MOTH MUMBLINGS – LEAF-MINER SPECIAL

WELCOME

Autumn is more or less upon us, although the autumn moths are a bit slow to appear. Just as well since there is no petrol for the generators … it is time to switch to leaf-miners!

First, well done to several of you who found mines of ***Antispila petryi*** following my notes in the last "*Mumblings*". This species seems numerically scarce, but your reports are widespread and from both our counties. One person also found ***Antispila treitschkiella*** on the non-native Cornelian Cherry (*Cornus mas*). One person has reported fining ***Coleophora albitarsella*.** Also, least one person found ***Coleophora argentula*** on Yarrow seed heads and a pleasingly large number of you have reported the feeding signs and larvae of ***Epermenia chaerophyllella*** under Hogweed leaves; it is evident that this particular moth is both widespread and common. Most areas of Hogweed plants seem to be producing it this year!

Leaf-mines are currently not easy to find, with a few exceptions; they seem to be late, in keeping with many moths in light traps. However, as we approach October a great many leaf-mines should hopefully start to become evident. It is time now to look in a few books, check out a few web sites (notably www.leafmines.co.uk) and get generally clued up for the 2021 leaf-mining season!

SO, WHAT IS A LEAF-MINE?

Caterpillars of several moths and the grubs of several flies, sawflies and beetles feed internally – INSIDE the leaf rather than chomping away from the outside. Don't confuse with surface grazers that may eat only the upper or lower leaf surface and leave a scar – miners are totally within the leaf. Most of the inner leaf is consumed, leaving only the upper and lower epidermis. This renders the mine vulnerable to physical damage and so in species that make blotch mines, rather than narrow tunnels, the surfaces are usually reinforced with silk spinnings. When silk dries it contracts and the end result can be a folding (or "puckering" of the leaf).

In most cases there will be droppings (frass) within the mine. In tunnel mines it may be deposited in a narrow line or to completely fill the tunnel. In some, the frass line may be spiralled. In blotch mines the frass can be loose, in a pile or in "strings". In all cases, the layout of the frass-pattern is critical in identifying the moth caterpillar that caused it. To see what I mean, hold the mine up to the sky so the light passes through.

The caterpillar feeds inside the leaf, so by definition the adults are going to be minute! They are often missed in busy light traps and some may not even come to light in any event. In many cases, recording the leaf mine is the only way a moth can be reliably recorded. Happily, however, most species create mines that are very easily identifiable. A few need a bit of careful checking. For a further few, effort is required – to breed out and examine the adult. You will learn as you go!

There are four basic types of mines:

1. Tunnel (corridor/gallery) mines made by the caterpillar simply feeding in a linear manner inside the leaf. Some mines are straight, some wiggly. Some follow veins whilst others follow the leaf margin – some are just plain random. A few are highly convoluted (e.g., *Stigmella viscerella* mines look like your intestines (= viscera). The main group is the Nepticulidae – species of *Stigmella* and *Ectoedemia*, but some other families are represented. The egg of *Stigmella* is often visible at the start of the mine (hand lens and good light) and this instantly eliminates other groups (especially the ubiquitous Apple Leaf Miner (*Lyonetia clerkella*) in which no egg is visible). First look using transmitted light to determine precisely where the mine starts – it is often much further back than you first thought! Of critical importance is the pattern of the frass (droppings) inside the mine, whether the egg is on the upper or under surface and whether the mature caterpillar emerges from the upper or lowers surface (if it is no longer is residence there will be an exit hole).

2. Blotch mines, are where the caterpillar eats out an area of leaf. There are a great many types and blotches may sometimes these are formed by merging tunnels of a single caterpillar. Thus, some tunnels may lead to a blotch. Most blotches are full-depth and so visible both above and below the leaf but this is not always so, so look under as well as above on the leaf. Again, the frass pattern is sometimes important.

