For many of us, the arrival of the Dark-edged Bee-fly *Bombylius major* in the spring is a welcome sight. For those not yet converted, you have a treat in store if you've spare time on a sunny day to watch them.

Dark-edged Bee-fly *Bombylius major*

Of the four British Bombyliids, *B. major* is the only species recorded within the LNHS boundary. Common and widespread throughout the London area, they're as likely to be seen in urban gardens as in more open areas, so no big expedition is necessary to seek them out.

With their extraordinarily long proboscis they're able to feed on nectar from a range of flowers including those spring hedgerow species such as Primrose, Ground Ivy and Dandelions. They're brood parasitoids of solitary mining bees, hovering over the ground and flicking their eggs at their nests. So it's worth watching for these flies on loose open ground, sunny hedgerow bases and dry garden corners that are suitable for bees.

They need plenty of warmth to fly, so early in the season keep an eye out for them basking in sheltered, sunny spots near to the ground. Once warmed up they may hover a few cm above the ground as the males look for females, or the females search for egg-laying sites. They can also be seen above head height, nectaring in flowering fruit trees, blackthorn and hawthorn.

Dark-edged Bee Fly *Bombylius major* first annual records within the LNHS recording area.

(NBN Atlas accessed 11/02/2021)

Year	Date	Location	OS Grid reference
2020	06/03/2020	Wanstead	TQ416861
2019	24/02/2019	Wembley	TQ175851
2018	21/03/2018	Manor Park Cemetery	TQ413856
2017	13/03/2017	Manor Park Cemetery	TQ412855

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*Figure 1. A male Bee-fly (*Bombylius major*). Note the characteristically long proboscis, the single pair of wings with darkened leading edges and held flat and away from the body, and the furry, fluffy appearance. The large eyes meeting at the midline of the head tells us that this is a male.*

Dotted Bee-fly *Bombylius discolor*

Active slightly later than its bigger relative (late March onwards), the Dotted Bee-fly was seen for the first time in Surrey in 2020 and has been recorded in Kent, Hampshire, Berkshire and Bedfordshire, but so far It's skirted our borders in London. The most obvious difference with B. major are the dotted wings.

- Click here for Martin Harveys' Bee-fly identification guide with pictures and more information

Take part in Bee-fly Watch 2021

The Annual Bee-fly Watch welcomes your records. If you're new to Bee-flies, and for early and

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late sightings, photos are appreciated. Please don't feel that these need to be perfect but do try to get as close as possible! For verification of *B. major* a picture that shows the dark edge of the wing may be sufficient.

- **Click here to add Bee-Fly records though the LNHS activity (select the 'Bee-fly Watch 2021' option)**
- Click here to learn more about Bee-flies from the Soldierflies and Allies Recording Scheme's Bee-fly Watch 2021 web page

Bee-fly (*B. major*) Reproduction

The male flies, with distinctively large eyes that touch in the midline of the head, can be territorial. They may hold territory by hovering a few metres off the ground, darting to intercept anything that looks like a potential mate or a competing male to be chased off. The females will lay large numbers of eggs, flicking them away from her body in a lunging hover. Look carefully and you may see the last segment of the female fly coated in dust. She coats the translucent 0.5 mm egg with dust to weight it down and help with getting the egg to the ground. It makes it almost impossible for us to find the eggs once she has flicked them away!



Figure 2. Oviposition - in this picture you can see the dust particles held in the "sand chamber" on the last two sternites (lower abdominal plates) of the abdomen. The more widely spaced eyes can just be seen and help to confirm that this is a female fly.

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Bee-fly larvae can be described as brood ectoparasitoids. The egg hatches shortly after being deposited and the active and legless larva wriggles, aided by thoracic and tail bristles, its way to the entrance of a bee burrow. Once the Bee-fly larva enters the underground nest of the host, it will seek out a brood cell containing the host's egg and pollen store. The larva cannot eat the pollen, instead it becomes inactive. The bee's egg hatches and the bee larva feeds to the point where it is ready to pupate. This is when the Bee-fly larva becomes active again and starts to feed, ultimately consuming its host. The Bee-fly larva then pupates over the winter. It will emerge in Spring, corkscrewing its way to the surface, leaving the pupal case sticking out of the ground.

Bees, Bee-flies and Field Observations

Solitary bees can be found nesting in a wide variety of habitats, including crevices in walls, dead trees, brambles, grass stalks, snail shells, bee hotels, and in the tunnels excavated into the ground. Bee-flies target ground-nesting mining bees. The underground tunnels and galleries contain numerous brood cells. The brood cells contain a single egg with a store of pollen, the protein source for the growing larva. The cells are sealed independently from one another. The precise organisation of the tunnels and methods used to seal the brood cells varies between species.

Mining bee nests face many challenges from parasites and predators keen to exploit the busy foraging behaviour of the female bees. Along with Bee-flies, you may also see other insects with similar designs on laying eggs or transferring their larvae to the bees' brood cells. These parasitoids and kleptoparasites include other types of flies, beetles and even other bees (more on this to come!). Don't worry as only a small proportion of brood cells are targeted successfully.

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Figure 3. It is not just Bee-flies that exploit solitary bees. Here a female Satellite Fly is following a female bee (Andrena nitida). The bee will often make zig-zagging flights as she approaches her nest site to throw off her shadow!

There are many questions still to be answered about Bee-fly egg-laying strategies and the interactions between the fly and its hosts. Is egg-laying truly targeted, as sometimes one cannot see any obvious signs of bee nesting activity? What kind of dust or sand particles do the females prefer to coat their eggs? How do the larvae find their way to been nests? What strategies are adopted by different bees to avoid the attentions of Bee-flies? How do Bee-flies cope with competition from other aerial parasitoids? So, we are keen to receive any field observations of the locations of Bee-fly egg-laying, the presence (and identity) or absence of potential hosts (usually *Andrena* mining bees) and competitors. You can send brief notes and photos to the LNHS Bee Recorder**.**

Please use Bee-fly Watch to record your Bee-fly sightings. For other sightings of bees and bee-following flies you can use iRecord to log your records. You can view the LNHS video on iRecord for more information about digital recording.

Bee and fly (other than Bee-flies!) identification can be challenging both in the field and from photographs, but you can get help from the following sites:

- Bees – UK Bees, Wasps and Ants Facebok Group
- General ID - Insects and other Invertebrates of Britain and Europe Facebook Group
- General ID (for beginners) - UKS Wildlife Identification Facebook Group

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