Figure 2. *Pholcus phalangioides* attempting to bite *Cornu aspersum*. © Vicky Gilson.

spider was back in a web next to the door on Pellitory-of-the-wall (*Parietaria officinalis*), about 60 cm from the original observation site, no doubt with a somewhat gummy mouth.

I am intrigued whether this was a predation attempt or perhaps a defensive act, although I did not observe an egg -sac or webs close to where the encounter happened. From my research in the B.A.S. library on the diet of *Pholcus phalangioides*, I have yet to encounter reports of molluscs being predated by this species. Given the snail's large size and unappetising mucus layer it seems unlikely to be a prey item. A note on large *Pholcus* prey items was written by Nigel Webb (1979). He described a 45 mm pet stick insect *Carausius morosus* being predated by this spider. The snail I observed had a shell width of about 20 mm.

I wonder whether other members are aware of any publications on snail interactions with cellar spiders, have observed similar encounters, or might be tempted to do some similar late-night spider behaviour surveys around the home.

I would like to thank Mags Cousins for the identification of the snail and suggestion of submitting this article to Mollusc World also.

Reference

Webb, N. 1979. An unusual capture by *Pholcus*. *Newsl. Br. arachnol. Soc*. **26**: 13.

E-mail: vfgilson@hotmail.co.uk

Lockdown Sucks. An Enforced Survey of Garden Lawns

by Richard Wilson*, Tylan Berry, Alan Cann, Chris Cathrine, Francis Farr-Cox, Richard Gallon, James McGill & Jim Pewtress

Introduction

In late December 2019, and in to January 2020, the world gradually became aware of a novel coronavirus emerging from Hubei Province, China. In a matter of weeks became a pandemic, resulting in nationwide restrictions on movement, universally referred to as 'lockdowns'. The arrival of what is now known as Covid-19 in Britain resulted in the Prime Minister (Boris Johnson) eventually announcing in a televised address on the 23rd March 2020 that a UK-wide restriction on all but essential activities would commence, enforced by Regulations made under the Public Health (Control of Disease) Act 1984 in England and Wales. More strict restrictions were imposed in Scotland by the First Minister (Nicola Sturgeon) under the Public Health etc. (Scotland) Act 2008, where only essential ecology fieldwork such as relating to hospitals or maintaining existing infrastructure was permitted until late May 2020. Thus, from late March for a period of up to two months, all but essential travel ceased, including the pursuit of leisure activities such as natural history, unless it could be justifiably combined with the permitted daily exercise. However, this exercise was generally understood to exclude natural history pursuits other than incidental recording whilst partaking in the suggested hour perambulation from home. For amateur naturalists such as entomologists and arachnologists, this realistically meant a cessation of all focussed recording activities (e.g. sweep-netting or vacuum sampling), which also included formal monitoring activities such as the butterfly monitoring scheme administered by Butterfly Conservation. Other ecological disciplines such as ornithology were affected; breeding bird surveys overseen by the British Trust for Ornithology were also paused (though these commenced later in May 2020). Professional ecology survey work, including within the planning sector, was initially severely curtailed in England and Wales until clarification from the Department for the Environment, Food and Rural Affairs (DEFRA) was received by the Chartered Institute for Ecology and Environmental Management (CIEEM), the professional body representing ecologists and environmental specialists, in early April 2020.

With this period of uncertainty, the lead author (RW) was discussing events and implications for CIEEM members with a Scottish colleague, fellow arachnologist and B.A.S. member (Chris Cathrine, Caledonian Conservation) and the then possibility of having no ability to undertake any ecology surveys (personal or paid) during the 2020 survey season. Concurrently, via social media (particularly Twitter), it was becoming apparent that the community of naturalists who use this platform were beginning to focus on studying the fauna and flora within their gardens or immediate neighbourhood greenspace – and hence the idea of a co-ordinated study of our gardens' spider fauna was born.

