original Long Valley site (20th October 2018). © Richard Gallon.



Figure 5. Adult female *Thanatus formicinus* from Long Valley Clumber Park, with the mosses *Dicranum scoparium* and *Pleurozium schreberi* which cover the sandy ground below the heather. © Richard Gallon.



Figure 3. Adult female *Thanatus formicinus* in a vacuum sample at the original Long Valley site (20th October 2018). Note the characteristic cryptic hunched-up behaviour. © Richard Gallon.



Figure 4. During the survey immature *Thanatus striatus* were discovered at several sites throughout Clumber Park, including those supporting *T. formicinus*. © Richard Gallon.



Figure 6. Geoff Oxford finds a rich seam of *T. formicinus* at a new location within Clumber Park, 750 m northeast of its original site (20th October 2018). © Richard Gallon.

We had not intended to start surveying on the Friday evening recce (leaving the serious sampling gear back at the Inn), but the temptation was too great. Gareth left us grubbing amongst the heather, but five or so minutes later we had encountered our first adult female *Thanatus formicinus*, amongst numerous, confusingly similar-looking immature *Pisaura mirabilis*. The pressure was off, so we retired to the Inn to celebrate our success over dinner.

Saturday morning found us back at the original heathland site, where Gareth introduced us to Trevor

Sex	Grid Reference	Location	Date
1♀	SK63197414	The Long Valley (ex. car park)	19/10/2018
3♀	SK63207414	The Long Valley (ex. car park)	20/10/2018
1i♂	SK6321074137	The Long Valley (ex. car park)	20/10/2018
1♀	SK6378974459	The Long Valley (ex. football pitch)	20/10/2018
1i♂	SK6378974458	The Long Valley (ex. football pitch)	20/10/2018
1i♂	SK6379074456	The Long Valley (ex. football pitch)	20/10/2018
1♀	SK6378774460	The Long Valley (ex. football pitch)	20/10/2018
1i♂	SK6378974459	The Long Valley (ex. football pitch)	20/10/2018
1i♂	SK6351773998	The Long Valley (midway)	21/10/2018



Figure 7. Bill Parker investigating a line of old-growth heather at The Lings (20th October 2018). *Thanatus formicinus* was not found here, although its smaller congener *T. striatus* was located at this spot. © Richard Gallon.



Figure 8. Gareth Jones grubbing at Thoresby Road Heath (20th October 2018). A promising looking site, but no *T. formicinus* were found here. © R. Gallon.

Harris. Trevor regaled us with information about the original discovery, highlighting areas where further specimens had been discovered since (although these were all within several metres of the original spot). Trevor left us to get on with the survey work (Fig. 2). Three adult females were vacuumed (Figs. 3 & 5), and a single sub-adult male grubbed from the original site on the Saturday morning (20th October).

Gareth informed us that the Trust had seeded the original *Thanatus* site with heather mowings gathered from a site 750 m northeast along the same valley, so we were keen to survey this area next. The second location was a former football pitch used by sawmill workers, but had since reverted to heather heathland (Fig. 6). This site yielded two adult female and four sub-adult male *T. formicinus* by grubbing beneath heather. Two additional heather-rich sites in the Park were surveyed on the Saturday; The Lings (Fig. 7) and Thoresby Road Heath (Fig. 8), but neither produced *T. formicinus*.

On Sunday morning we returned to The Long Valley to release one of the live adult females we had collected there the previous day. Taking the opportunity to sample an area midway between the two Long Valley *T. formicinus* sites we discovered a single sub-adult male *T. formicinus* under a small patch of heather (Fig. 9). Four further sites were sampled across the Park targeting a range of habitats to record a wide variety of spider



Figure 9. A single sub-adult male *T. formicinus* was found in a small clump of heather here (21st October 2018). This site was midway between the two main *T. formicinus* locations in The Long Valley suggesting a single population extending along the valley floor. © Richard Gallon.

species: Office buildings & garden; Hardwick Wood (Fig. 10); The Wetlands; Lamb House Heath (Fig. 11). No further *T. formicinus* were encountered at these sites.

In total we surveyed 10 sites across Clumber Park (Fig. 12), recording 12 *Thanatus formicinus* at three

Table 2. Arachnids recorded at Clumber Park survey sites, including spiders previous recorded from the Park.

Family	Species	H & SRS	LVc	LVf	LVm	LVs	Li	Th	Bu	Ha	We	La
<b>Spiders</b>												
Agelenidae	<i>Agelena labyrinthica</i>	x										
Agelenidae	<i>Eratigena agrestis</i>	x										
Agelenidae	<i>Eratigena duellica</i>	x	x									
Agelenidae	<i>Eratigena saeva</i>	x										
Agelenidae	<i>Tegenaria domestica</i>	x										
Agelenidae	<i>Textrix denticulata</i>	x										
Amaurobiidae	<i>Amaurobius fenestralis</i>	x	x							x		
Amaurobiidae	<i>Amaurobius ferox</i>	x										
Amaurobiidae	<i>Amaurobius similis</i>	x							x			
Anyphaenidae	<i>Anyphaena accentuata</i>	x								x		
Araneidae	<i>Araneus diadematus</i>	x				x				x		
Araneidae	<i>Araneus marmoreus</i> var. <i>marmoreus</i>	x										
Araneidae	<i>Araneus marmoreus</i> var. <i>pyramidatus</i>	x										
Araneidae	<i>Araneus quadratus</i>	x	x									
Araneidae	<i>Araneus sturmi</i>	x										
Araneidae	<i>Araniella cucurbitina</i>	x										
Araneidae	<i>Araniella opisthographa</i>	x										
Araneidae	<i>Cercidia prominens</i>	x	x	x			x					
Araneidae	<i>Cyclosa conica</i>	x								x		
Araneidae	<i>Gibbaranea gibbosa</i>	x										
Araneidae	<i>Hypsosinga albovittata</i>	x	x	x								
Araneidae	<i>Hypsosinga pygmaea</i>	x										
Araneidae	<i>Larinioides cornutus</i>	x									x	
Araneidae	<i>Larinioides patagiatus</i>	x										
Araneidae	<i>Larinioides sclopetarius</i>	x										
Araneidae	<i>Nuctenea umbratica</i>	x	x									
Araneidae	<i>Zygiella atrica</i>	x										
Araneidae	<i>Zygiella x-notata</i>	x							x			
Clubionidae	<i>Cheiracanthium erraticum</i>	x										
Clubionidae	<i>Cheiracanthium virescens</i>	x										
Clubionidae	<i>Clubiona brevipes</i>	x										
Clubionidae	<i>Clubiona comta</i>	x								x		
Clubionidae	<i>Clubiona corticalis</i>	x										
Clubionidae	<i>Clubiona diversa</i>	x						x				
Clubionidae	<i>Clubiona lutescens</i>	x										
Clubionidae	<i>Clubiona neglecta</i>	x										
Clubionidae	<i>Clubiona pallidula</i>	x										
Clubionidae	<i>Clubiona phragmitis</i>	x										
Clubionidae	<i>Clubiona reclusa</i>	x										
Clubionidae	<i>Clubiona stagnatilis</i>										x	
Clubionidae	<i>Clubiona terrestris</i>	x										
Dictynidae	<i>Cryphoeca silvicola</i>	x										
Dictynidae	<i>Dictyna arundinacea</i>	x										
Dictynidae	<i>Dictyna uncinata</i>	x										
Dictynidae	<i>Lathys humilis</i>	x								x		
Dictynidae	<i>Nigma puella</i>	x										
Dysderidae	<i>Harpactea hombergi</i>	x								x		
Gnaphosidae	<i>Drassodes cupreus</i>	x										
Gnaphosidae	<i>Drassodes pubescens</i>	x										
Gnaphosidae	<i>Drassyllus pusillus</i>	x										
Gnaphosidae	<i>Haplodrassus signifer</i>	x										
Gnaphosidae	<i>Micaria pulicaria</i>	x										
Gnaphosidae	<i>Scotophaeus blackwalli</i>	x										
Gnaphosidae	<i>Zelotes latreillei</i>	x										
Hahniidae	<i>Antistea elegans</i>	x									x	

Table 2. continued.

