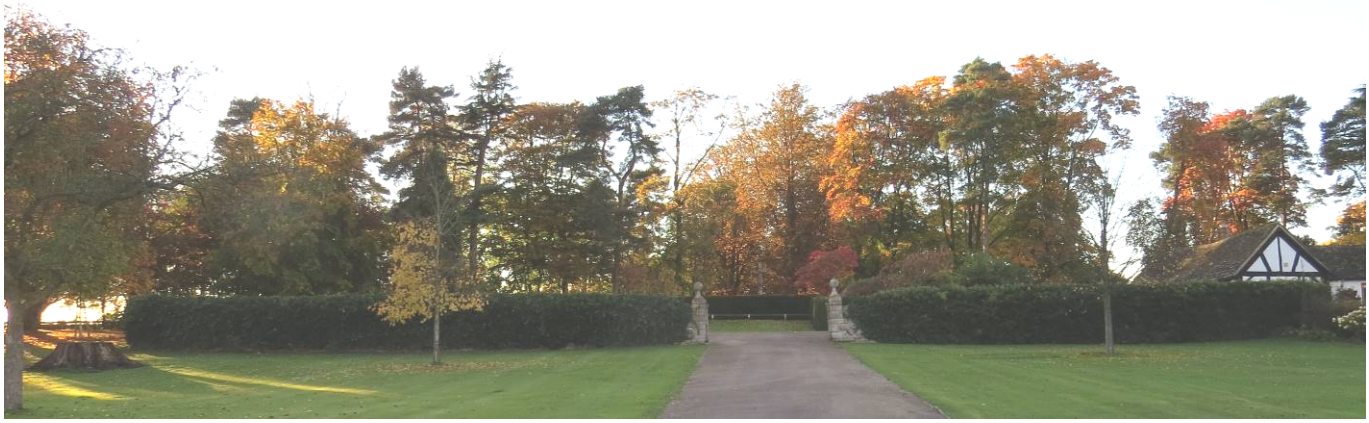


02. Ivy covered wall where many observations of *Nigma walckenaeri* were made.

Observations on *Nigma walckenaeri*, Worcestershire 2015

Jean Young

I was first introduced to the small green spider *Nigma walckenaeri* by Harry Green on 17 October 2014. He had come to Besford to check-out a Jet-Black Ant *Lasius fuliginosus* nest that had been exposed at the base of a dead tree that had fallen over. After examining the fascinating structure of the ants' nest, and the rather active occupants, as often happens with wildlife watching whilst looking for one thing you find something else of interest. Harry spotted a stone wall covered in mature ivy *Hedera helix*, prime habitat for *Nigma walckenaeri* as the upturned leaves provide an ideal surface for spinning a sheet web or retreat across. Within a few seconds of scanning the ivy he found a spider underneath a web along with a couple of flies it had captured.

I did not see any more of these spiders over the rest of the autumn and winter, although based on my experiences this year (2015) that may have been due to a lack of concentrated effort rather than absence! On 05 December 2014 I spotted what looked like a spider egg sac on one leaf, a web in a curled up leaf immediately below it and just below that another leaf with a small thick sheet web across the upper surface (01). I wasn't able to find anything online to confirm whether or not these were *Nigma* egg sacs and webs. I was particularly intrigued by the thick web: was it a winter retreat? If it was I would have expected it to be tucked away somewhere a little less exposed and the same for the egg sac. There does not appear to be much in-depth information available online or in books about this spider especially with regard to the egg sacs and spiderlings. Rather than cover what is already known about the spread of the spider I refer you to John Bingham's article in the April 2014 edition of the *Worcestershire Record* and I will just report my observations over the 2015 season. [Editor's note: the distribution of *Nigma* has expanded enormously in Worcestershire in recent years and information on this will appear in *Worcestershire Record* April 2016].