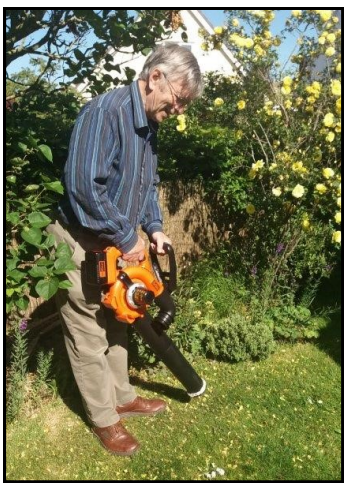

Figure 1. Francis Farr-Cox vacuum sampling spiders from his garden lawn.

Methodology

The methodology agreed to was to vacuum sample a lawn and immediate adjacent flower border (if present) for a timed 120 seconds once a week on a Friday, Saturday or Sunday at the convenience of the surveyor; i.e. at any time during the day. If the first week's sample was collected on a Friday, the second week could be collected on a Saturday or Sunday, if it was inconvenient to do so on the Friday. Material would then be sorted (sieved over a white tray

Table 1. Gardens surveyed during the Covid-19 Pandemic in Britain (March to May 2020).

Garden	National Grid Reference	Vice County	Species Richness	No. of Samples
St Austell, Cornwall	SX013518	2: East Cornwall	24	9
Taunton, Somerset	ST215261	5: South Somerset	18	6
Burnham-on-Sea, Somerset	ST311493	6: North Somerset	19	6
Llandudno, Conwy	SH797814	49: Caernarvonshire	19	6
Leicester, Leicestershire	SK599009	55: Leicestershire	22	4
Kirbymoorside, North Yorkshire	SE698864	62: North-east Yorkshire	13	3
Leeds, West Yorkshire	SE307398	64: Mid-west Yorkshire	28	8
Alloa, Clackmannanshire	NS894932	87: West Perthshire	44	8

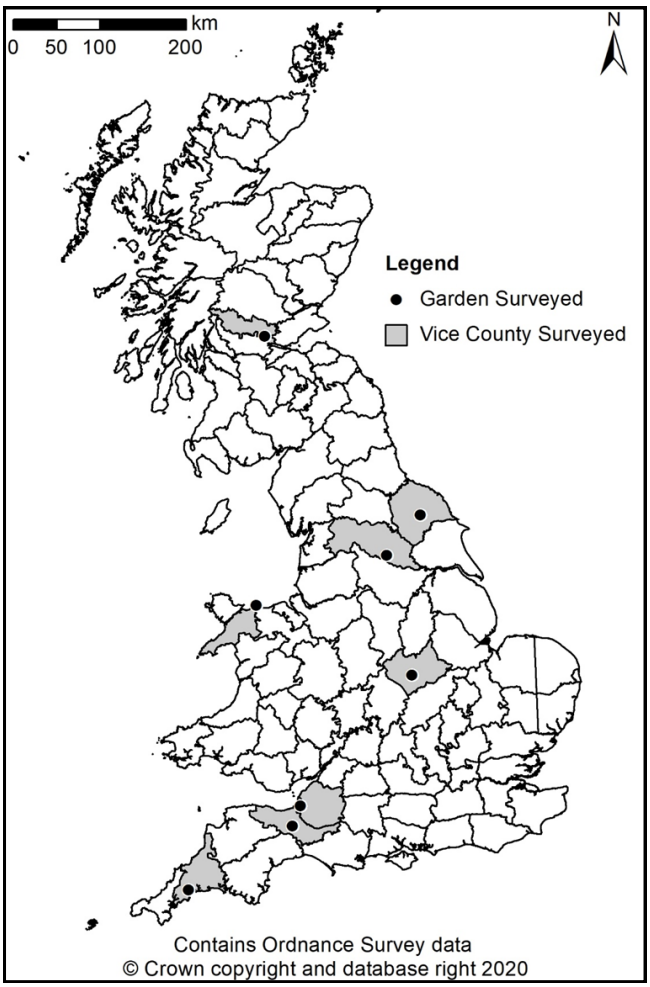

Figure 2. Locations of gardens surveyed during the Covid-19 pandemic in Britain (March to May 2020).

for example) and the spiders (and any other invertebrates the surveyor wished) were identified, individuals counted and separated into male, female or sub-adult. Readers can gain a visual appreciation of this study by viewing a video on YouTube (Cathrine, 2020).