Family	Species	H & SRS	LVc	LVf	LVm	LVs	Li	Th	Bu	Ha	We	La
Hahniidae	<i>Hahnia helveola</i>	x										
Hahniidae	<i>Hahnia montana</i>	x										
Linyphiidae	<i>Agyneta conigera</i>	x										
Linyphiidae	<i>Agyneta subtilis</i>	x										
Linyphiidae	<i>Araeoncus crassiceps</i>	x										
Linyphiidae	<i>Bathyphantes approximatus</i>	x									x	
Linyphiidae	<i>Bathyphantes gracilis</i>	x			x						x	
Linyphiidae	<i>Bathyphantes nigrinus</i>	x										
Linyphiidae	<i>Bathyphantes parvulus</i>	x										
Linyphiidae	<i>Bolyphantes luteolus</i>	x										
Linyphiidae	<i>Centromerita bicolor</i>	x			x							x
Linyphiidae	<i>Centromerita concinna</i>	x	x									x
Linyphiidae	<i>Centromerus dilutus</i>	x			x							
Linyphiidae	<i>Centromerus sylvaticus</i>	x										
Linyphiidae	<i>Ceratinella brevipes</i>	x		x	x		x					
Linyphiidae	<i>Ceratinella brevis</i>	x										
Linyphiidae	<i>Ceratinella scabrosa</i>	x										
Linyphiidae	<i>Cnephalocotes obscurus</i>	x	x	x	x							x
Linyphiidae	<i>Crustulina guttata</i>	x										
Linyphiidae	<i>Dicymbium brevisetosum</i>	x										
Linyphiidae	<i>Dicymbium nigrum</i>	x										
Linyphiidae	<i>Dicymbium tibiale</i>	x										
Linyphiidae	<i>Diplocephalus cristatus</i>	x										
Linyphiidae	<i>Diplocephalus latifrons</i>	x										
Linyphiidae	<i>Diplocephalus permixtus</i>	x									x	
Linyphiidae	<i>Diplocephalus picinus</i>	x										
Linyphiidae	<i>Diplostyla concolor</i>	x										
Linyphiidae	<i>Dismodicus bifrons</i>	x										
Linyphiidae	<i>Drapetisca socialis</i>	x								x		
Linyphiidae	<i>Entelecara acuminata</i>	x										
Linyphiidae	<i>Entelecara congenera</i>	x										
Linyphiidae	<i>Entelecara erythropus</i>	x										
Linyphiidae	<i>Erigone arctica</i>	x										
Linyphiidae	<i>Erigone atra</i>	x	x	x	x							x
Linyphiidae	<i>Erigone dentipalpis</i>	x			x							x
Linyphiidae	<i>Erigone promiscua</i>	x										
Linyphiidae	<i>Erigonella hiemalis</i>	x										
Linyphiidae	<i>Floronia bucculenta</i>	x										
Linyphiidae	<i>Gnathonarium dentatum</i>	x									x	
Linyphiidae	<i>Gonatum rubens</i>	x										
Linyphiidae	<i>Gongylidiellum vivum</i>	x										
Linyphiidae	<i>Gongylidium rufipes</i>	x										
Linyphiidae	<i>Helophora insignis</i>	x										
Linyphiidae	<i>Hilaria excisa</i>	x										
Linyphiidae	<i>Hylyphantes graminicola</i>	x										
Linyphiidae	<i>Hypomma bituberculatum</i>	x										
Linyphiidae	<i>Hypomma cornutum</i>	x										
Linyphiidae	<i>Kaestneria dorsalis</i>	x										
Linyphiidae	<i>Kaestneria pullata</i>	x										
Linyphiidae	<i>Labulla thoracica</i>	x								x		
Linyphiidae	<i>Lepthyphantes leprosus</i>	x										
Linyphiidae	<i>Lepthyphantes minutus</i>	x								x		
Linyphiidae	<i>Leptorhoptrum robustum</i>	x										
Linyphiidae	<i>Lessertia denticelis</i>	x										
Linyphiidae	<i>Linyphia hortensis</i>	x										
Linyphiidae	<i>Linyphia triangularis</i>	x								x		
Linyphiidae	<i>Lophomma punctatum</i>	x									x	

Table 2. continued.

Family	Species	H & SRS	LVc	LVf	LVm	LVs	Li	Th	Bu	Ha	We	La
Linyphiidae	<i>Macrargus rufus</i>	x										
Linyphiidae	<i>Maso sundevalli</i>	x										
Linyphiidae	<i>Megalephyphantes nebulosus</i>	x										
Linyphiidae	<i>Meioneta beata</i>				x							
Linyphiidae	<i>Meioneta innotabilis</i>	x										
Linyphiidae	<i>Meioneta rurestris</i>	x	x		x							
Linyphiidae	<i>Meioneta saxatilis s.s.</i>	x										
Linyphiidae	<i>Metopobactrus prominulus</i>	x			x							
Linyphiidae	<i>Micrargus herbigradus</i>	x		x	x							
Linyphiidae	<i>Microlinyphia impigra</i>	x										
Linyphiidae	<i>Microlinyphia pusilla</i>	x										
Linyphiidae	<i>Microneta viaria</i>	x								x	x	
Linyphiidae	<i>Milleriana inerrans</i>	x										
Linyphiidae	<i>Minyriolus pusillus</i>			x								
Linyphiidae	<i>Moebelia penicillata</i>	x										
Linyphiidae	<i>Monocephalus castaneipes</i>	x										
Linyphiidae	<i>Monocephalus fuscipes</i>	x										
Linyphiidae	<i>Neriere clathrata</i>	x									x	
Linyphiidae	<i>Neriere montana</i>	x										
Linyphiidae	<i>Neriere peltata</i>	x										
Linyphiidae	<i>Obscuriphantes obscurus</i>	x										
Linyphiidae	<i>Oedothorax apicatus</i>	x										
Linyphiidae	<i>Oedothorax fuscus</i>	x										
Linyphiidae	<i>Oedothorax retusus</i>	x										
Linyphiidae	<i>Ostearius melanopygius</i>	x										
Linyphiidae	<i>Palliduphantes ericaeus</i>	x	x	x	x							x
Linyphiidae	<i>Palliduphantes pallidus</i>	x										
Linyphiidae	<i>Pelecopsis parallela</i>											x
Linyphiidae	<i>Peponocranium ludicrum</i>	x										
Linyphiidae	<i>Pocadicnemis juncea</i>	x										
Linyphiidae	<i>Pocadicnemis pumila</i>	x		x			x					
Linyphiidae	<i>Porrhomma pallidum</i>	x										
Linyphiidae	<i>Porrhomma pygmaeum</i>	x										
Linyphiidae	<i>Saaristoa abnormis</i>	x										
Linyphiidae	<i>Saloca diceros</i>	x										
Linyphiidae	<i>Savignia frontata</i>	x		x								
Linyphiidae	<i>Stemonyphantes lineatus</i>	x										x
Linyphiidae	<i>Tallusia experta</i>										x	
Linyphiidae	<i>Tapinocyba pallens</i>	x										
Linyphiidae	<i>Tapinocyba praecox</i>	x			x							
Linyphiidae	<i>Tenuiphantes alacris</i>	x										
Linyphiidae	<i>Tenuiphantes cristatus</i>	x										
Linyphiidae	<i>Tenuiphantes flavipes</i>	x								x		
Linyphiidae	<i>Tenuiphantes mengei</i>	x	x	x	x		x	x				
Linyphiidae	<i>Tenuiphantes tenuis</i>	x	x	x	x		x					x
Linyphiidae	<i>Tenuiphantes zimmermanni</i>	x									x	
Linyphiidae	<i>Thyreosthenius parasiticus</i>	x										
Linyphiidae	<i>Tiso vagans</i>	x			x							x
Linyphiidae	<i>Walckenaeria acuminata</i>	x										
Linyphiidae	<i>Walckenaeria antica</i>	x	x	x	x							
Linyphiidae	<i>Walckenaeria atrotibialis</i>	x										
Linyphiidae	<i>Walckenaeria clavicornis</i>	x										
Linyphiidae	<i>Walckenaeria cucullata</i>	x										
Linyphiidae	<i>Walckenaeria dysderoides</i>	x										
Linyphiidae	<i>Walckenaeria furcillata</i>	x										
Linyphiidae	<i>Walckenaeria nudipalpis</i>	x										
Linyphiidae	<i>Walckenaeria unicornis</i>	x										

Table 2. continued.

