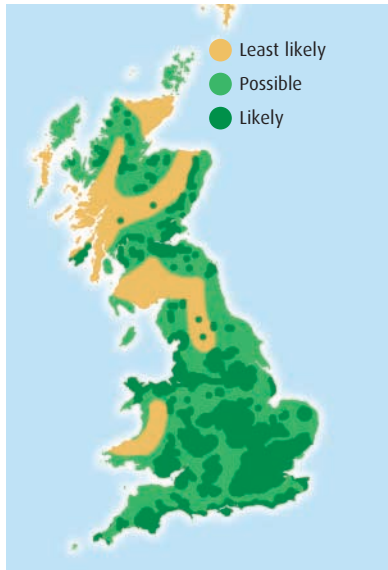




Based on Spider Recording Scheme data 2016



Zygiella x-notata in Britain

Where are they?

Zygiella x-notata is very common throughout Britain although rather more scattered in the north. It is less common on higher ground, which is unsurprising given its close association with human habitation.

Geoff Oxford

Missing-sector Orbweaver

(*Zygiella x-notata*)



Advancing Arachnology

Fritz Geller-Grimm



Female Missing-sector Orbweaver (*Zygiella x-notata*)

Often on structures such as these garden railings, *Zygiella* webs almost touch one another.

For more information:

britishspiders.org.uk/srs_missing-sector_orbweaver

The British Arachnological Society

The BAS is Britain's only charity devoted exclusively to spiders and their relatives. We use science and education to advance the wider understanding and appreciation of arachnids, and to promote their conservation.

Find us at: www.britishspiders.org.uk

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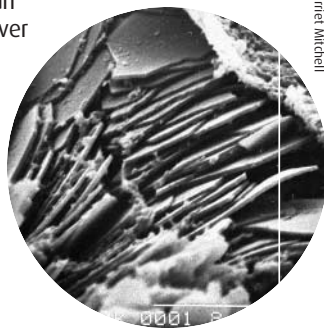
Female *Zygiella atrica*

Evan Jones

blackthorn bushes, on the trunks of pine and birch trees and, in open country, on metal signposts and gates. On the coast, it can be found on rocky shores, cliffs and sea defences. It is generally pinker in appearance than *Zygiella x-notata* and with a conspicuous red patch on the 'shoulders' at the front of the abdomen. The third species, *Stroemiellus stroemi* is a rare spider almost confined to central southern England, where it lives on deeply fissured trunks of pine and large oak trees.

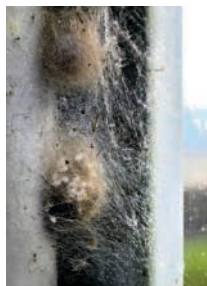
Why do they look silver?

The abdomens of *Zygiella* species have a distinctive, silvery sheen. Intriguingly, this is for exactly the same reason that fish scales look silver. Very thin, light-reflecting crystals of a substance called guanine are stacked within the scales of fish and also beneath the skin of these spiders. IT is clearly an advantage for fish to be silver as, from below, they are camouflaged against the bright water surface, but how this colouring helps spiders is still a mystery. This is a good example of convergent evolution –



Harriet Mitchell

Guanine plates in a long-jawed spider - the structure in *Zygiella* is almost identical.



Geoff Oxford

Zygiella x-notata egg sacs on a window frame. White egg shells from emerged young are visible in the lower sac.

How to recognise a Missing-sector Orbweaver

The adult spiders themselves are distinctive but it is the web that is the complete giveaway. The spider spins a flat, round orb-web like the familiar Garden spider (*Araneus diadematus*) but, crucially, there is usually a segment – or sector – missing (see opposite).

There are two other, very closely related, species in Britain which also spin webs with missing sectors. *Zygiella atrica*, although widespread, is usually found well away from habitation, for example on gorse and

FACT FILE

Missing-sector Orbweaver (*Zygiella x-notata*)

Body length:

males, 3.5 – 5 mm; females, 6 – 7 mm.

Appearance:

- Cephalothorax (front section of body) - medium brown with a darker brown, central, roughly wedge-shaped mark at the front, and dark edges.
- Abdomen (back section) - the brown leaf-like mark on the back has a paler

surround. The background to the whole abdomen often has a silvery sheen.

- Legs - light brown with vague, darker marks.

Habitat: window frames both inside and outside the house, under window sills and guttering and often on car wing mirrors. Also found on garden shrubs and gate posts but usually in close proximity to human habitation.

where totally unrelated species develop similar features independently.

Life history

Like most spiders, *Zygiella x-notata* can only be identified reliably when adult. Mature females have been recorded throughout the year, but mostly in late summer and autumn; mature males are found between mid-summer and early autumn. The spider is active all year round. It is not unusual to see newly-built orb-webs even in winter on mild days. Mating takes place in mid- to late-summer, when the male may be found cohabiting with the female within her retreat, spun in the right angle of a window frame or wall. Eggs are laid in autumn and winter and encased in protective, silk sacs. These are attached to solid surfaces, usually near or within the female's retreat. The egg sac, about 8-10 mm across, has an outer layer of loosely woven, rather wiry, yellowish silk. In early spring the sac appears mottled when the dark young hatch from the eggs, before emerging. Each female can produce two or three egg sacs and stays with them through most of the winter. Most females mature and reproduce in the year in which they hatch but some wait for the following year, when they are about 18 months old. They spend the winter in holes in external walls.

Unique web design

The unique characteristic of *Zygiella* webs is the missing sector. Through this web-free segment runs a single silk strand (the signal line) that connects the centre of the orb-web to the spider's retreat. Here they spend the day waiting for prey to arrive; at night they can be found at the hub of the web. The reason for this particular design is that the retreat is often in almost the same plane as the web. Without the missing section the spider would have to climb across the web surface when prey arrives. The empty sector and signal line enable the spider not only to detect the arrival of prey in the web from the



I. Paschlos

Zygiella x-notata web with the usual missing sector (above) and without the missing sector (below). Note that in the photograph below, the spider's retreat in the rolled begonia leaf (arrowed) is almost at right angles to the plane of the web.



Geoff Oxford

vibrations in the signal line but also to reach the web's centre directly and very quickly. Interestingly, when the spider builds in such a way that the signal line from the retreat is at a greater angle (about 40° or more) to the flat surface of the web - then a full orb is produced. The spider's web-building skills are therefore flexible and sensitive to the relative orientation of web and retreat. The web is also affected by food supply, with larger webs built when prey is scarce.