No other metric was recorded such as lawn area, total garden area, botanical species-composition of lawns, how regular (if at all) the lawn was mowed or connectivity with semi-natural habitats. This would be appropriate in a more formal study (see Discussion) but would potentially have put individuals off participating. Whilst the initial idea was to survey garden lawns, which are widely understood to be a managed area of grass-dominated habitat, participants collected from vegetation immediately adjacent to the lawn *sensu stricto*, such as the flowerbed; so whilst in conversational parlance, this study is described as a garden lawn survey, strictly speaking, it incorporated ground and low field vegetation within immediately adjacent flower borders. Reference to 'lawn' in this article should therefore be taken to include this ancillary habitat.

RW promoted the survey via his Twitter handle (@ecology_digest), as did the B.A.S. (@britishspiders) and various participants. There was no defined duration of the project at its inception, as it was unknown how long the restrictions on movement would last. In the event, the weekly survey extended until mid-May, by which time, restrictions were being eased and RW's professional work increased.

Objectives

The objective of this exercise was initially to provide those who wished to do so, a focussed activity and an opportunity to study the spiders in their garden once a week knowing that others were undertaking a similar exercise. Observations were communicated between participants, generally using Twitter with the hashtags #gardenspiders and #LockdownSucksChallenge. Emphasis was on the enjoyment element, with social media allowing illustrated snippets to be communicated. Focussed attention also offered the distinct possibility of recording something unexpected in the garden with the added benefit of generating records in spring 2020 for the national recording scheme. Once the exercise commenced, RW considered that it might be possible to compare gardens, or if battery-powered and petrol-driven vacuum samplers generated different results. However, in the event, sample size was too small for any meaningful comparisons.

Results

Eight gardens were sampled; six in England, one in Wales and one in Scotland (see Table 1 and Figs. 2–8). Samples were collected over a nine-week period from the weekend of the 20th –22nd March 2020 (Week 1) until the weekend of the 15th–17th May 2020 (Week 9). However, only one garden was sampled in Week 1 (Leeds, West Yorkshire); and only one had their garden sampled in every week (St Austell, Cornwall) (sample range 3–9; median 6). Species-richness ranged from 13 to 44 (median 20.5).

A total of 85 species of spider in 15 families was recorded in all gardens (see Table 2 for list) throughout the nine week period the study eventually covered; and one subspecies (*Dicymbium nigrum* ssp. *brevisetosum*).

Figures 3–8. Vacuum sampled garden lawns. 3. St Austell; 4. Burnham-on-Sea; 5. Llandudno; 6. Leicester; 7. Kirbymoorside; 8. Alloa.

Unsurprisingly, money-spiders (Linyphiidae) were the dominant family with 55 species recorded, but a range of ground-dwelling spiders including seven species of comb-footed spider (Theridiidae), four species of long-jawed orbweb spider (Tetragnathidae) and four species of wolf-spider (Lycosidae) were recorded within garden lawns.

Species-richness gradually increased as the season progressed from March (Week 1; 7 species) through to the end of April 2020 (Week 6; 42 species). Species-richness remained consistent during the first two May weekends (43 and 42 species) until Week 9 (mid-May) when only 27 species were recorded (see Fig. 9). As a consequence of the restrictions being lifted, weekly surveys were discontinued as work or other opportunities took individuals' attention elsewhere.