Family	Species	H & SRS	LVc	LVf	LVm	LVs	Li	Th	Bu	Ha	We	La
Liocranidae	<i>Agroeca brunnea</i>	x										
Liocranidae	<i>Agroeca proxima</i>	x	x				x	x				
Lycosidae	<i>Alopecosa barbipes</i>	x										x
Lycosidae	<i>Alopecosa pulverulenta</i>	x										
Lycosidae	<i>Arctosa perita</i>	x										
Lycosidae	<i>Pardosa amentata</i>	x										
Lycosidae	<i>Pardosa monticola</i>	x										
Lycosidae	<i>Pardosa nigriceps</i>	x										
Lycosidae	<i>Pardosa palustris</i>	x										
Lycosidae	<i>Pardosa prativaga</i>	x										
Lycosidae	<i>Pardosa pullata</i>	x										
Lycosidae	<i>Pardosa saltans</i>	x										
Lycosidae	<i>Pirata hygrophilus</i>	x										
Lycosidae	<i>Pirata piraticus</i>	x										
Lycosidae	<i>Trochosa terricola</i>	x	x									
Mimetidae	<i>Ero aphana</i>	x										
Mimetidae	<i>Ero cambridgei</i>	x	x	x			x	x			x	x
Mimetidae	<i>Ero furcata</i>	x	x									
Nesticidae	<i>Nesticus cellulanus</i>	x										
Oonopidae	<i>Oonops domesticus</i>	x										
Oonopidae	<i>Oonops pulcher</i>	x	x							x		
Philodromidae	<i>Philodromus aureolus</i>	x										
Philodromidae	<i>Philodromus cespitum</i>	x										
Philodromidae	<i>Philodromus collinus</i>	x										
Philodromidae	<i>Philodromus dispar</i>	x										
Philodromidae	<i>Philodromus praedatus</i>	x										
Philodromidae	<i>Thanatus formicinus</i>	x	x									
Philodromidae	<i>Thanatus striatus</i>	x	x		x		x	x				x
Philodromidae	<i>Tibellus oblongus</i>	x										
Pholcidae	<i>Pholcus phalangioides</i>	x							x			
Pisauridae	<i>Pisaura mirabilis</i>	x	x				x				x	x
Salticidae	<i>Euophrys frontalis</i>	x										
Salticidae	<i>Evarcha falcata</i>	x										x
Salticidae	<i>Heliophanus flavipes</i>	x										
Salticidae	<i>Marpissa muscosa</i>	x										
Salticidae	<i>Neon reticulatus</i>	x										
Salticidae	<i>Salticus cingulatus</i>	x										
Salticidae	<i>Salticus scenicus</i>	x										
Salticidae	<i>Sitticus pubescens</i>	x										
Segestriidae	<i>Segestria senoculata</i>	x										
Tetragnathidae	<i>Metellina mengei</i>	x								x		
Tetragnathidae	<i>Metellina merianae</i>	x										
Tetragnathidae	<i>Metellina segmentata</i>	x		x						x		
Tetragnathidae	<i>Pachygnatha clercki</i>	x										
Tetragnathidae	<i>Pachygnatha degeeri</i>	x	x									x
Tetragnathidae	<i>Pachygnatha listeri</i>	x										
Tetragnathidae	<i>Tetragnatha extensa</i>	x										
Tetragnathidae	<i>Tetragnatha montana</i>	x										
Tetragnathidae	<i>Tetragnatha nigrita</i>	x										
Tetragnathidae	<i>Tetragnatha obtusa</i>	x										
Tetragnathidae	<i>Tetragnatha pinicola</i>	x										
Tetragnathidae	<i>Tetragnatha striata</i>	x										
Theridiidae	<i>Achaearanea lunata</i>	x										
Theridiidae	<i>Achaearanea simulans</i>	x										
Theridiidae	<i>Achaearanea tepidariorum</i>	x										
Theridiidae	<i>Anelosimus vittatus</i>	x										
Theridiidae	<i>Crustulina guttata</i>	x										

Table 2. continued.												
Family	Species	H & SRS	LVc	LVf	LVM	LVs	Li	Th	Bu	Ha	We	La
Theridiidae	<i>Enoplognatha latimana</i>					x	x					
Theridiidae	<i>Enoplognatha ovata</i>	x										
Theridiidae	<i>Enoplognatha thoracica</i>	x										
Theridiidae	<i>Episinus angulatus</i>	x	x									
Theridiidae	<i>Euryopis flavomaculata</i>	x										
Theridiidae	<i>Neottiura bimaculata</i>	x										
Theridiidae	<i>Paidiscura pallens</i>	x								x		
Theridiidae	<i>Pholcomma gibbum</i>	x										
Theridiidae	<i>Phylloneta impressa</i>	x										
Theridiidae	<i>Phylloneta sisypchia</i>	x										
Theridiidae	<i>Platnickina tincta</i>	x								x		
Theridiidae	<i>Robertus lividus</i>	x										
Theridiidae	<i>Rugathodes instabilis</i>	x										
Theridiidae	<i>Simitidion simile</i>	x										
Theridiidae	<i>Steatoda bipunctata</i>	x										
Theridiidae	<i>Steatoda phalerata</i>	x			x							
Theridiidae	<i>Theridion blackwalli</i>	x										
Theridiidae	<i>Theridion familiare</i>	x										
Theridiidae	<i>Theridion melanurum</i>	x										
Theridiidae	<i>Theridion mystaceum</i>	x										
Theridiidae	<i>Theridion pictum</i>	x										
Theridiidae	<i>Theridion varians</i>	x										
Thomisidae	<i>Diaea dorsata</i>	x								x		
Thomisidae	<i>Ozyptila atomaria</i>	x	x	x	x							
Thomisidae	<i>Ozyptila praticola</i>	x										
Thomisidae	<i>Ozyptila trux</i>	x										
Thomisidae	<i>Xysticus audax</i>	x										
Thomisidae	<i>Xysticus cristatus</i>	x										x
Thomisidae	<i>Xysticus erraticus</i>	x	x		x							x
Thomisidae	<i>Xysticus lanio</i>	x										
Zoridae	<i>Zora spinimana</i>	x	x	x	x	x	x	x				x
<b>Harvestmen</b>												
Leiobunidae	<i>Dicranopalpus ramosus</i>	x										
Leiobunidae	<i>Leiobunum blackwalli</i>	x										
Leiobunidae	<i>Leiobunum rotundum</i>	x										
Nemastomatidae	<i>Nemastoma bimaculatum</i>	x										
Phalangiidae	<i>Mitopus morio</i>	x										
Phalangiidae	<i>Paroligolophus agrestis</i>	x	x							x		
Phalangiidae	<i>Platybunus triangularis</i>	x										
<b>Pseudoscorpions</b>												
Neobisiidae	<i>Neobisium carcinoides</i>	x										
<b>Totals</b>		<b>259</b>	<b>28</b>	<b>17</b>	<b>22</b>	<b>3</b>	<b>11</b>	<b>6</b>	<b>3</b>	<b>20</b>	<b>14</b>	<b>19</b>

H & SRS = Compilation of S.R.S. & Trevor Harris species lists; LVc = Long Valley (ex. carpark); LVf = Long Valley (ex. football pitch); Lvm = Long Valley (mid); LVs = Long Valley (south); Li = The Lings; Th = Thoresby Road Heath; Bu = Office buildings & garden; Ha = Hardwick Wood; We = The Wetlands; La = Lamb House Heath.

sampling locations along The Long Valley (Table 1). This has significantly extended the known range of *T. formicinus* at the Park, but it is still only found within an area approximately 25 x 750 m along a single valley floor (Fig. 13). Within this area *T. formicinus* inhabits heather stands (20–40 cm tall) on a sandy soil covered with the mosses *Dicranum scoparium* and *Pleurozium schreberi*.

Our survey has demonstrated that *Thanatus formicinus* can be found using a G-vac, but that hand searching beneath heather is perhaps even more effective, uncovering specimens which might otherwise be hidden under layers of heather which the vacuum could not reach. We also recorded 78 species of spider and one harvestman during this survey (Table 2). Single adult female voucher

specimens of *T. formicinus* are deposited in the World Museum, Liverpool and Oxford University Museum of Natural History.

#### Acknowledgements

We would like to thank Gareth Jones, Carl Hawke and the National Trust for their generous hospitality and guidance during our survey of Clumber Park. Trevor Harris is also thanked for providing us with a list of spiders previously recorded from the Park, and for details relating to previous finds of *T. formicinus* at Clumber. Lucia Ruffino is thanked for her moss identification. Peter Harvey and Helen Smith provided useful discussion on the conservation of this spider. Peter Harvey also kindly



Figure 10. Hardwick Wood supporting fine old Oak trees. © Richard Gallon.



Figure 11. Lamb House Heath supporting *Alopecosa barbipes* and *Evarcha falcata*, but *T. formicinus* was not found here. © Richard Gallon.