3. Pucker mines (also called tent mines) can be on upper or lower sides of leaves and the position is important in identification. When the species pupates inside the mine it may or may not cover the cocoon with frass and this might be glued to either the upper or lower internal leaf surface (or both). The main group of moths here is the family Gracillariidae – the *Phyllonorycter* species, but some *Parornix*, *Caloptilia* and others can also be involved.

4. Cones. Some miners, notably *Caloptilia* and *Parornix* species, leave the mine and then feed fold a section of leaf over, glue it down with silk and then feed on the enclosed inner surface. These cones are not really mines, but they are made by caterpillars that have finished mining (often on the same leaf). Cones may be small and at the leaf-tip of significantly larger (caution – leaves are also rolled by some beetles). Some species will pupate in the cone – others will leave it and pupate in a silk cocoon on the leaf surface.

If you are still confused by the concept of a leaf-mining moth, then visit www.leafmines.co.uk and get educated!

THE 2021 ASSAULT ON LEAF-MINING MOTHS

Our two counties of Hertfordshire and Middlesex are quite well-covered for most leaf mining moths – Herts better than Middx – but there are some enormous gaps for many species, even common/ubiquitous moths. In 2021 we are trying to fill these gaps.

You can take part – either by naming mines yourself or, if you lack experience/confidence, by collecting affected leaves and then posting them to me.

HOW TO FIND LEAF-MINES

Think empirically. Plants are "born" perfect. Nature sends out perfect leaves. So, all YOU have to do is look for a leaf that is not perfect. Easy-peasy. Then – just ask the simple question … "what caused the imperfection?

Sometimes this will be animal damage, feeding by various insects, fungal disease and many other causes, but if the leaf has signs of INTERNAL feeding then you have a leaf mine. Not necessarily caused by a moth – but you are on the road to finding out what caused the imperfection. **If in doubt, collect it and send it to me.**

WHICH PLANTS HAVE MINES?

The answer to that is "most"! Not all will be caused by moth larvae, but I still want to see these as I also have an interest in other groups.

The following is a very basic and far from incomplete guide to plants mined by moths to help your searches. Many other plants are mined by flies or other groups, but I am also keen to see these, please. Remember that there may be more than one mine of each type on each plant (e.g., Hazel has 2 tunnels and 3 puckers – all of which are widespread in Herts & Middx). Mines indicated by an asterisk (*) may be difficult to identify.

Plant	Miner types to find			
	Tunnels	blotches	Puckers	cones
Agrimony	√	√		
Alder	√*		√	√
Alder Buckthorn	√			
Apple (wild & domestic may have different species	√	√*	√	√
Ash		√		√
Aspen	√			
Azalea (*Rhododendron*)				√
Beech	√			
Bindweed	√			
Birch	√	√	√	√
Bird's-foot Trefoils	√	√		

Blackthorn	√	√	√*	
Bramble	√	√		
Broom	√			
Buckthorn	√			
Cinquefoil	√	√		
Colt's-foot	√			
Dyer's Greenweed	√		√	
Elm	√		2	
Fat-hen	√			
Enchanters Nightshade	√			
Field Maple Keys	√			√
Goose-foots	√			
Field Maple Leaf	√	√	√	√*
Firethorn (*Pyrracantha*)			√	
Grasses	√*			
Ground Ivy		√		
Hawthorn	√*	√	√	√
Hazel	√		√	√
Honeysuckle			√	
Hornbeam	√		√	√
Laburnum	√			
Lime	√	√		
Lupin (garden)	√			
Meadowsweet	√			
Mugwort		√		
Norway Maple Keys	√			
Norway Maple Leaf	√		√	
Oak (deciduous)	√*	√*	√*	√*
Oak (evergreen)	√	√		
Ox-eye Daisy	√			
Plum/Damson and other Prunus	√	√		
Poplars	√			√*
Privet		√		√
Red Clover		√		
Ribwort Plantain			√	
Rose	√	√	√	
Rosebay Willow-herb	√			
Rose of Sharron (*Hypericum*)	√	√		
Rowan	√	√	√	
Salad Burnet	√			
Sallow	√*		√*	√*
Self-heal	√			
Sorrel	√			
St John's Wort		√		
Strawberry (wild & domestic)	√	√		
Sweet Chestnut	√*			
Sycamore Keys	√			
Sycamore leaf	√		√	√
Tormentil	√	√		
Vetches	√	√		
Whitebeam			√	
White Clover		√		
Wild Service	√*		√	
Willow	√		√	√*
Willow-herbs (other than Rosebay)	√			