A total of 18 species was recorded on at least six occasions; and 21 species on more than half the weeks in the study. Of these 21 species, 81% were money-spiders. The eight species most frequently encountered in this study (in eight or nine weeks) were *Bathyphantes gracilis*,

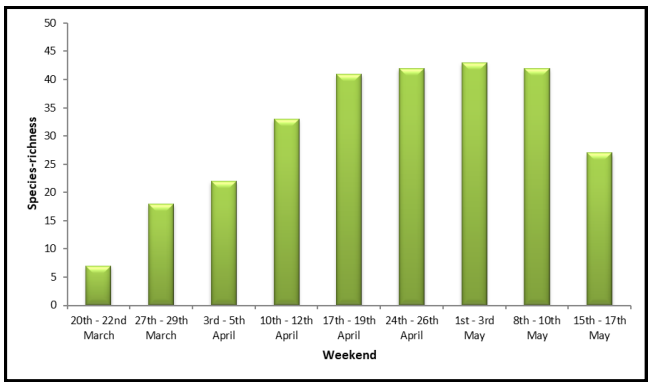

Figure 9. Species-richness across all gardens in study during Spring 2020.

Diplocephalus latifrons, *Erigone dentipalpis*, *Erigonella hiemalis*, *Tenuiphantes flavipes*, *Tenuiphantes tenuis*, *Neriene clathrata* and *Pachygnatha degeeri*. These can be

Table 2. Spider species list (all sites in study).

Family	Species	20–22 March	27–29 March	3–5 April	10–12 April	17–19 April	24–26 April	1–3 May	8–10 May	15–17 May	Frequency
Oonopidae	*Oonops pulcher*									1	1
Mimetidae	*Ero cambridgei*						1		1		2
Mimetidae	*Ero furcata*								2		1
Theridiidae	*Episinus angulatus*								1		1
Theridiidae	*Cryptachaea blattea*	1		1	2	1	2	1			6
Theridiidae	*Theridion mystaceum*								1	1	2
Theridiidae	*Neottiura bimaculata*			1						1	2
Theridiidae	*Paidiscura pallens*						1	2			2
Theridiidae	*Enoplognatha ovata sens. str.*						2	1			2
Theridiidae	*Pholcomma gibbum*			1							1
Linyphiidae	*Ceratinella brevipes*					1	1		2		3
Linyphiidae	*Walckenaeria acuminata*		1		1	1					3
Linyphiidae	*Dicymbium nigrum*		3	1	4	3	1	2	1		7
Linyphiidae	*Dicymbium nigrum brevisetosum*				2		1		1		3
Linyphiidae	*Entelecara acuminata*					1					1
Linyphiidae	*Entelecara erythropus*		1					1	1		3
Linyphiidae	*Hylyphantes graminicola*					1					1
Linyphiidae	*Gongylidium rufipes*			1	1	1	3	3	1	1	7
Linyphiidae	*Dismodicus bifrons*						2	1	4		3
Linyphiidae	*Hypomma bituberculatum*						1		1		2
Linyphiidae	*Maso sundevalli*					1			1		2
Linyphiidae	*Pocadicnemis pumila sens. str.*							1	1		2
Linyphiidae	*Pocadicnemis juncea*						1	2			2
Linyphiidae	*Oedothorax fuscus*			1	1	1			1	1	5
Linyphiidae	*Pelecopsis parallela*		1		2	1		1			4
Linyphiidae	*Parapelecopsis nemoralis*							1			1
Linyphiidae	*Cnephalocotes obscurus*					1					1
Linyphiidae	*Tiso vagans*			1	3	2	2	2	2		6
Linyphiidae	*Troxochrus scabriculus*				1						1
Linyphiidae	*Monocephalus fuscipes*			2	1	2	4	2		1	6
Linyphiidae	*Micrargus herbigradus sens. str.*				2			1			2
Linyphiidae	*Micrargus apertus*									1	1
Linyphiidae	*Micrargus subaequalis*								1		1
