Moths of Poole Harbour is a project of Birds of Poole Harbour

Leaf-mines 2020

The 'Moths of Poole Harbour' (MoPH) project was set up in 2017 to gain knowledge of moth species occurring in Poole Harbour, Dorset, their distribution, abundance and to some extent, their habitat requirements. The study area shares the same boundaries as the Birds of Poole Harbour (BoPH) project.

Towards the end of the survey period, in autumn 2020, the MoPH team attended an online leaf-mine identification course which gave us the tools and confidence necessary to go out, find leaf-mines in the field and identify them. Using the book* (see acknowledgements) and a key, we collected leaf samples of known tree and plant species and proceeded to identify the mines. A number of micro-moths spend the larval stage inside the top and bottom surfaces of a single leaf, eating their way through the 'flesh' in a recognisable fashion. The patterns created in the leaf are often diagnostic. Usually, they create a 'Blotch' mine (See Fig. 3 below) or a 'Gallery' mine (See Fig. 4 below). The larvae then pupate inside or outside the leaf, sometimes creating a case or leaf fold and then emerge as the adult moth. Throughout the year, it is possible to find mines, whether occupied or not. In autumn, it is possible to find mines quite easily in the leaf litter when you know what you are looking for. The online leaf-mining website british leafminers - your guide to british and european leafmines was an invaluable guide when identifying species of moth relating to the plant species they were found on.

Carey Estate, Ballard, a garden in Hamworthy, Arne Moors, Arne Car Park and Slepe Heath were visited in November 2020 with the intention of finding leaf-mines. As one might imagine, a moth that spends most of its time inside a single leaf is very tiny and these moths may well be over-looked or unidentifiable in the field when going through a moth trap, they may not even come to light. So, the process of identifying leaf-mines gives the project another dimension to adding to the overall

species list of a site. Future surveys will undoubtedly reveal many more species using this method. It was also useful to note which plant species do not support leaf-mining moths to avoid wasting time looking on these species.

There are also non-moth species which are known to create leaf-mines, such as Flies (*Diptera*) and it was noted that these are often 'dirty' or 'messy' mines, whereas the moth mines are clean and more 'streamlined'. The MoPH found a number of non-moth mines and these are listed in Table 1 below. This also shows plant species looked at where no mines were found. All species of moth (lepidoptera) and non-moth have been entered on to Living Record.

Table 1. Non-moth species and negative results

Plant Species	Location	Date	Species
Ivy	Ballard	11/11/2020	*None found*
Wayfaring Tree	Ballard	11/11/2020	*None found*
Dogwood	Ballard	11/11/2020	*Phytomyza agromyzina (Diptera)*
Burdock	Ballard	11/11/2020	*Pegomya laticornis (Diptera)*
Hawksbit sp.	Hamworthy	17/11/2020	*Chromatomyia syngenesiae (Diptera) - not certain as not certain of plant species*
Holly	Carey	06/11/2020	*Phytomyza ilicis (Diptera)*
Snowberry	Carey	06/11/2020	*Aulagromyza cornigera (Diptera)*
Bay	Hamworthy	17/11/2020	*None found*

There are four species of *lepidoptera* known from Wayfaring tree, but despite attempts at Ballard, none were found. No moth species are known from Ivy or Holly. The mine on Holly from *Diptera Phytomyza ilicis* is widespread and common and would probably be present throughout the project area. Although at least three species of *lepidoptera* are known from Dogwood, we only found *Diptera Phytomyza agromyzina.* Although up to four species of *lepidoptera* can be found on Burdock, we only found *Diptera Pegomya laticornis* which occurs mostly in Southern Britain. There are no *lepidoptera* species found on Hawksbit and despite not knowing the exact species of Hawksbit, the *Diptera* found is likely to be the common and widespread *Chromatomyia syngenesiae.* There are several species of *lepidoptera* found on Snowberry, but on this occasion, we found the *Diptera* species *Aulagromyza cornigera*. The only moth species known to mine Bay (Laurel) is *Lyonetia clerkella,* which was found on Apple.

Fig. 1 Phytomyza ilicis (Diptera) on Holly

Fig. 2 Aulagromyza cornigera (Diptera) on Snowberry

The following tables show moth species found at each location. All are micro-moths showing Latin name. Very few species have common names, but these are shown where given.