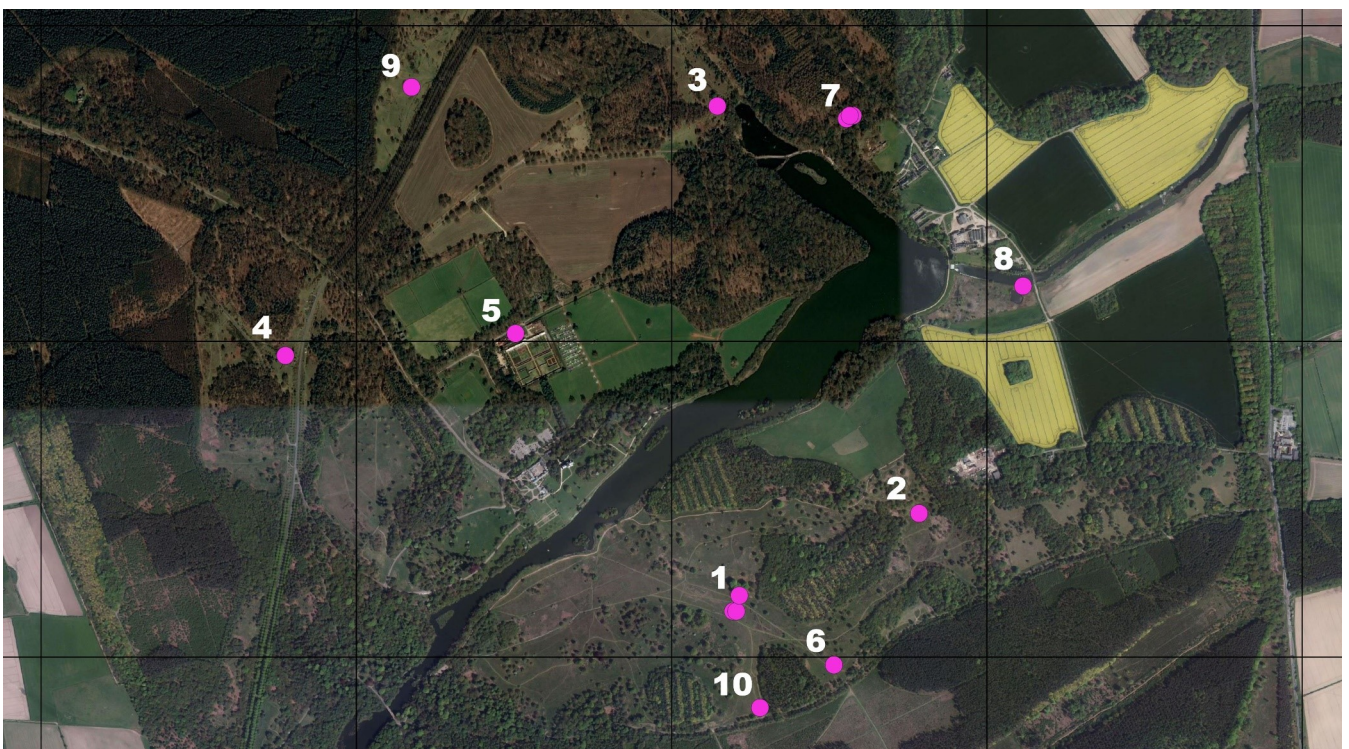


Figure 12. Clumber Park spider survey locations. 1. The Long Valley (ex. car park); 2. The Long Valley (ex. football pitch); 3. The Lings; 4. Thoresby Road Heath; 5. Buildings & Garden; 6. The Long Valley (midway); 7. Hardwick Wood; 8. The Wetlands; 9. Lamb House Heath; 10. The Long Valley (south). Ordnance Survey 1 km grid. Aerial imagery from Bing Maps.

provided us with a Clumber Park species list from the S.R.S. to augment that supplied by Trevor (both lists benefiting from significant recording undertaken by Tom Faulds, Annette Binding and others at the site).

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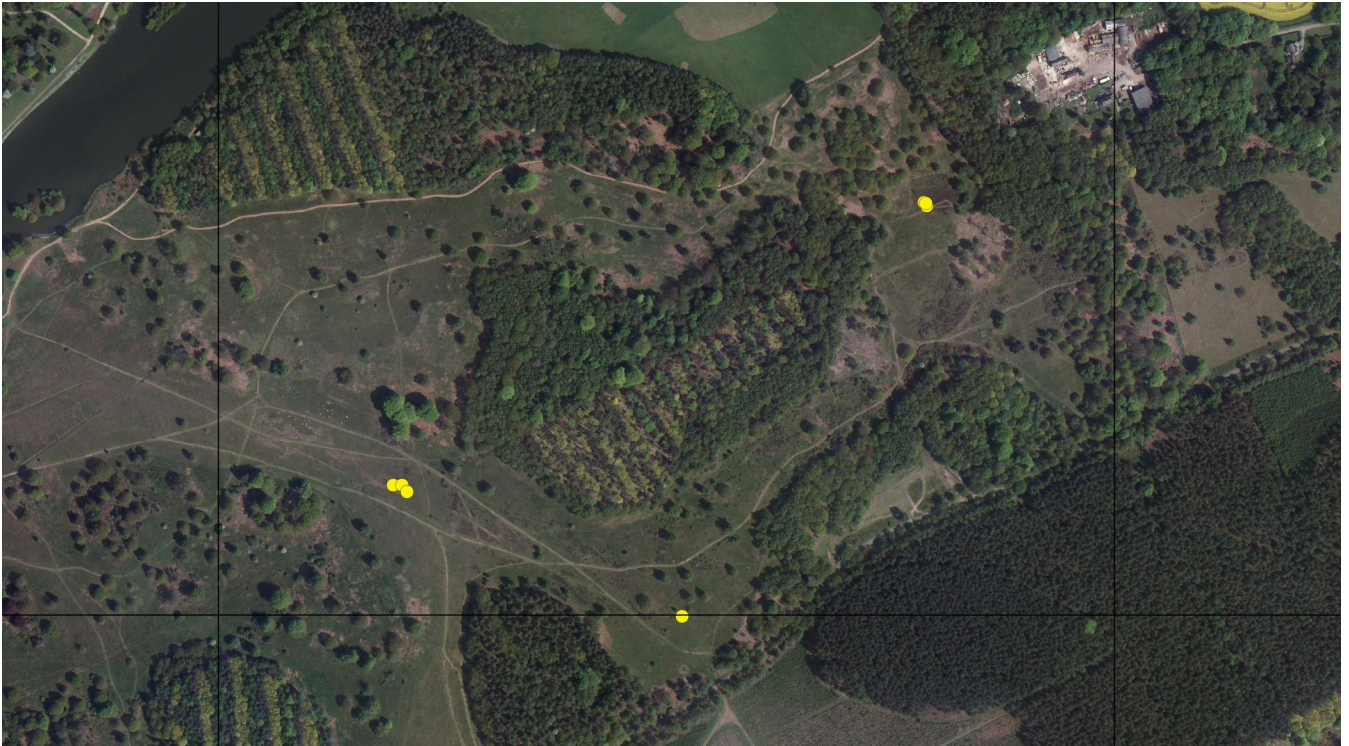


Figure 13. Locations of *Thanatus formicinus* from The Long Valley, Clumber Park recorded during the B.A.S. survey. Ordnance Survey 1 km grid. Aerial imagery from Bing Maps.



Figure 14. Adult female *Thanatus formicinus* from The Long Valley, Clumber Park. It was feared this species was possibly extinct in Britain, until it was discovered at Clumber in 2017. The 2018 B.A.S. survey has helped to define its habitat preference and distribution at the site, which will help inform conservation management for this beautiful spider. © Richard Gallon.

## 2019 B.A.S. FIELD WEEKEND & A.G.M.

### General information

You are warmly invited to attend the B.A.S. field weekend in June 2019. It will be an interesting, stimulating, informative and sociable event, with the following things on offer:

- field trips to stunning local habitats.
- the chance to chat to friendly spider experts and enthusiasts.
- two interesting talks: *John Blackwall – the father of British arachnology in the Conwy Valley & Conservation of the Ladybird spider on the Dorset Heaths.*
- a one-day practical arachnology workshop for less experienced B.A.S. members.
- comfortable accommodation.
- excellent and plentiful food.

If you have anything of interest to show other attendees, then please feel free to bring it along. This might include innovative new equipment for collecting or microscopy, unusual specimens, interesting books, photographs, artwork etc. In fact, pretty much anything at all that is arachnological! There will also be a selection of B.A.S. merchandise for sale.

### Locality & dates

We are excited to announce that we will be staying at **FSC Rhyd-y-creuau**, The Drapers Field Centre, Betws-y-coed, Conwy, North Wales, LL24 0HB. The site is just inside the stunning Snowdonia National Park, and within walking distance of the village of Betws-y-coed. It is also near John Blackwall's house who was arguably the 'father' of British Arachnology.

The weekend event runs from **Saturday 1<sup>st</sup> Monday 3<sup>rd</sup> June**. Please note a change of days to our usual arrangement.

### Weekend layout

This layout might be subject to change, depending on local weather conditions:

- Saturday – arrival time after 3pm, dinner, A.G.M., details about local sites for fieldwork, bar.
- Sunday – breakfast, fieldwork/workshop, dinner, two talks, bar.
- Monday – breakfast, packed lunch to take away, fieldwork, end of weekend.