In early autumn 2015 Harry spotted his first *Nigma walckenaeri* of the season from a car. Bearing in mind that this is a green spider generally up to 5mm long maximum, finding one on green leaves close up can be quite a task, so seeing it from a car is most impressive, maybe it was a web that first caught his attention?! Spurred on by this news and knowing very little about spiders I thought it would be good to learn a little more about this one, so I started scanning our ivy and had my first success on the 12 September 2015. Little did I know that over the next few months I would be spending a lot of time staring at ivy. Fortunately most of my neighbours are used to my strange habits and either ask what I'm up to or give me a wide berth.

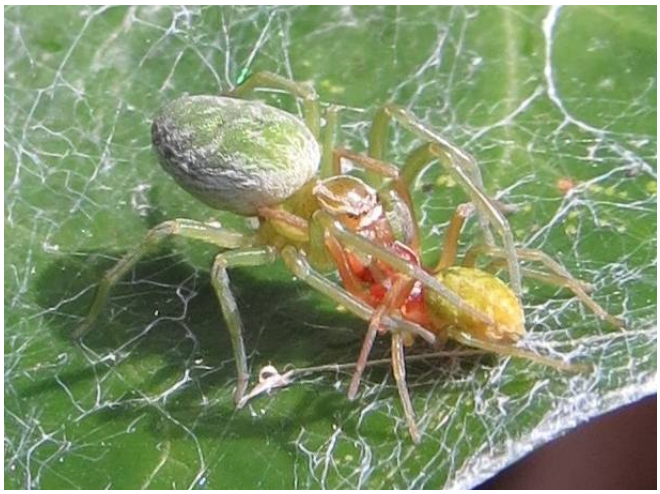
01. *Nigma walckenaeri* egg sacs and webs

The wall that I have been studying is an ornamental stone wall that is at least 100 years old, roughly 40 metres long and covered in mature ivy on both sides with the flowering ivy mainly along the top edge (02). My first sightings were of what appeared to be a mating pair under a web and two other males nearby, presumably waiting in the wings in case the first suitor was rejected or eaten. Initially I spotted

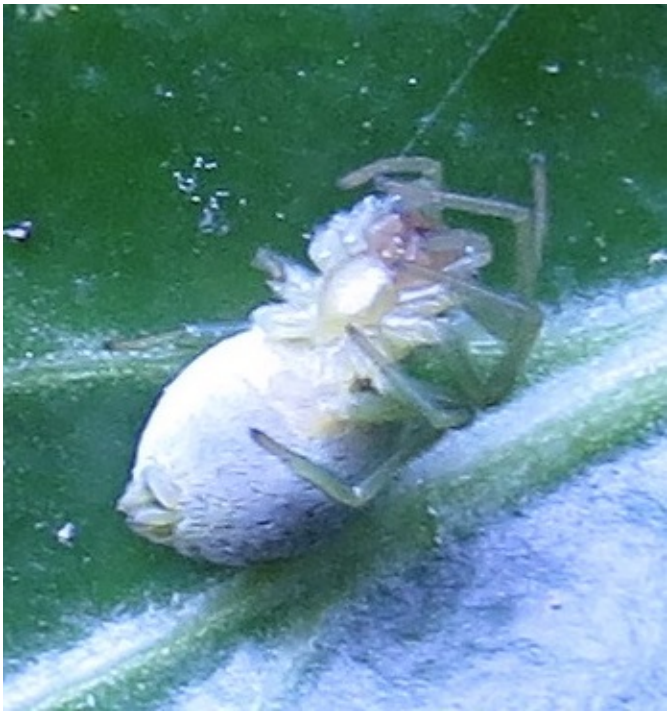
just a few spiders but as I continued to watch I was easily finding dozens in a fairly small area so the wall must support a good sized population. Initially it appeared that all the spiders were to be found on the east facing side of the wall, however I did eventually find them on the west facing side although not in such abundant numbers. Mature ivy provides excellent habitat for the spiders but they can also be found on other shrubs and trees that have suitable leaves (with upturned edges). I have found them locally on Privet *Ligustrum*, *Berberis* sp (03), *Cotinus coggygtia* and Elder *Sambucus nigra* although only in small numbers.

