

## A *Stylops* Afternoon

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It used to be classified as an abnormal beetle, it's the symbol of the Royal Entomological Society and the writer and coleopterist Richard "Bugman" Jones has never seen a live specimen.

Neither had Rosemary Winnall and I until March 20 2019 when we were surveying the first flush of spring insects in her garden at Bliss Gate. It was a bright, sunny afternoon and we'd already found a scarce sawfly *Sciapteryx soror* when we stopped to admire a flowering *Viburnum tinus* bush in late afternoon sunshine. Here, several solitary bees *Andrena bicolor* and *A.praecox/apicata* were basking on the sun-warmed foliage. As we watched them our attention was drawn to a number of white-winged black-bodied "flies" darting erratically over the foliage. Occasionally one would land and whirl around on the surface displaying very broad fan-shaped hindwings. The penny dropped for us both: these were no flies, they were male *Stylops*.

*Stylops* are Strepsipterans, peculiar insects which were once thought to be beetles, but which molecular analysis has now placed closer to flies. In Britain, they are endoparasites of leafhoppers and homopteran bugs, but the most familiar group, lumped into one convenient species until the taxonomists reach agreement, is *Stylops melittae* a parasite of solitary bees. On our garden tour we had already noticed several parasitized bees. *Stylops* does not usually kill its hosts, but can cause them to show mixed sexual characters. These "stylopized" individuals are easy to recognise because the hardened head of the female *Stylops* protrudes from between its abdominal plates.



*Andrena* bee with female *Stylops*

Rosemary Winnall

A female *Stylops* has no legs or wings and only primitive eyes and antennae. She begins life as an egg inside her mother's body, which hatches, still inside the mother, to produce an active larva called a triungulin. When the host bee visits flowers, the triungulin is released by its mother onto the blooms. There, if it is lucky, it will find another visiting bee to transport it back to a nest.

Once in the nest-burrow, the triungulin adopts a bee larva or a pupa as its host. It secretes enzymes which dissolve the host's outer cuticle and burrows its way into



Male *Stylops*, Bliss Gate, March 2019

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Male *Stylops*, Bliss Gate, March 2019

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*Andrena nigroaenea* with mating male *Stylops*, 20 March 2019

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the body tissues to feed on its blood (haemolymph). If it's a female *Stylops* it will spend the rest of its life inside its host, feeding and breeding there. If it's a male, when it is mature, it will fly off in search of a mate.

Life is sweet, but very short for the adult male *Stylops*. They live for as little as an hour or two and in this time have to find a female whose only visible sign is a protruding head on the abdomen of an active solitary bee. It seems a daunting task, but is made much easier by the pheromone trail that the female emits, guiding the males towards her. The males we saw on that warm March afternoon were spiralling in to find females which had parasitized the basking bees. We didn't see any mating at the time, but when we examined our photographs of the *Andrena nigroaenea* that we'd taken earlier, we noticed that there was a male *Stylops* attached to the end of its abdomen, busy copulating with a female *Stylops*. Very little of her protrudes, so he inseminates her through her brood-canal which opens just below her head.

After this, he dies.

We counted ourselves very lucky to have been there at the precise moment that the *Stylops* emerged and even luckier later when I managed to catch one in flight over

the table where we were having afternoon tea. Closer examination of this ephemeral insect revealed its milky wings fanned like a magician's cape, contrasting with its black body. The antennae were forked, presumably for the better detection of pheromones and the simple eyes were like tiny blackberries. We were surprised that the males could fly well with such huge curtain-shaped hindwings, but they are apparently aided by the broad halteres, which project like handlebars from below the eyes. These halteres act as flight stabilisers for many fly species, but in the Diptera replace hindwings and not forewings. This is one of the characters which distinguish the Strepsipterans from Dipterans.

These bizarre insects can be very widespread and sometimes locally common as examination of solitary bees in spring and early summer will often prove. The larger solitary species such as *Andrena nigroaenea* and *A. scotica* seem to be popular hosts, but we have also seen *Stylops* on smaller species such as *A. bicolor*. They will parasitise male or female bees.

We are not sure what the ideal conditions are for observing male *Stylops*, but a still warm day in early spring and a sheltered spot with broad evergreen leaves ideal for basking bees, could provide you with the sighting of a lifetime.