### One-day workshop

An optional, free one-day workshop for B.A.S. members less experienced in the practical side of arachnology will be held on the Saturday of the A.G.M. weekend. This will include a morning in the field with other B.A.S. members, providing an opportunity to see and try out various capture techniques, and an afternoon session in the laboratory devoted to spider identification, preservation

### ARTICLE SUBMISSION

Please send B.A.S. Newsletter articles to the Editor: **Richard Gallon, 23A Roumania Crescent, Llandudno, North Wales, LL30 1UP, United Kingdom; e-mail: newsletter@britishspiders.org.uk**

Whenever possible, please submit articles by e-mail.



Join the B.A.S. at the A.G.M. weekend to see whether we can rediscover *Maro lepidus* at a site where it hasn't been recorded at since 1973.

© Richard Gallon.

and storage. Advice will be given on equipment such as the best types of microscopes, lighting, etc. to purchase. We will endeavour to tailor the workshop to your individual needs, interests and level of expertise. All equipment required will be supplied, but please feel free to bring your own. If you have any identification books e.g. *Britain's Spiders* by Bee, Oxford & Smith and Roberts' *Collins Field Guide to Spiders of Britain and Northern Europe*, please bring those along too. Please contact Jan Beccaloni (j.beccaloni@nhm.ac.uk) to book, as places are limited.

### Cost & booking arrangements

£155 per person (shared occupancy), £185 (single occupancy). These prices include accommodation, all meals (from the evening meal on Saturday to packed lunch on Monday), use of all Centre facilities (shared with any other groups in the Centre) and sole use of a classroom.

To secure a place, please send your non-refundable £50 deposit to Jan Beccaloni, Curator of Chelicerata (Arachnida, Xiphosura, Pycnogonida), Myriapoda, Tardigrada & Onychophora, Division of Invertebrates, Department of Life Sciences, The Natural History Museum, Cromwell Road, London SW7 5BD (cheques payable to the B.A.S.), stating your dietary preferences (i.e. vegetarian). Balances need to be paid by early April 2019.

### See you in June!

Jan Beccaloni (Meetings Secretary)

### Eric Duffey

It is with great sadness that we have to announce the death of Eric Duffey on the 9th February 2019. A detailed obituary is being prepared for *Arachnology*.

### B.A.S. Newsletter Article Deadlines

Spring: 1st February  
 Summer: 1st June  
 Autumn: 1st October

Please send articles/submissions to the Newsletter Editor by the dates indicated above. However, please note that the Editor reserves the right to hold material back for future issues, but where possible will always try to publish in the next available issue.



# Spider Recording Scheme News

## Spring 2019, No. 93

Editor: Peter Harvey; [grayspeterharvey@gmail.com](mailto:grayspeterharvey@gmail.com)

SRS website: <http://srs.britishspiders.org.uk>

S.R.S. News No. 94 will be published in Summer 2019. Please send contributions by the end of the first week of June at the latest to Peter Harvey, 32 Lodge Lane, GRAYS, Essex, RM16 2YP; e-mail: [grayspeterharvey@gmail.com](mailto:grayspeterharvey@gmail.com).

### Editorial

**Please help future issues by providing articles**, short or longer, on interesting discoveries and observations. **The newsletter depends on your contributions!**

I am enormously grateful to Richard Burkmar for developing the means to replace google maps on the SRS website with Leaflet mapping, which offers a number of mapping options including Bing and MapBox aerial and road maps, Ordnance Survey and Open Streetmap. This includes a Leaflet replacement for the Boundary Digitizer so that logged-on users can continue to draw a polygon for any site of arachnid interest which they have entered on the website.

Many thanks are also due to those Area Organisers and recorders who have continued to send in their records to the recording scheme. An updated summary of the numbers of records in the scheme for different Vice Counties is provided overleaf. If you have a backlog of data to submit, please do send them in. The maps and autecological information available on the website is only as up-to-date as the data provided.

### *Hasarius adansoni* (Salticidae) in North Yorkshire

by Geoff Oxford

In the last SRS News, Tone Killick reported an Adanson's house jumper *Hasarius adansoni*, which was found in Bath, Somerset (Killick, 2018). Another has now turned up in North Yorkshire at Dean's Garden Centre, Stockton on the Forest, near York (SE646552).

Anthony Freeman, who works in the house plant section at the Garden Centre, has an interest in spiders and is on the look-out for interesting specimens. In mid-November he contacted me with the news he had found two 'odd-looking' spiders. One was a mature male *Hasarius* (Figure 1). As Tone pointed out, this species, which is of African origin, is now established worldwide and in temperate regions is found in glasshouses and similar. It is, of course, speculation where this specimen came from but many of the house plants are, of course, imported from The Netherlands, and so that is the most likely source. As Richard Wilson has argued (Wilson, 2011; 2012), cataloguing imported species is important because they could, in the future, become established. *Uloborus plumipes* is an example of a relatively recently imported species brought in on house plants from The Netherlands. It is now well established and widespread in garden centres across Britain (SRS, 2018).

The other specimen from Deans was probably

*Steatoda nobilis* (mature male) but it unfortunately escaped while being photographed!



**Figure 1.** A male *Hasarius adansoni* from North Yorkshire (length 7 mm). Photo credit: Geoff Oxford.

I thank Tone Killick for instantly identifying a photograph of the *Hasarius* specimen.

### References

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Department of Biology, University of York, York YO10 5DD; Email: [geoff.oxford@york.ac.uk](mailto:geoff.oxford@york.ac.uk)

### An update of VC record totals

The table below gives an update on VC totals for each VC, based on numbers of records currently in the recording scheme. Many thanks go to Area Organisers, and especially those who have regularly provided records to the recording scheme. If you have records to send in, please do so so that our distribution maps and autecological data remain up-to-date. Data in any form are gratefully received, but unfortunately these will go into a backlog if in a user- and database-unfriendly format.

VC	Total	2000-on	2010-on	2015-on	VC	Total	2000-on	2010-on	2015-on
1	2921	613	217	136	57	15999	3644	466	128
2	2046	716	261	179	58	11305	1315	1283	987
3	11438	5876	3226	1943	59	15600	4293	2538	1431
4	5007	2646	2462	1172	60	18467	9442	1571	250
5	5382	1495	222	41	61	7727	1066	267	69
6	5167	857	397	228	62	10172	1270	820	157
7	14308	2624	171	97	63	21873	7186	1386	346
8	13317	3044	124	94	64	12579	3899	1573	318
9	22412	10268	4103	1051	65	2773	1251	899	390
10	2545	1878	78	60	66	3312	359	241	28
11	19410	6266	1734	336	67	5572	762	716	241
12	11638	5799	2725	997	68	1300	103	76	6
13	9425	4614	2340	1320	69	12469	5822	557	338
14	11553	7639	3096	1309	70	15498	6926	2437	892
15	24201	14704	4134	1494	71	3980	17	17	15
16	13533	6449	1529	295	72	5712	3464	2403	2392
17	47007	25154	9946	1469	73	10770	2939	2821	2702
18	82199	34168	13261	8454	74	2068	989	912	826
19	55132	6743	2270	1115	75	2245	128	117	106
20	14457	4046	408	98	76	2289	76	54	14
21	14358	4105	1252	486	77	3570	798	671	107
22	7775	4352	887	162	78	1024	169	160	108
23	5041	1026	105	57	79	470	54	43	9
24	4879	826	460	207	80	714	45	44	8
25	23994	8788	2274	581	81	827	37	27	
26	10527	6445	1997	520	82	3344	1112	1074	224
27	19300	6785	1411	322	83	5237	218	106	48
28	13184	8668	7679	6467	84	928	27	4	3
29	8733	3147	1108	27	85	5094	769	552	269
30	30223	8889	1158	41	86	6583	431	123	
31	10379	5984	2406	19	87	2684	1010	283	15
32	9297	1225	92	19	88	6742	1919	1437	9
33	4012	1275	137	65	89	3195	522	282	48
34	4496	926	116	57	90	8155	383	143	7
35	3195	587	105	31	91	2494	1328	507	37
36	4154	940	88	6	92	5661	2504	1390	69
37	11329	5159	645	206	93	3430	1614	436	66
38	7876	1503	218	36	94	1119	337	191	1
39	25771	831	159	94	95	6609	5423	1648	131
40	12380	3798	1969	409	96	17084	12622	3462	157
41	6216	1775	897	293	97	1623	495	86	33
42	2195	463	187	48	98	1777	202	97	7
43	1547	104	25	9	99	2441	44	34	2
44	3591	73	21	8	100	1157	379	279	269
45	10940	2105	111	28	101	918	246	221	
46	12096	2400	544	142	102	2055	667	347	
47	2368	143	23	16	103	716	580	119	115
48	6115	1415	716	286	104	2164	820	288	175
49	14258	4557	2214	1393	105	2256	359	274	1
50	7529	1490	1048	659	106	3017	2121	1124	7
51	5516	514	442	156	107	6282	5437	3236	
52	6660	1357	943	211	108	1739	352	122	18
53	6016	2591	910	363	109	22226	6494	25	2
54	14565	4791	1057	561	110	959	133	101	73
55	39364	12067	229	78	111	2128	1539	260	213
56	12241	6710	1831	317	112	525	24	1	1

## Some new spider records from Berkshire heathland

by Scotty G. Dodd<sup>1</sup> & Jonty Denton<sup>2</sup>

Sampling in Beaufort Park (SU8466) on a mosaic of mature heath and acid grassland areas, yielded a rich spider fauna with *Laseola (Dipoena) tristis* (Hahn) which may be the first for VC22, and other records of note include *Neoscona adianta* (Walckenaer) (first this Century, and first with accurate locality data), *Hypsosinga albobitatta* (Westring) (second ever, first this Century), and *Thyreosthenius biovatus* (O.P.-Cambridge), and *Simitidion simile* (C.L. Koch) both second modern county records.