Table 2. Moth species found at Carey Estate on 6th November 2020

Plant Species	Moth Species
Beech	*Phyllonorycter messaniella*
Beech	*Stigmella tityrella*
Bramble	*Stigmella aurella*
Elm	*Phyllonorycter tristrigella*
Hazel	*Phyllonorycter nicellii*
Hazel	*Phyllonorycter coryli*
Hazel	*Stigmella microtheriella*
Norway maple	*Phyllonorycter joannisi*
Sycamore	*Phyllonorycter geniculella*

Fig. 3 Phyllonorycter joannisi on Norway Maple

Fig. 4 Stigmella tityrella on Beech

Table 3. Moth species found at Ballard on 11th November 2020

Plant Species	Moth Species
Beech	*Phyllonorycter messaniella*
Beech	*Parornix fagivora*
Blackthorn	*Stigmella plagicolella*
Blackthorn	*Udea prunalis**
Bramble	*Stigmella aurella*

Bramble	*Coptotriche marginea**
Clover	*Ancylis badiana**
Field Maple	*Caloptilia semifascia**
Hawthorn	*Parornix anglicella*
Hazel	*Phyllonorycter nicelli*
Willow	*Ectoedemia intimella*

*Species also recorded at Ballard as adults

Fig. 5 Parornix fagivora on Beech

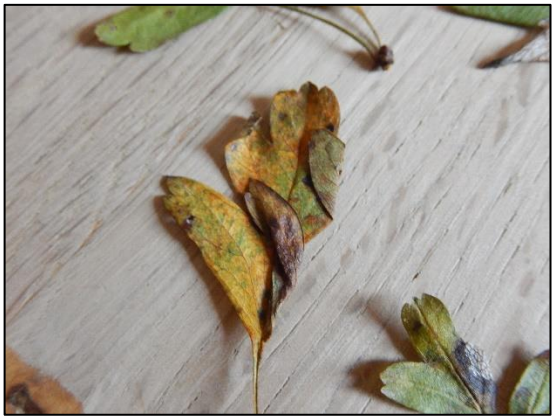

Fig. 6 Parornix anglicella on Hawthorn

– both species showing diagnostic leaf fold

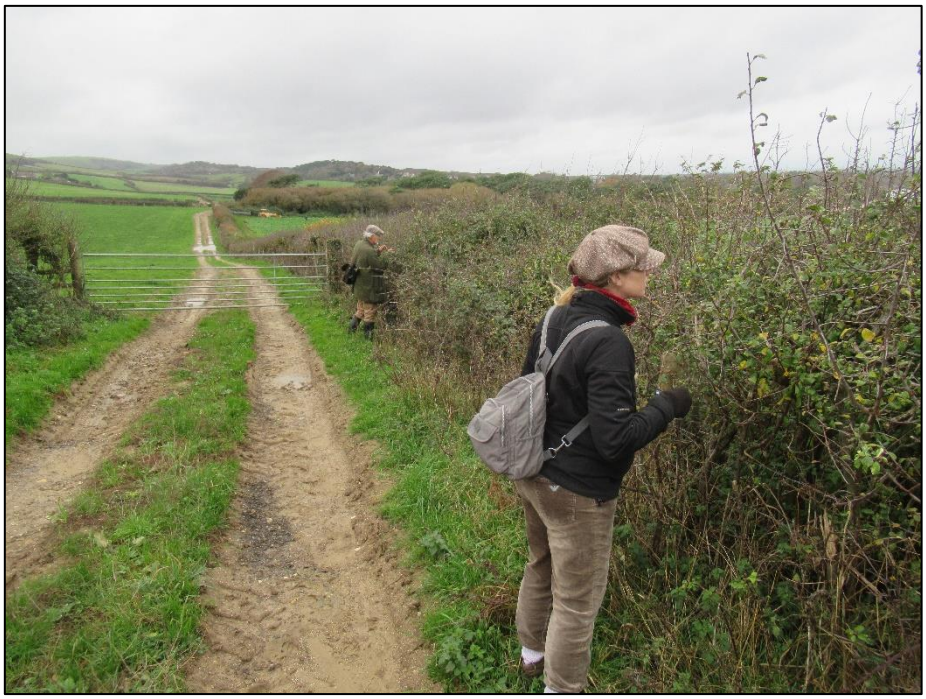

Fig. 7 Abby and Chris Fox search for leaf-mines at Ballard

Table 4. Moth species found at Hamworthy on 17th November 2020

Plant Species	Moth Species
Apple	*Lyonetia clerkella**
Bramble	*Stigmella aurella*
Camelia	*Caloptilia azaleella (Azalea Leaf-miner) **
Hazel	*Parornix devoniella*
Hazel	*Stigmella microtheriella*
Hazel	*Stigmella floslactella*
Hazel	*Phyllonorycter coryli*
Pyracantha	*Phyllonorycter leucographella (Firethorn Leaf-miner)*

*Species also recorded at Hamworthy as adults

Fig. 8 Lyonetia clerkella mine on Apple

Fig. 9 Lyonetia clerkella Adult moth

Fig.10 Caloptilia azaleella on Azalea

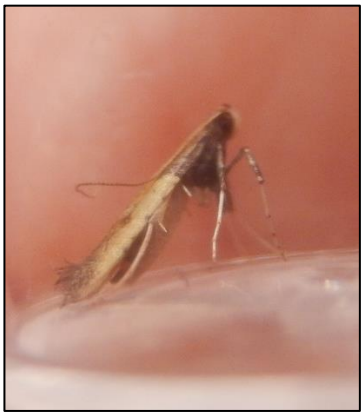

Fig.11 Caloptilia azaleella Adult moth

Table 5. Moth species found at Slepe Heath on 22nd November 2020

Plant Species	Moth Species
Aspen	*Ectoedemia argyropeza*
Bramble	*Stigmella aurella*

Fig. 12 Ectoedemia argyropeza on Aspen (tenanted mine – larva present)

Table 6. Moth species found at Arne Moors & Car Park

Plant Species	Moth Species
Bramble	*Stigmella aurella*
Hazel	*Phyllonorycter nicelli*
Hazel	*Stigmella microtheriella*
Hazel	*Phyllonorycter coryli*