03. *Nigma walckenaeri* female on *Berberis*

The females are significantly bigger than the males and are fairly easily distinguishable from the male by their colour differences (04). Both sexes have some white hairs on their green abdomen giving them a 'frosted' appearance. In some cases a subtle variation in colour was noticeable as the abdomen of the females was a slightly duller minty green whereas some of the males were a brighter yellowish/limey green. The males have a rust coloured cephalothorax (the combination of head and thorax) and I noticed their legs tend to have a pinkish tinge, in some cases on all the legs and in others just the ones towards the front. On the few occasions that I've seen the underside of the spider it was white (05).

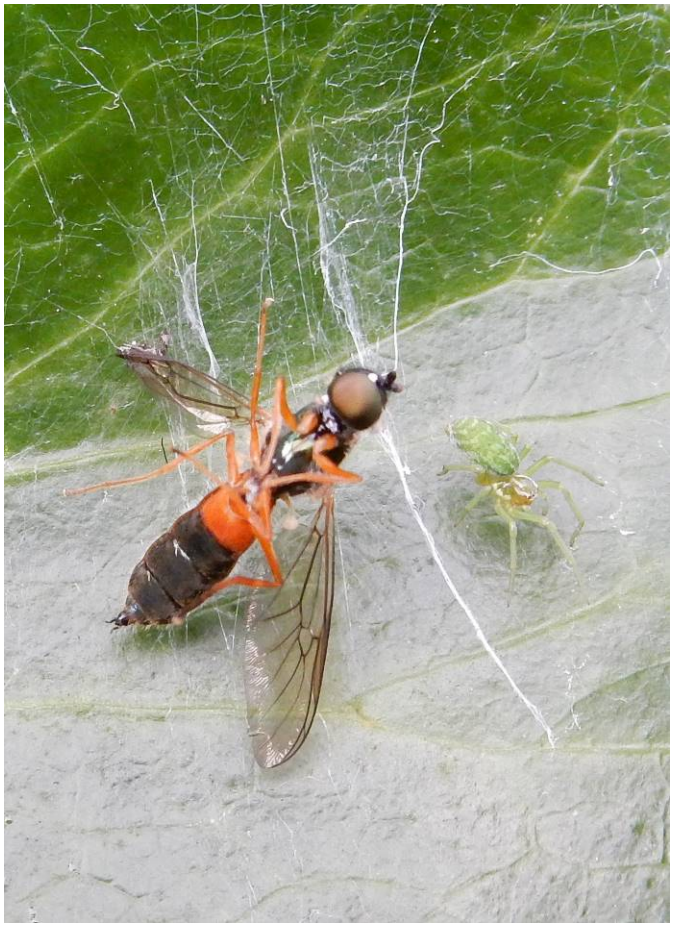


04. *Nigma walckenaeri* male (R) and female showing colour difference



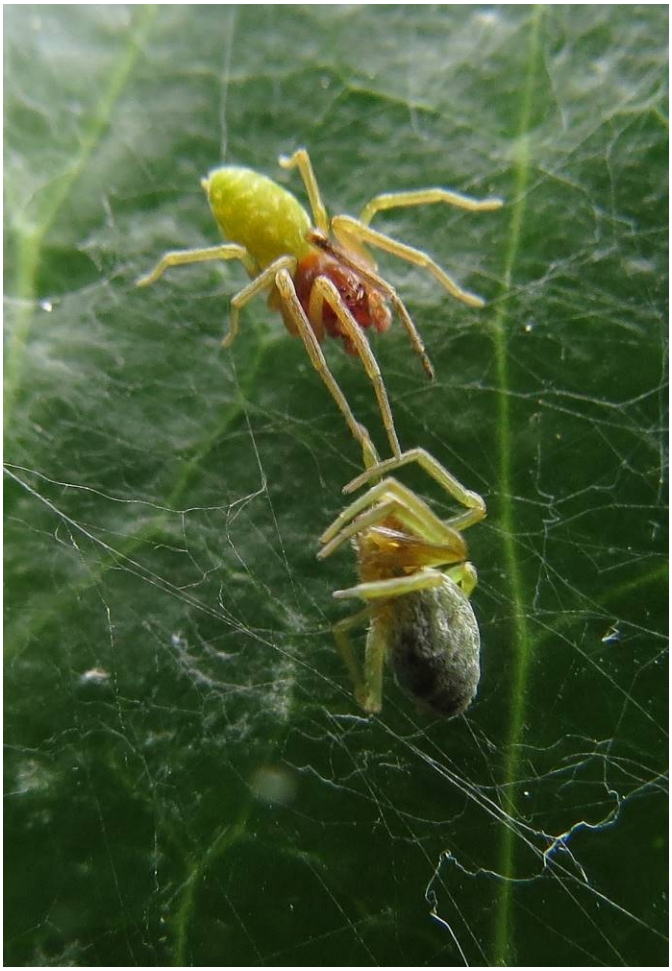
05. Underside of *Nigma walckenaeri*

The prey of these spiders is varied, I saw many species of fly in their web and several of their own species being despatched. Pictures 06-14 show examples. I was surprised to see that size seems to be no object as many of the flies were larger than the spiders and some put up a spirited fight in an effort to escape but to no avail. I have several video clips of these tussles all of which had a happy ending – for the spider! The