*Micaria subopaca* Westring is locally frequent on pines on the heaths of Surrey so its appearance in similar conditions in Berkshire was long overdue. Adults were present on sunlit mature scot's pine *Pinus sylvestris* in the company of *Lasius* workers at the Hideout (SU8466) in July-August 2018.

<sup>1</sup> 11 Knowles Meadow, Hill Brow, Hants, GU33 7QW

<sup>2</sup> 31 Thorn Lane, Four Marks, Hampshire, GU34 5BX

## *Donacochara speciosa* (Thorell) (Linyphiidae) in Middlesex

by Jonty Denton

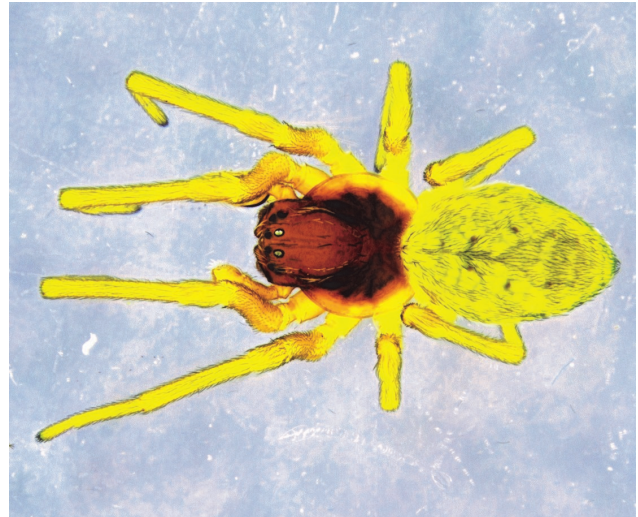
I collected an unfamiliar pallid spider from suspended litter in a reed bed alongside the eastern shore of the Long Water of the Serpentine in Hyde Park (TQ268803) on the 1<sup>st</sup> August 2018. This was a male *D. speciosa* which appears to be the first for Middlesex and Greater London.

31 Thorn Lane, Four Marks, Hampshire, GU34 5BX

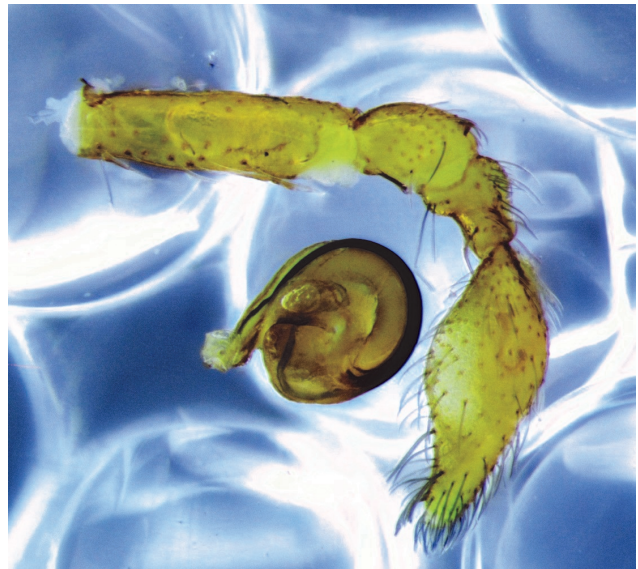
## First record of the dictynid spider *Nigma walckenaeri* (Roewer, 1951) in Yorkshire

by Duncan Allen Fera Science Ltd

On Saturday the 20<sup>th</sup> of October I spotted a small, vivid, green spider on a black motorcycle cover in my garden in Yorkshire (Full Sutton). After collecting and examining the spider, I was fairly certain I had a male specimen of *Nigma walckenaeri* (fig 1). I was a little unsure of the initial identification as to my knowledge it was the first record for this species in Yorkshire and would also be quite a shift north from its more familiar range. The spider did however conform to the descriptions in Roberts (1993) and matched figures from the species page on the Spiders of Europe website (araneae.nmbe.ch, 2018) (Fig 2). To further aid my identification, I posted some photos from my initial examination on Twitter (Fig 3) and directed



**Figure 1.** Dorsal view of Male *Nigma walckenaeri*.  
Photo credit: Duncan Allen



**Figure 2.** Dissected pedipalp of *Nigma walckenaeri*.  
Photo credit: Duncan Allen

photos at the BAS (British Arachnological Society) and Chris Cathrine of Caledonian Conservation Ltd. who were both able to confirm my provisional identification.

*Nigma walckenaeri* usually has a southerly distribution in the UK with most records for this species centring around the Thames valley in Essex, East Berkshire, Middlesex, Surrey (and London) while it has also been collected in the Severn valley in Gloucestershire, Worcestershire and Warwickshire. (srs.britishspiders.org.uk, 2018). The finding of this specimen in Yorkshire is thus far the most northerly record of this spider in the UK and a first for Yorkshire.

### Acknowledgments

I would just like to acknowledge and thank Chris Cathrine of Caledonian conservation Ltd and the BAS for their help with confirming my identification.

### References

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**Figure 3.** Tweet of photos from initial examination. Photo credit: Duncan Allen

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Fera Science Ltd, National Agri-food Innovation Campus, Sand Hutton, YO41 1LZ. [duncan.allen@fera.co.uk](mailto:duncan.allen@fera.co.uk)

## First record of *Nigma puella* (Araneae: Dictynidae) from Scotland, found at Flanders Moss lowland raised bog (VC87 West Perthshire)

by Chris Cathrine

*Nigma puella* (bleeding-heart spider) was recorded for the first time in Scotland in 2018, at Flanders Moss (Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR)) (VC87 West Perthshire). The nearest previous record of this species in the UK is 380 km south east, at Clumber Park in England (VC56 Nottinghamshire) (recorded by A. Binding in 2008).

A single female was collected by Chris Cathrine on 15 July 2018 using bugvac (vacuum sampling) on heather and birch (*Betula* sp.) regeneration at NS649980, while searching for *Heliophanus dampfi* (bog sun-jumper spider) to be filmed as part of Chris Packham's We Want Wildlife UK Bioblitz (with permission from Scottish

Natural Heritage (SNH)). Dictynid webs were noted on the birch regeneration during sampling, although *Dictyna arundinacea* is common throughout Flanders Moss. *N. puella* is a highly distinctive genus and species can be separated reliably by female markings as well as microscopic examination of female epigyne or male palps, but particular care was taken in identification given the atypical habitat (in a UK context) and distance from nearest record. The spider from Flanders Moss was compared closely against diagrams in Roberts (1993), photographs in Bee *et al.* (2017), and a reference specimen collected in Axmouth (VC3 South Devon) provided by Matt Prince for verification, all of which confirmed its identity as *Nigma puella*.

UK literature indicates that *N. puella* builds a cribellate web on the leaves of bushes and trees in gardens, parks and occasionally scrub and woodland (Roberts, 1996; Bee *et al.*, 2017). However, *N. puella* has been recorded on a lowland blanket bog in Kerry, Ireland (Oxbrough *et al.*, 2006; Oxbrough, 2007; Martin *et al.*, 2010). The birch regeneration at Flanders Moss, as well as the edge of the mixed woodland surrounding the bog, appears to offer suitable web-building habitat for this species. It should be noted that the specimen was collected within close proximity to the boardwalk which allows safe public access to a limited area of Flanders Moss reserve, and so it is also possible that it had been transported to the site by visitors. Future recording may help clarify the status of *N. puella* in Scotland.