Fig. 13 Stigmella aurella on Bramble

Table 7. Full species list of lepidoptera found via leaf-mines (Alphabetical)

Species	Plant	Location(s)
Ancylis badiana	Clover	Ballard
Caloptilia azaleella (Azalea Leaf-miner)	Camelia	Hamworthy
Coptotriche marginea	Bramble	Ballard
Ectoedemia argyropeza	Aspen	Slepe Heath
Ectoedemia intimella	Willow	Ballard
Lyonetia clerkella (Apple leaf-miner)	Apple	Hamworthy
Parornix anglicella	Hawthorn	Ballard
Parornix devoniella	Hazel	Hamworthy
Parornix fagivora	Beech	Ballard
Phyllonorycter coryli	Hazel	Arne Car Park, Carey, Hamworthy
Phyllonorycter geniculella	Sycamore	Carey
Phyllonorycter joannisi	Norway Maple	Carey
Phyllonorycter leucographella (Firethorn Leaf-miner)	Pyracantha	Hamworthy
Phyllonorycter messaniella	Beech	Ballard, Carey
Phyllonorycter nicelli	Hazel	Arne Car Park, Ballard, Carey
Phyllonorycter tristrigella	Elm	Carey
Stigmella aurella (Bramble leaf-miner)	Bramble	Arne, Ballard, Carey, Hamworthy, Slepe
Stigmella floslactella	Hazel	Hamworthy
Stigmella microtheriella	Hazel	Arne, Carey, Hamworthy
Stigmella plagicolella	Blackthorn	Ballard
Stigmella tityrella	Beech	Carey
Udea prunalis	Blackthorn	Ballard

Summary

It is certain that had we had the training earlier in the project, we would have found many more species to add to site species lists. That said, it is a difficult group and it's worth noting here that we started with the easiest mines to identify. For instance, we didn't even contemplate looking at Oak because there are so many species that feed on Oak. Some lepidoptera species are foodplant specific, however, some feed on a variety of plants, so it is always not as simple as *that* species of moth feeds on *that* species of tree. The very common and widespread *Stigmella aurella* (aka Bramble leaf-miner) is probably the easiest mine to find and will almost certainly be present on every site within the BoPH project area, but even that species has been known to feed on wild strawberry and agrimony. Then, there are other species of moth that will feed on Bramble, so it is worth being aware that just because you find a mine on Bramble, it doesn't automatically mean you have found *Stigmella aurella*, though the shape of the mine is diagnostic. All species recorded above are Nationally 'Common' or 'Local'.