only thing that a spider seemed to reject as inedible was a small snail (15). It tentatively reached out to touch the snail and after making contact swiftly retreated. The ivy started to buzz with life as the flowers came out and the pickings became richer for the spiders. I saw many leaves littered with bodies and spiders dashing around to keep up with the incoming banquet. On a few occasions I saw a spider subduing one fly as another was caught in the web and started to struggle. The spider would leave the first fly to deal with the new arrival, meanwhile the initial fly continued to struggle but trapped by the silk and weakened by venom it was going nowhere. I came across several flies on leaves that didn't fly off on my approach, they were alive and moving but on very close examination I could see the odd fine strands of spider silk which were just enough to trap them. It seems that the odd messy strands of silk can be just as effective at catching prey as the mesh sheets. Often when I saw a female dealing with some prey a male would be close by or move in as she was engrossed with her task. I wasn't sure whether he was hoping to share or steal her food, or mate with her while she was preoccupied.



06. Female *Nigma walckenaeri* with soldierfly *Sargus bipunctatus* prey

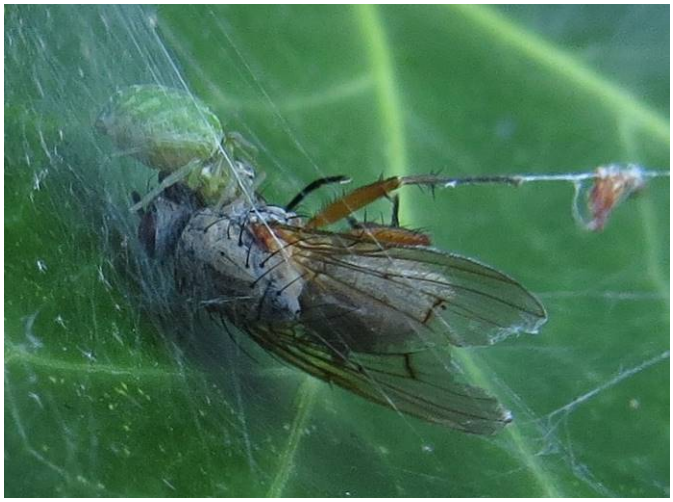
07. Female *Nigma walckenaeri* with fly.