Wood Avens	√			
Yarrow	√			
Yellow Loosestrife		√		

HOW TO COLLECT LEAF-MINES

If you can name the species, this next bit is not for you – just send me the records. For the rest of you …

Don't name stuff in the field. **Collect and check.** If you are concerned not to cause damage, just tip unwanted leaves under a hedge somewhere – the larvae within will take no harm. Leaves sent to me will also usually be tipped out in this manner (unless retained for breeding adults).

Try to collect a small bunch of leaves on a short section of stem rather than just the individual leaf containing the mine.
Some tunnels may start or finish in the leaf stem and picking just the leaf means this cannot be seen.

Collect leaves into clear plastic bags and remember to label the bag (see below).

If the leaf is wet/damp GENTLY dry with a soft tissue and allow to air-dry for a minute (don't squash the caterpillar within, I may need it alive for correct identification).

Now, unless it is oak or something else blindingly obvious, write the plant name on the leaf with a **ball point pen**, taking care not to obscure any part of the mine with the label). Many plants will be obvious, but differences between apple, various species of *Prunus* and sallow, for example, can be hard to spot on a single leaf! If in doubt, please label it.

Now, before they dry out, put all the labelled leaves from a single site on a single date into a single plastic sandwich bag and add a paper label bearing:

- Place name;
- If known a 4-figure grid reference, but this is not essential if the place name is on the O.S. map;
- Collection date;
- Your name as collector.

Ideally use a pencil for the main label – survives condensation better than biro.

Now put this and any others in a padded envelope and post to me in the ordinary mail, making sure that if you want me to send you a list of what is there you have included a contact e-mail (or postal address). No contact details – no list!

Easy really!

Remember – even one mine is better than no mines (though you ought to be able to find several once the season gets under way). There are some map tetrads for which we don't even have a record of the common Bramble Leaf-miner yet! You can rectify this.

WE WANT RECORDS OF ALL LEAF-MINING SPECIES IN THE AUTUMN OF 2021. If in doubt, send it to me … it will only cost you a stamp!

The distribution maps of leaf-mining species have filled out significantly for Hertfordshire since we produced the Herts Moth Book in 2008. Middlesex is lagging behind a bit, but with some small effort we can improve this situation. Maps updated to the end of 2020 are accessible on our web site at www.hertsmothgroup.org.uk (these maps will not yet include 2021records, of course).

TARGET TETRADS FOR LEAF-MINER HUNTING SEPTEMBER – NOVEMBER 2021

Middlesex is generally covered rather poorly, so all records from all areas are wanted. Unsurprisingly, the somewhat more rural county of Hertfordshire has far better coverage. The north-east is very well-covered (guess

where I live!), but even here there are several blank tetrads (all of which I am intent on visiting in the next few weeks).

I still want all leaf mines (or lists) from **ALL** areas of Hertfordshire, but I have made a selection here of those map tetrads of Hertfordshire (VC20) with very few or zero records. This is not a complete list – it is a list of target tetrads spread across the whole county so that everyone should have a place to visit relatively near to them.

For Middlesex a target list is less valuable as there are a great many un-recorded areas.

Of course, not everyone has a car. If you can only walk to record, then start with your garden and work outwards to the neighbouring gardens, the local park/cemetery and so on. Cemeteries in particular may be productive as they may have a variety of ornamental plants

What is a map tetrad?