Linyphiidae	*Erigonella hiemalis*	1	2	2	6	1	3	1	1		8
Linyphiidae	*Savignia frontata*				1		1				2
Linyphiidae	*Diplocephalus cristatus*			1	2	2			1		4
Linyphiidae	*Diplocephalus latifrons*		4	1	5	2	4	4	1	1	8
Linyphiidae	*Araeoncus humilis*						1				1
Linyphiidae	*Collinsia inerrans*					1					1
Linyphiidae	*Erigone dentipalpis*	1	2	3	2	5	2	3	4	2	9
Linyphiidae	*Erigone atra*			2	3		4	2	2	1	6
Linyphiidae	*Mermessus trilobatus*						2				1
Linyphiidae	*Porrhomma pygmaeum*						1				1
Linyphiidae	*Porrhomma pallidum*							1			1
Linyphiidae	*Porrhomma errans*					1					1
Linyphiidae	*Agyneta rurestris*					1	1				2
Linyphiidae	*Agyneta affinis*									1	1
Linyphiidae	*Microneta viaria*		1					1			2
Linyphiidae	*Centromerita bicolor*					1	1				2
Linyphiidae	*Bathyphantes gracilis*	1	5	5	8	7	8	7	4	4	9
Linyphiidae	*Bathyphantes nigrinus*							2	2		2
Linyphiidae	*Diplostyla concolor*		1	3	1	1	2	1	1		7
Linyphiidae	*Poeciloneta variegata*					1					1
Linyphiidae	*Stemonyphantes lineatus*							1			1
Linyphiidae	*Megalepthyphantes* sp. near *collinus*									1	1
Linyphiidae	*Tenuiphantes tenuis*	2	4	4	13	7	8	8	5	5	9
Linyphiidae	*Tenuiphantes zimmermanni*			2	4	2	1	2		1	6
Linyphiidae	*Tenuiphantes cristatus*				2	1			1	1	4
Linyphiidae	*Tenuiphantes flavipes*		1	3	3	1	4	4	2	2	8
Linyphiidae	*Palliduphantes ericaeus*						1		1		2
Linyphiidae	*Linyphia hortensis*				1	1	3	1	2	3	6
Linyphiidae	*Neriene montana*			1		1		1			3
Linyphiidae	*Neriene clathrata*	2	2	3	5	5	4	4	2	1	9
Linyphiidae	*Neriene peltata*				2	1	1		1		4
Linyphiidae	*Microlinyphia pusilla*				1	3	2	1		1	5
Tetragnathidae	*Tetragnatha extensa*						1	2			2
Tetragnathidae	*Pachygnatha clercki*								1		1
Tetragnathidae	*Pachygnatha degeeri*	2	4	3	5	3	3	4	4	1	9
Tetragnathidae	*Metellina mengei*				1	1			2	2	4
Lycosidae	*Pardosa pullata*						1	1	1	1	4
Lycosidae	*Pardosa amentata*			2	3	4	2	2	4	1	7
Lycosidae	*Pardosa hortensis*						1		1		2
Lycosidae	*Alopecosa pulverulenta*							1			1
Pisauridae	*Pisaura mirabilis*		1		1	2	1				4
Hahniidae	*Hahnia nava*							1			1
Amaurobiidae	*Amaurobius similis*					1					1
Phrurolithidae	*Phrurolithus festivus*						2	1	1	1	4
Clubionidae	*Clubiona terrestris*		2		2	2	1	1			5
Clubionidae	*Clubiona lutescens*							1	1	2	3
Clubionidae	*Clubiona comta*		1			1					2
Clubionidae	*Clubiona diversa*						1				1
Gnaphosidae	*Micaria micans*							1			1