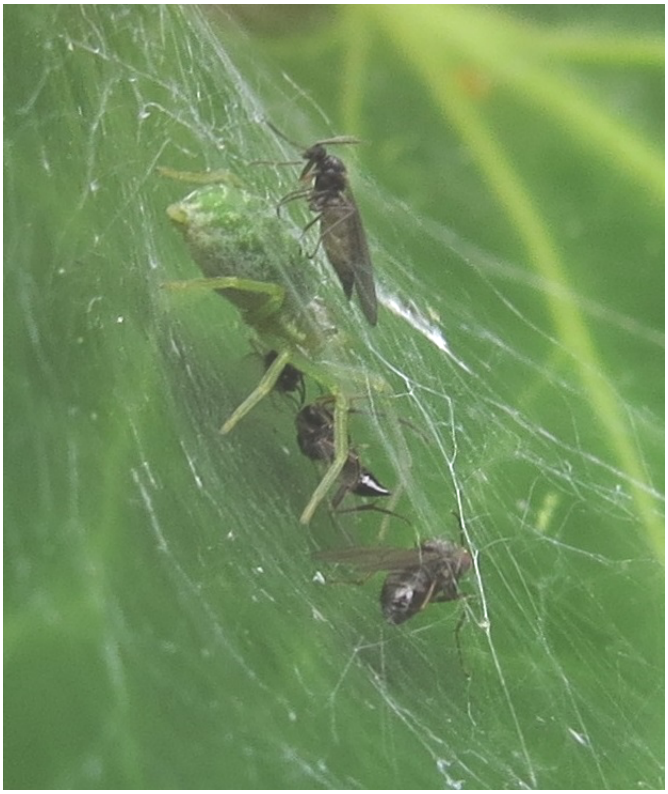
08. Male *Nigma walckenaeri* capturing female *Nigma walckenaeri* as prey

09. *Nigma walckenaeri* male with female *Nigma walckenaeri* as prey

10. *Nigma walckenaeri* female with another smaller female as prey



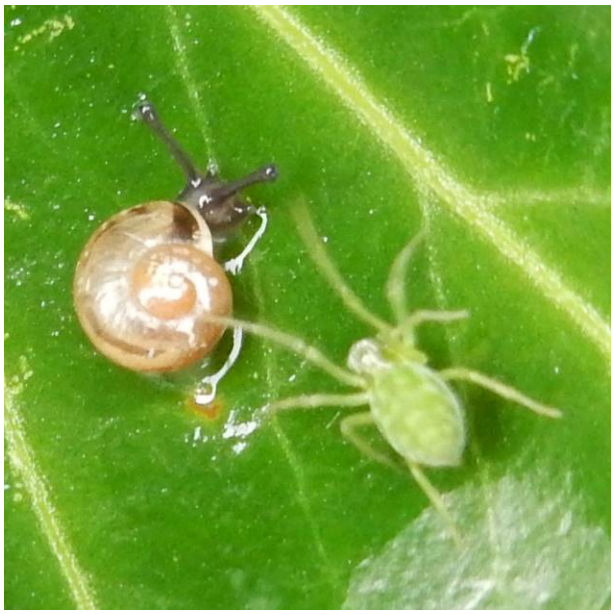
11. *Nigma walckenaeri* female with large fly



12. *Nigma walckenaeri* female with abundance of prey

13. *Nigma walckenaeri* males wrestling, female with prey

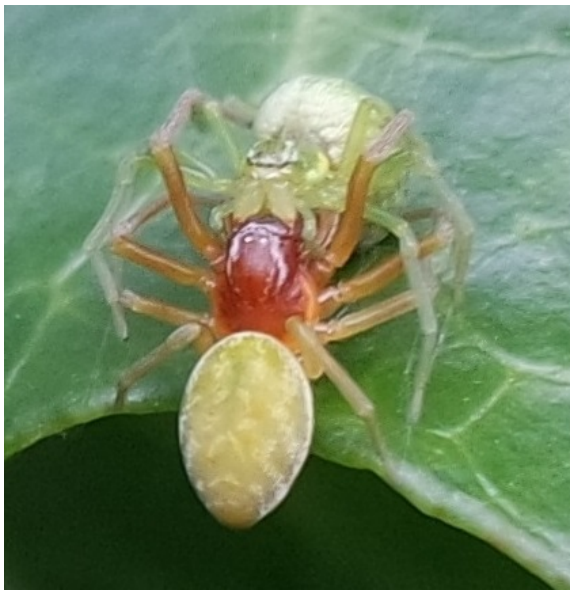
14. *Nigma walckenaeri* female with limoniid cranefly, *Limonia nubeculosa* prey, male moving in