Acknowledgements

Moths of Poole Harbour would like to thank the landowners and tenant farmer (at Ballard) for access. Thanks to Chris Fox and Brian March for help in the field. Jack Oughton for confirmation of identifications. The book*: 'Micro-moth Field Tips – A guide to finding the early stages in Lancashire and Cheshire' by Ben Smart was extremely useful.

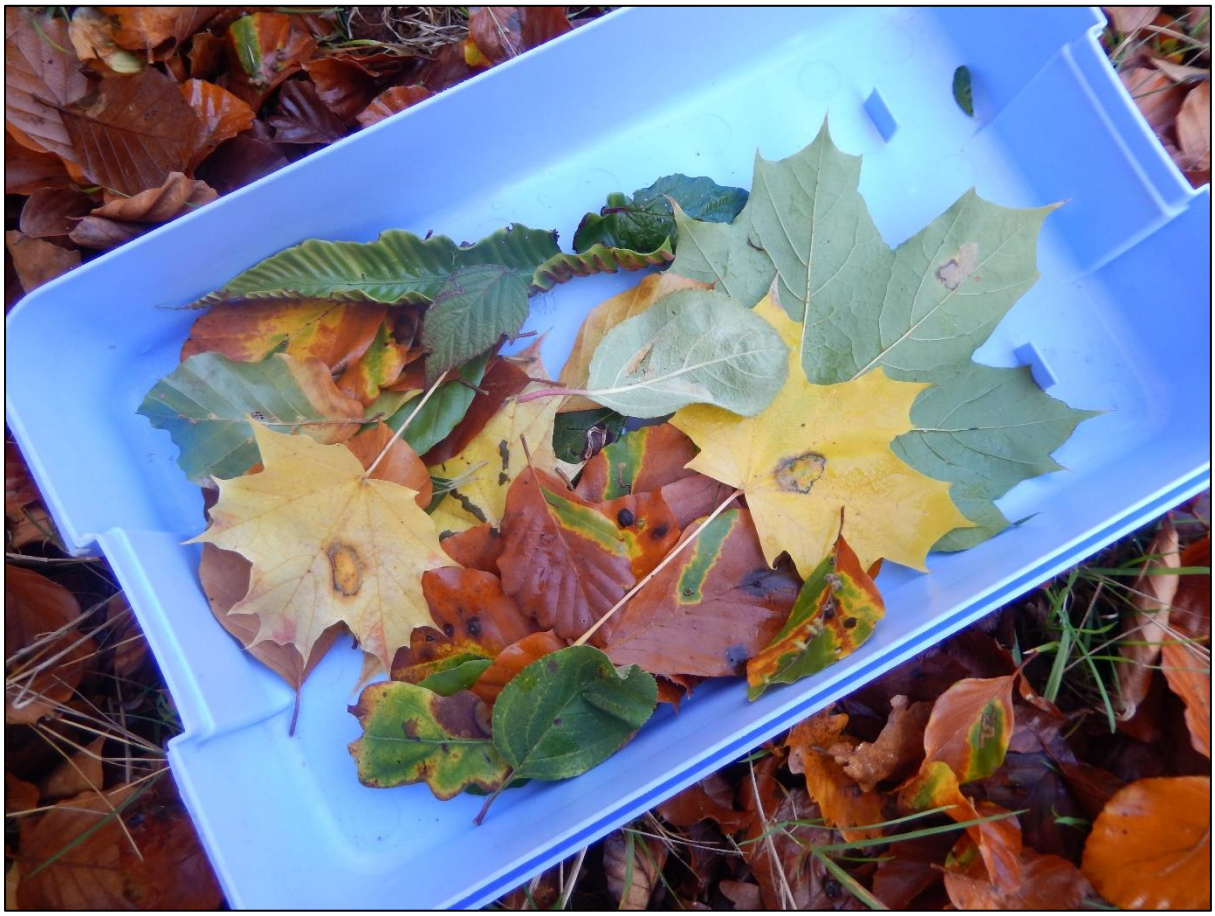

Fig. 14 Leaf collecting at Carey Estate