Table 2. Continued.

Family	Species	20–22 March	27–29 March	3–5 April	10–12 April	17–19 April	24–26 April	1–3 May	8–10 May	15–17 May	Frequency
Philodromidae	*Philodromus dispar*								1	1	2
Thomisidae	*Xysticus cristatus*		1						3		2
Thomisidae	*Ozyptila praticola*				1	1		1	1		4
Salticidae	*Heliophanus cupreus*							1			1
Species-richness	**85**	**7**	**18**	**22**	**32**	**41**	**41**	**43**	**41**	**27**	
Numbers		**10**	**37**	**44**	**90**	**77**	**88**	**82**	**71**	**40**	

Figure 10. *Erigonella hiemalis* females. © Alan Cann.

considered to be the most frequently encountered sexually mature spiders of garden lawns and borders in Britain during spring. All except *P. degeeri* (Tetragnathidae) are money-spiders. Approximately a third (28 species) were recorded just the once, but this is likely to be a consequence of the cessation of surveying after nine weeks.

No species with a nature conservation status were recorded but a new species for Watsonian Yorkshire, the synanthropic *Cryptachaea blattea* (Theridiidae), was collected on three occasions between late March and late April 2020.

Discussion

This survey only provides a snapshot of spring spider species-richness within garden lawns. However, over 80 species recorded (about 13% of the British list) in a limited period suggests that spider species-richness within British gardens is not insubstantial; and hopefully offers B.A.S. members food for thought as to what can be recorded within their home environs.

The sample size (number of gardens) is small and not evenly distributed across Britain; there being no representation from south-east England or East Anglia, for example. Further, the study did not collect data on whether lawns were mown or unmown during this period; their, or adjacent flower borders, botanical composition; or proximity to semi-natural habitat and/or protected sites such as Local Nature Reserves. It is therefore inappropriate to make any comparisons between gardens in this study.

More detailed and structured surveys of British gardens on a large scale would appear to be limited. There is a well-known garden in Leicester which was intensively studied by the Owens over a thirty-year period (Owen, 2010) but there would appear to be limited information on ongoing garden surveys. Russell-Smith (2002) and Thomas (2002) provided some notes and information about garden spiders from Kent and Bedfordshire respectively; and I (Wilson, 2008, 2010) described the garden spiders recorded intermittently in our previous Leeds garden. A search on the B.A.S. website library database (using the search string 'garden') suggests there are few articles with a focus on garden spider biodiversity or recording.

There is only one structured survey of gardens (for invertebrates, including spiders) that I (RW) am aware of: the Biodiversity in Urban Gardens (BUGS) project. This project studied just over 60 gardens in Sheffield (South Yorkshire), the results of which were reported across a series of publications that remain available on their website: www.bugs.group.shef.ac.uk/BUGS1/bugs1-index.html. Of relevance to this project is the paper by Smith *et al.* (2006) which reported on the invertebrate biodiversity of these gardens, including spiders. They deployed pitfall and Malaise traps, as well as collecting leaf-litter and extracting the invertebrates using a Tullgren Funnel. Whilst the BUGS methodology was different, the lockdown survey reliance on vacuum sampling would have at least sampled a similar fauna (at ground level within the litter layer and lower field layer). For example, spider species-richness per garden was generally low compared to the species summed over all gardens, as was the case in the lockdown survey. This of course, may be coincidence, and the sample size is likely to be insufficient in the lockdown survey to exclude this possibility. However, in RW's opinion, it is encouraging to consider that there is a similarity which suggests that a more prolonged and widespread study following this relatively simple methodology could have some merit, and could perhaps place the BUGS project in a wider geographic context within Britain.

Acknowledgements

Thanks to all participants (listed as authors) in this study for contributing data and providing comments on this article.

References

Cathrine, C. 2020. *Home Wildlife 1: Garden Spiders Visit 1 (Vacuum Sampling).* YouTube. https://youtu.be/coZc0Yy3EO0

Owen, J. 2010. *Wildlife of a garden: a thirty-year study*. London: Royal Horticultural Society.

Russell-Smith, A. 2002. Spiders in houses and gardens. *SRS News No. 44* **In** *Newsl. Br. arachnol. Soc*., **95**: 8.

Smith, R. M., Warren, P. H., Thompson, K. and Gaston, K. J. 2006. Urban domestic gardens (VI): environmental correlates of invertebrate species richness. *Biodiversity and Conservation*, **15**: 2415–2438.

Thomas, T. J. 2002. Notes on home and garden collecting. *SRS News No. 44* **In** *Newsl. Br. arachnol. Soc*., **95:** 8–9.

Wilson, R. 2008. The spiders of a suburban garden in Leeds, West Yorkshire (Part 1). *Newsl. Br. arachnol. Soc.*, **111**: 6–7.

Wilson, R. 2010. The spiders of a suburban garden in Leeds, West Yorkshire (Part 2). *Newsl. Br. arachnol. Soc.*, **117**: 1–3.

*Corresponding author: 29 Primley Park Lane, Alwoodley, LEEDS, LS17 7JE; e-mail: riwspider@yahoo.co.uk