15. *Nigma walckenaeri* female with snail

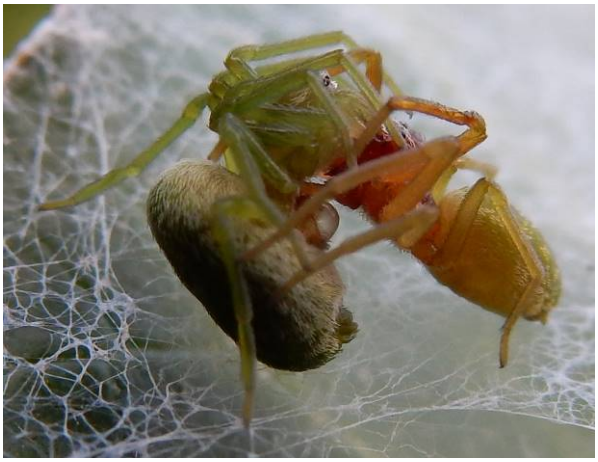
I saw quite a few face to face meetings between male and female where they had a tussle while the male tried to persuade the female that he was a possible mate rather than a meal. From time to time a female was courted by two males; sometimes the males wrestled in the vicinity of the female. Occasionally there was a three-way wrestling match including the female but inevitably one of the males eventually sloped off defeated, but alive.

From mid September to early November I found mating pairs almost every time I checked the ivy. The female generally held her abdomen perpendicular to the leaf, faced by the male holding his body at a similar angle. The chelicerae ("jaws") of the male were held near the base within the female's chelicerae (16, 17, 19). Locket & Millidge (1951) state that the males have a swelling near the base of the chelicerae and when these are gripped by the female the pair are fixed in the correct position for him to pass over his sperm using a palp. I don't know how long they remain in this position but on a couple of occasions when I checked back half an hour later they were still in place. In one of my pictures of a mating pair I was intrigued to see what appeared to be a translucent orb between the male and female just at the back of the male's palp (18). Dr. Geoff Oxford (pers com) of www.britishspiders.org.uk kindly clarified that this was the haematodocha, the part of the male palp that is elastic and expands and collapses repeatedly as sperm is transferred to the female storage organs.

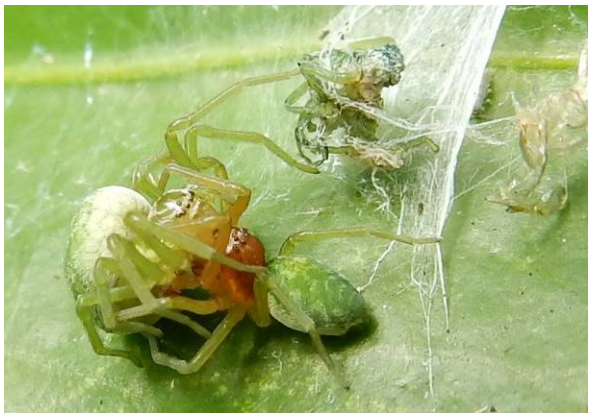


16. *Nigma walckenaeri* mating. Female gripping male chelicerae.

17. *Nigma walckenaeri* mating. Female gripping male chelicerae



18. *Nigma walckenaeri* mating pair showing transfer of sperm via palp. Note translucent dome-shaped haematodocha.



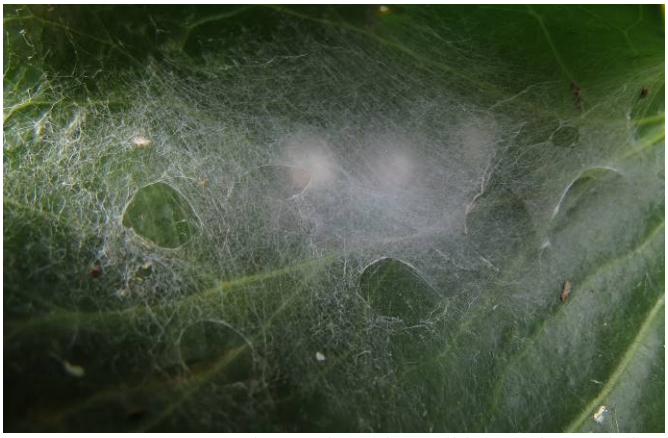
19. *Nigma walckenaeri* mating pair with remains of spider in web behind