Flanders Moss is the largest remaining lowland raised bog in Britain and the most intact in Europe (Cloy *et al.* 2005). It is managed by SNH as a flagship site for peatland restoration. Ongoing restoration works aim to rewet the bog, and considerable progress has been made in this regard already. Over time this is likely to reduce the available habitat for *N. puella* on the moss itself as trees and scrub are lost, although the interface between the bog and the birch-dominated semi-natural broadleaved woodland is likely to remain suitable. Flanders Moss supports populations of other notable spider species, including *H. dampfi* (which is a qualifying feature of the SSSI) and *Araneus alsine* (strawberry orb-weaver – for which this bog is the most southerly site known in Scotland) (Cathrine, 2018).

*Nigma puella* is Nationally Scarce but not assessed as qualifying for an IUCN threat category in the latest status review (Harvey *et al.*, 2017).

### Acknowledgements

The author would like to thank David Pickett (Reserve Manager for Flanders Moss, SNH) for the invitation to assist with Chris Packham's We Want Wildlife UK Bioblitz at this site, and permission to collect invertebrate specimens on Flanders Moss SSSI. The author is also grateful to Matt Prince for so generously providing a female *Nigma puella* reference specimen with which to verify the identification of the spider collected at Flanders Moss.

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## *Arctosa perita* on lowland peat in the North West

by Richard Burkmar

In 2009 I visited a lowland bog called Cadishead Moss which had recently been acquired by the Lancashire Wildlife Trust. At around 9.5 hectares, Cadishead Moss (SJ700951) is a small fragment of the once vast Chat Moss in the Irlam area of Greater Manchester, west of Salford. Lowland bogs in this area have been greatly damaged and modified, frequently by conversion to agriculture but also by cutting for peat, often on an industrial scale.

When I visited the bog in May, July and September in 2009. The spider fauna was quite impoverished – I recorded only 17 species over all visits. However, a wolf spider running on bare peat caught my eye. I first assumed it to be *Arctosa leopardus*, but on closer inspection I realised it was an exceptionally dark *Arctosa perita*.

It wasn't so much the colouration of the spider which caught me out – I have seen the variability in *A. perita* colouration ranging from exceptionally light ones on Lancashire's Sefton Coast to darker ones at inland sand

quarries elsewhere in the UK – but rather the peatland habitat. I had never before seen *A. perita* on a peat bog and neither had I heard of them being found in this habitat.



**Figure 1.** *Arctosa perita* on dry, oxidising peat at Cadishead Moss in 2009.  
Photograph © Richard Burkmar

The bog at Cadishead was degraded. Cutting for peat over most of the site had ceased some years earlier and scrub was invading the dry bog. There were also areas of bare dry peat which was where I found *A. perita*. The spiders were making their burrows directly in this dry, friable oxidising peat. This I think was the key to their presence – I doubt that they would survive in healthier, wet peat.

Almost ten years later, in 2018, I visited the site again. Thanks to rewetting work and scrub control by the Lancashire Wildlife Trust, the condition of the bog had increased markedly and in a couple of short visits I added 28 species to the site list including *Robertus arundineti* – a first for VC59 – and the Nationally Scarce *Euryopis flavomaculata*. However, of *A. perita* there was no trace.

In the intervening years the Lancashire Wildlife Trust also purchased an adjoining area of peat called Little Woolden Moss. This much larger 100 hectare site was, until recently, a bare moonscape of industrially milled peat. A few metres depth of peat remain on the site and the Lancashire Wildlife Trust have taken on the exciting, if somewhat daunting, task of rewetting and restoring it. Initial results have been remarkable with planted and naturally invading Cotton Grass (*Eriophorum* sp) covering large areas within a few years. Significant numbers of wading birds are already breeding there and in a couple of short visits I recorded 18 species of spiders in large numbers (no doubt providing food for many wader chicks). With large areas of dry oxidising peat currently remaining, it was no great surprise to me that *A. perita* occurs in large numbers.

*Arctosa perita* at peatland sites can probably be regarded as an indicator of *degraded* habitat since it is likely the friable, dry peat that is probably responsible for their presence. As the peat is rewetted the spider is likely to find it less to its liking and gradually disappear. So whilst this is an interesting example of post-industrial adaptation by a species (perhaps with parallels to that of the Peppered Moth, *Biston betularia*) we should not

worry about trying to preserve this species on our peatland sites and could, arguably, regard its future disappearance as a milestone in the restoration of the bog!



**Figure 2.** An area of dry, oxidising peat where *Arctosa perita* was found at Cadishead Moss in 2009. Photograph © Richard Burkmar



**Figure 3.** A comparison of the colour of *Arctosa perita* from specimens taken at the Sefton Coast (left) and Cadishead Moss (right) in 2009. Photograph © Richard Burkmar

## *Cryptachaea blattea* (Urquhart, 1886) recorded for the first time in North Wales

by Richard C. Gallon

The theridiid *Cryptachaea blattea* (Urquhart, 1886) was first reported from Britain in 2011 when Doug Marriott swept a female specimen from a garden on the Isle of Wight (Marriott, 2012). Subsequent British records have come from South Devon (2014 & 2017; Matt Prince SRS), Middlesex (2015; Thomas, 2015), East Gloucestershire (2016; Killick, 2016), East Cornwall (2017; Tylan Berry SRS), Pembrokeshire (2017; Tylan Berry SRS) and South Lancashire (2018; Steve McWilliam SRS). I have also been told that Chris Felton has found this species in Liverpool recently (T. Hunter, Pers. Comm.).

I recall Doug Marriott showing me his original specimen at the 2013 B.A.S. A.G.M. Weekend and thinking that it was one of those species I was unlikely to encounter. However, last year when Rich Burkmar and Tony Hunter mentioned that *C. blattea* had turned up in South Lancashire I promised to keep an eye out for it.



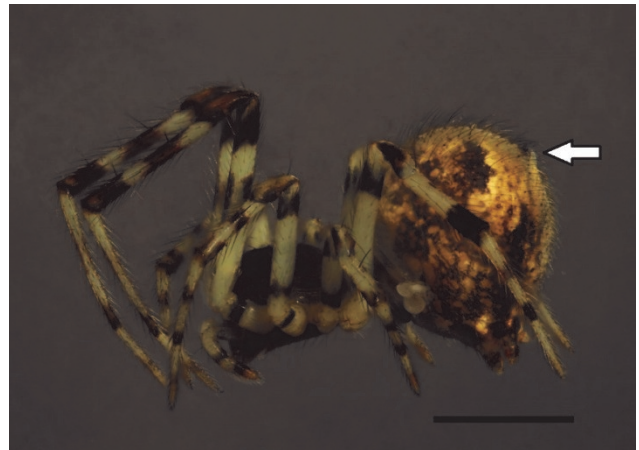
**Figure 1.** Adult female *Cryptachaea blattea* (Urquhart, 1886) from Llandudno, dorsal view. Scale 1 mm. Photograph © Richard Gallon.



**Figure 2.** Adult female *Cryptachaea blattea* (Urquhart, 1886) from Llandudno, ventral view. Scale 1 mm. Photograph © Richard Gallon.

On the 6th January 2019 I spotted a small, strange looking dark female theridiid clinging to the downstairs toilet wall, just below the hand basin. Its high abdominal profile suggested it was something different to the usual

*Theridion* species which enter my home. The specimen was collected, and a microscopic examination revealed the distinctive single abdominal tubercle typical of *C. blattea* (Figs. 1–4).



**Figure 3.** Adult female *Cryptachaea blattea* (Urquhart, 1886) from Llandudno, lateral view showing the single abdominal tubercle (arrowed). Scale 1 mm. Photograph © Richard Gallon.



**Figure 4.** Adult female *Cryptachaea blattea* (Urquhart, 1886) from Llandudno, posterior view showing the single central abdominal tubercle. Scale 1 mm. Photograph © Richard Gallon.

This Llandudno record (SH79718143) represents the second Welsh record for *C. blattea* and the first record for Caernarvonshire (Vice county 49) and North Wales.

