Life and death on the back of leaves

Jean Young

During Spring, Summer and early Autumn I while away many a happy hour peering at flowers and leaves, observing a multitude of wildlife busily going about its business. However, as autumn draws to a close and we move towards winter it's tempting to stay cocooned inside where it's warm and cosy. Fortunately my natural curiosity gets the better of me and I venture out to see what I'm missing. On one of my forays last year, I did something that I rarely do, and it opened up a whole new world for me. This simple action was to turn over a leaf. A group of nibbled leaves (01) caught my attention and I was hoping to find some clues as to what had caused the damage.

Well that was a WOW moment, there was so much going on under there! Some things I recognised but many were a total mystery to me, and some still are. Having spent the last couple of years looking on the surface of ivy leaves for little green spiders *Nigma walckenaeri* I now found myself addicted to turning leaves over. The first leaf I looked at provided a good snapshot of life and death in the insect world, there were eggs, mites, barkflies, scale insects, a hoverfly pupa and parasitised aphids. As I started investigating the underworld it became clear, based on the variety of eggs I came across, that many insects and arachnids start their life hidden away on the underside of a leaf.

As I continued to check leaves I discovered that biological pest control is working well here as there were many mummified golden and black aphid 'shells' with exit holes where parasites had emerged. One of the strangest I came across was a brown circular disc with a raised lump in the middle. On investigation I was surprised to find that it was the remains of an aphid that had been parasitised by a *Praon* wasp (Hymenoptera: Braconidae). Once the egg that had been laid inside the aphid had hatched, and the larva developed, it emerged beneath the aphid's mummified shell and pupated in a volcano-like cocoon attached to the underside of the remains of the aphid. A very bizarre looking sight, especially as the head, legs and antennae were missing from the first example I found, making it rather difficult to guess its aphid origins!

I also found a different type of parasite at work when I came across a fly that didn't make a quick exit as I turned over a leaf, the pale stripes on its body are where it had been affected by an entomopathogenic fungus. It's intriguing to think that the Entomophthora fungi can change the behaviour of a fly causing it to position itself in a high spot, ensuring better dispersal of the fungal spores. This type of fungus is a fairly new discovery to me so in my ignorance when I came across a fly with a strange looking white face I thought that it too had been infected. Fortunately our local experts were on hand to put me right and confirm that the fly was a Thick-headed fly (Conopid) in the genus *Myopa* and the white face, although appearing strange is normal! (Thanks Mick Blythe and John Bingham).

Some of the tiny characters I came across were a strain on the eyes but a delight to observe as they rushed around, who can resist the charms of a globular springtail? The delicate looking barkflies (Outdoor Psocoptera) were very active and my suspicions that they may be responsible for the messy debris seen under some of the leaves proved to be correct when I photographed one in the act of 'making a small deposit'. On my regular visits to the hoverfly pupa I often found it seemingly attended by barkflies. I was hoping to establish what the pupa turned into but was intrigued to know what, if anything the barkflies were gaining from their visits. Keith Alexander of the Barkfly Recording Scheme helpfully confirmed that they feed on encrusting fungal and plant material and moulds growing on faecal pellets and that as some species produce silk, keeping faecal pellets attached to the silk may maintain a food supply. So it appears that I may have found barkfly larders on the leaves which had a messy tangle of silk and faecal pellets.

Unfortunately although it was interesting to observe the hoverfly pupa over several months and see some developments within, sadly it disappeared leaving me none the wiser as to what it turned into or whether it was just a useful structure to attach silk to or was supplying anything that may have been of value to the barkflies.

My leaf turning also unearthed leafhoppers, ladybird pupa, a parasitoid wasp, some mystery cocoons/pupa and anyone wishing to test out their new *Wild Guide To Britain's Spiders* would be off to a good start if they turned over a few leaves as I encountered a good variety of both spiders and their egg sacs.

The undersides of leaves are fascinating places to explore and there are many mysteries to unravel, including who it was that nibbled those leaves that first caught my attention!? I hope I have encouraged you to turn over a new/old leaf, release your inner Sherlock Holmes: who knows what clues you will discover as to the goings on in the underworld?

A few hints and tips for your explorations:-
Don't forget your hand lens – most things found under leaves are tiny. Alternatively take a photo if something is so small that you can't be sure if it is of interest or not, have a look at your photo in the field on the camera screen and zoom in for a better view.

When looking under holly leaves use gloves and remember noses and eyes are rather delicate (easy to forget when peering at something fascinating with your hand lens in the midst of a holly bush – here speaks one who knows!).

Try crouching down to look up at the underside of leaves to spot any potentially interesting ones, it's quicker than turning them over one by one.

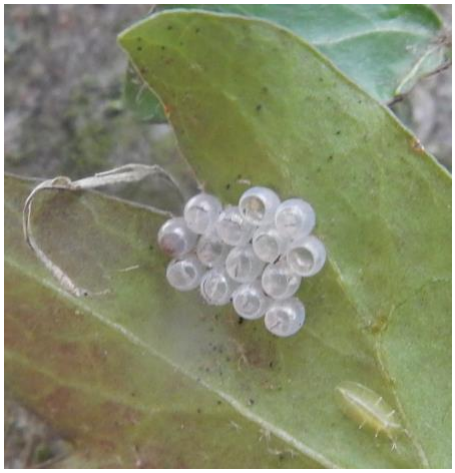
Don't just restrict your leaf turning to the end of the year, there's plenty to discover all year round. Happy hunting!

01. Nibbled leaves - How it all began 04Jan17. Jean Young.

02. Egg sac of Pirate spider *Ero* 01Mar17. Jean Young.

03. Eggs of unknown origin. 01Feb17.02. Jean Young.

04. Eggs possibly Dock Beetle 07May17. Jean Young.



05. Eggs possibly shield bug 21Dec16. Jean Young.

06. Aphid parasitised by *Praon* wasp 15Mar17. Jean Young.

07. Parasitised aphid and bark fly Psocoptera 12Nov17. Jean Young

08. Fly infected by entomopathogenic fungus 23Mar17. Jean Young.

09. Conopid fly *Myopa* sp. 25Apr17. Jean Young.

10. Globular springtail possibly *Dicyrotomina saundersii* 01Feb17.

11. Barkfly, Psocoptera, producing dropping 15Mar17. Jean Young.

12. Barkflies *Graphopsocus cruciatus* 09Oct17. Jean Young.

13. Hoverfly pupa, bark flies and Scale insect 15Mar17. Jean Young

14. Ladybird pupa 16Feb17. Jean Young.

15. Leaf hopper possibly *Zygina flammingera* 29Mar17. Jean Young.

16. Mystery cocoon 04Jan17. Jean Young.

17. Parasitoid wasp under holly leaf12Nov17. Jean Young.


18. Scale insects and unidentified possible pupa 03Nov17. Jean Young.


19. Spider under holly leaf 07Sep17. Jean Young.


20. Spider under holly leaf 08Sep17. Jean Young.


21. Spider under holly leaf 28Sep17. Jean Young


22. Spider under ivy leaf 16Feb17. Jean Young.


23. Spider with egg sac 31Aug17. Jean Young.

Images
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