I watched spiders spinning their webs on a few occasions and while trying to photograph and video them soon found that they were sensitive to disturbance while spinning and would stop at the slightest knock of the leaf. Quite different to when they were mating and you could get very close without disturbing them. Photographing these spiders has been rather tricky due to their small size, movement of the leaves, green reflective leaves, poor light, shallow depth of field and inability of the photographer to keep still. I have found it quite useful to take short video clips of some of the behaviour as it gives a good opportunity to study it up close without disturbing the subject. Also the photographs have allowed me to zoom in and see things I would never have spotted in the field. Watching the spider spinning using this method allowed me to see it combing out short lengths of silk with the rear pair of legs and attaching the silk to the leaf surface, a very laborious process.

I have seen many egg sacs while studying the ivy but couldn't be certain that they were produced by *Nigma walckenaeri* spiders. The ones that I suspect are most likely look like a fibrous cotton wool ball, on a few occasions I have seen the both male (20) and female (at different times) next to these egg sacs and a female with a retreat adjacent to the egg sac. I found a trio of egg sacs on one leaf which had an edge curled over sheltering the sacs on 4th October 2015 (21). As I didn't know when the egg sacs were created, how long the eggs would take to hatch, whether they would overwinter or had already hatched I thought it worth checking them regularly. I now have over 50 photos of these egg sacs and only two spiderling sightings (24/10/15 and 04/11/15). An interesting development with these egg sacs was a clutch of 10 small white shiny capsule shaped eggs laid next to the egg sacs in early November, was this coincidental or could it be eggs of a spider parasite? Since mid November I have started to see some flat sheet webs appearing with what look like possible egg clusters below the surface (22), I saw a similar web in April that had many spider moulted skins (23) in it, but again I can't be completely sure what species of spider they belong to.

20. *Nigma walckenaeri* male by egg sacs

21. *Nigma walckenaeri*. Trio of egg sacs with small capsule eggs below and spiderling exiting bottom right



22. *Nigma walckenaeri*. Sheet webs with possible egg clusters below

23. *Nigma walckenaeri*. Web with spiderling moulted skins.

I had anticipated that my *Nigma* sightings would have finished for this year by now (early December) as when the temperature dropped numbers decreased significantly. I was only seeing the odd one or two and in mid November, after a hard frost and a couple of cold days I didn't see any. However as it has warmed up again (14°C 02/12/15) I have started to see both sexes again, including a female catching a fly.

Now that my study is coming to an end for this year I have to admit that I have become an 'Ivy addict'. I was aware that the late flowering of ivy made it a very valuable plant for wildlife, but studying it at such close quarters has shown me the great variety of wildlife that uses it to feed on or live in. The only problem is that you start noticing it everywhere, B&Q car parks, country lanes, National Trust properties, city walls and you just have to check it out in case it has *Nigma walckenaeri* to add to the WBRC records. I started the year thinking that this little spider was quite uncommon, but have found that now I know what to look for I can find it practically everywhere I look that has mature ivy. It is obviously doing rather well and spreading round the county which is good news as sadly my particular study area is under threat as it is a listed wall and due to undergo maintenance as it is starting to fall down.

It has been an interesting exercise and has introduced me to the intriguing world of spiders and their neighbours in the ivy. Yet in writing this it has made me realise that even with my hours of observation how little I know and how many questions are raised. What happens over winter, how long do the eggs take to hatch, at what stage can you identify the spiderlings? etc. etc. It's easy to watch and think you know what is going on and far too easy (especially for me) to anthropomorphise so it's probably best for me to simply observe and leave it for the more scientifically minded to interpret.

Thank you Harry for my project – who knows what my homework will be for next year?!?

References

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Bingham, J. 2014. *Nigma walckenaeri* (Roewer (1951) (Aranae). An established spider in Worcestershire. 36:112-13.

Images

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