### References

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## Harvestman Recording Scheme Newsletter

Spring 2019 Editor: Mike Davidson

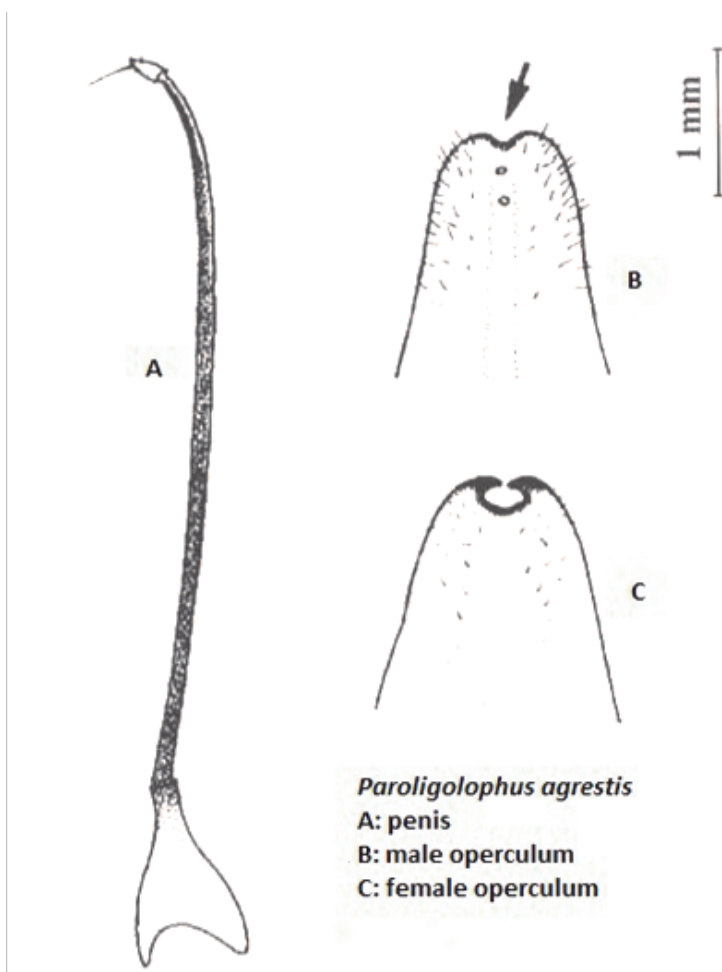
The Harvestman Recording Scheme is steadily accumulating new records and we are grateful to everyone who has tidied up their backlog and sent theirs in. Due to a technical glitch I'm not able to give a precise total but we have currently in excess of 47,600 records. So let's all have a big push to get up to our next target of 50,000 records by 2021!

In this issue Richard Burkmar tells us about FSC's impressive online harvestman ID resource. In the next issue we hope to start a new series of Harvestman Crib Sheets. This series is intended to bring together new or dispersed information to aid in harvestman identification. The sheets will be published periodically in the BAS Newsletter and also made available in pdf format on the Spider & Harvestman Recording Schemes website. Feedback is encouraged and the sheets will be updated as necessary. We will start with Oligolophine species in the genera *Paroligolophus*, *Oligolophus* and *Lacinius* and I would welcome your suggestions of useful ID characters and tips. Are there any species we can confidently identify in larval stages?

**Harvestman DNA Barcoding Project:** During 2019 we hope to run a project to barcode all British species, with a good geographic spread of specimens. We would very much like to hear from anyone who would be interested in helping with the collection of specimens or has specimens of the rarer species from which we could harvest DNA, if necessary. More information will be available on the website in due course, but for now please let us know if you are interested in participating.

### How The Harvestman got its Notch

It is interesting that *Paroligolophus agrestis* is most easily identified in its adult female form. This is due to the distinctive notch on the end of its genital operculum - the hatch which, in most species, opens to allow the entry of the male's penis and exit of the female's ovipositor when egg laying. The male's notch is but a minor dent in comparison and often difficult to see (figs A-C).



But why does it have a notch and why do almost none of the standard texts mention its function? I suppose it's a bit like the shape of the continents - anyone who had looked at their shape on a globe or atlas could see the shapes fitted together. However it took a long time for the reason to be spoken of in polite circles and plate tectonics to be accepted.

Sometime in the 1990s, having satisfied myself that the measurements worked, I juxtaposed the relevant organs on a microscope slide and took a photo to demonstrate that the male's remarkably slim but heavily chitinised penis did indeed fit through the notch in the female's operculum. It seemed obvious that this was how it worked, but I failed to obtain a satisfactory photograph of this happening in life. More recently, photographs of mating *P. agrestis*, taken by Jürgen Peters, were used by Hay Wijnhoven (2008) to support the idea that the female operculum remained closed during mating and that access was via the notch.

Based on this series of lateral photos, Wijnhoven discusses the likely mating process. No other Oligolophine species would be able to pick this reproductive lock so the female is left to select which males of its own species to mate with and which sperm to select for fertilising her eggs. Wijnhoven suggests that the male is potentially able to by-pass the seminal receptacles but no doubt the female has the last

word. Presumably the modification of the operculum evolved from a simple notch in each sex helping to guide the male's organ into the correct position. The evolution of the female's notch, perhaps, is replayed in its gradual development in successive larval instars and final moult to the adult phase. However more

observations of mating in this and other species are needed as well as that definitive photo of *P. agrestis* mating to confirm the theory. Did the operculum move, dear, or was it just the continental plate slipping?

### Reference

Wijnhoven, H., 2008. Some Notes On The Mating Behaviour Of The Harvestman *Paroligolophus agrestis* (Opiliones, Phalangidae). *Nieuwsbrief* SPINED 24.

**Call for articles** I look forward to receiving more material for future issues.

**Mike Davidson** hrs@britishspiders.org.uk

## Online interactive ID resources for Harvestmen of Britain and Ireland

by Richard Burkmar

The website 'Harvestmen of Britain and Ireland', <https://harvestmen.fscbiodiversity.uk/>, is an online identification resource created with the FSC Identikit (<https://www.fscbiodiversity.uk/identikit>). It features a number of different ID resources including multi-access keys, a side-by-side comparison tool and species accounts which concentrate on field identification.

Multi-access keys are so called because they allow the user to enter values for character states, e.g. presence or absence of a trident, body length etc, in any order they like; in other words they can be accessed at multiple points. This contrasts to a traditional dichotomous key, such as those in Hillyard and Sankey (1989) and Wijnhoven (2009), which dictate the order in which characters must be examined and generally have a single point of entry – couplet one! Multi-access keys allow the user to consider as many or as few characters as they like, but being less prescriptive than dichotomous keys, the output must be considered especially critically. Using a multi-access key effectively takes at least as much practice as using a dichotomous key.

Multi-access keys needn't be delivered via computers. For example the table of characters on the reverse side of the FSC foldout chart for Harvestmen (Richards, 2010) is effectively a multi-access key. Sometimes when laid out in a tabular format like this they are known as 'lateral keys'. The advantage of delivering them as computer-based resources are manifold, including the ability to incorporate more characters, illustrations, species accounts etc. Interactive computer-based resources also offer the opportunity to provide engaging interfaces and can potentially be carried into the field on mobile devices like smartphones.

**FSC Identikit** Species Comparisons Keys ▾ Info & help ▾ Links ▾

# Harvestmen of Britain and Ireland

An interactive guide from the Field Studies Council

This two-column visualisation of the multi-access key displays taxa in two columns. Those on the left contain the most likely matches to the character values you specify. Those on the right are less likely matches. Its a nice simple visualisation of the multi-access key.

	Head projections / trident	Evidence balance positive	Evidence balance negative
All	conspicuous trident ✕	<i>Oligolophus tridens</i> 0.8	<i>Nemastoma bimaculatum</i> -0.8
Sex	inconspicuous trident ✕	<i>Oligolophus hansenii</i> 0.8	<i>Mitostoma chrysomelas</i> -0.8
Ecology	Trident orientation	<i>Paroligolophus agrestis</i> 0.8	<i>Nemastomella bacilifera</i> -0.8
Body	select option	<i>Paroligolophus meadii</i> 0.8	<i>Trogulus tricarinatus</i> -0.8
Trident	Trident member length	<i>Lacinius ephippiatus</i> 0.8	<i>Anelasmacephalus cambridgei</i> -0.8
Ocularium	select option	<i>Odiellus spinosus</i> 0.8	<i>Sabacon viscayanum ramblaianum</i> -0.8
Palps	Additional tubercles around trident	<i>Lophopilio palpalis</i> 0.8	<i>Homalenotus quadridentatus</i> -0.8
Chelicerae	select option(s)		<i>Mitopus morio var morio</i> -0.8
Legs	Other distinctive trident features		
	select option(s)		

Screenshot from the two-column multi-access key on a laptop



Screenshots of a species account from the mobile-first multi-access key on a smartphone

Harvestmen of Britain and Ireland provides four multi-access keys which are actually different interfaces on the same back-end knowledge-base. Three of them are designed to be viewed on large format devices such as laptops and one is designed to be delivered on small format devices such as smartphones. The 'mobile-first' smartphone key also uses some technology (called Progressive Web Apps) which allows it to be used offline after downloading whilst in range of wifi. These online ID resources are not a replacement for existing paper-based resources, but rather they complement them. They are a great way of exploring harvestmen morphology without necessarily trying to identify one. For example, to quickly see which harvestmen have tridents, simply enter the character's state 'conspicuous trident' and/or 'inconspicuous trident' for the character 'head projections/trident' and watch the taxa react to your input.

Harvestmen of Britain and Ireland benefits hugely from the inclusion of a large library of harvestmen images provided by Paul Richards and using the tool is a great way of exploring and comparing these pictures.

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