Tetrads are 2km x 2km map squares, defined by their south-west corner on the O.S. map. They are referred to numerically or alphanumerically. So, the bottom left tetrad of ten-kilometres map square TL42 is defined at TLT00 or TLA, depending on which system you prefer. That in the top right corner is TL42T88 or TL42Z.

If still unclear, look in in *Larger Moths of the London Area* (pages xiv & xv) and/or *The Moths of Hertfordshire*, page 45 – in both works there is a hopefully clear diagram/drawing. To buy a copy of the Herts Moth Book at rock-bottom price go to https://www.hertsmothgroup.org.uk/index.php.

Within the selected tetrad please visit sites and label samples in the usual way – just use the list below to get you to an unrecorded area of the map.

EVERY RECORD COUNTS. Many of these target map tetrads that still do not have a record for the ubiquitous bramble leaf-miner – yet most of us will be able to find this species easily wherever there are brambles.

TARGETS FOR 2021 LEAF-MINE SURVEY
10Km square TL00
tetrad 00T00 = 00A … which contains … Flaunden
tetrad 00T04 =00C… which contains … Hanging Wood, north of Bovingdon
tetrad 00T06 = 00D … which contains … eastern edge of Berkhamsted including Grand Union Canal
tetrad 00T22 =00G… which contains … Bulstrode
10Km square TL10
Tetrad 10T60 = 10Q… which contains …Radlett Golf Course
Tetrad 10T80 =10V… which contains …Shenley & Combe Wood
tetrad 10T62 =10R… which contains … Broad Colney & southern London Colney
tetrad 10T82 =10W… which contains … Bell Roundabout (M25 junction 22)
10Km square TL11
tetrad 11T66 =11T… which contains … Blackmore End
tetrad 11T68 =11U… which contains … Kimpton
tetrad11T86 =11Y… which contains … Ayot St Lawrence
tetrad 11T88 =11Z… which contains … southern bit of Hoo Park and along the Kimpton Road
10Km square TL21
tetrad 21T00 =21A… which contains … south of Lemsford & east of Symondshyde Great Wood
tetrad 21T02 =21B… which contains … Brocket Park
tetrad 21T04 =21C… which contains … Ayot St Peter
tetrad 21T06 =21D… which contains … south-west of Codicote
tetrad 21T08 =21E… which contains … Codicote
10Km square TL22
tetrad 22T46 =22N… which contains … northern Stevenage
tetrad 22T48 =22P… which contains … Damask Green; Howe Wood
tetrad 22T68 =22U… which contains … Weston Park & Warrens Green
tetrad 22T84 =22X… which contains … Bennington Lordship
tetrad 22T86 =22Y… which contains … north half of Walkern
tetrad 22T88 =22Z… which contains … Cromer, Luffenhall
10Km square TL32
tetrad 32T04 =32… which contains … Clay End & Bassus Green

10Km square TQ29
tetrad 29T06 =29D… which contains … eastern Borehamwood & Rowley Green
tetrad 29T08 =29E… which contains … Well End
tetrad 29T24 =29H… which contains … Arkley, Totteridge Park
tetrad 29T26 =29I… which contains … western Barnet (part in Middlesex)

When I say "**all**" I really do mean "**all**". Many species of fly, sawfly, beetle and some other groups may mine leaves; you don't need to be able to identify these, but please do collect them and get them to me for naming.

If in doubt, bag it up and get it to me.

RESOURCES

If you are not already aware, there is an excellent leaf-miner web site at www.leafmines.co.uk. A good way of naming many species is to go here then select "Plants" from the top bar and then the name of the plant that you have (it works on genus name – so "*Quercus*" not "oak" – you may need a cheap flower book or else look up the genus on Google). Once at the correct plant species, the moths and other beasts known to mine that plant are listed and you simply select each in turn and look at the (usually several) pictures.

POSSIBLE INSPIRATION?

I took a short walk down the western (Hertfordshire) side of the River Stort from the Sheering Lock towards Harlow on 11th September, only a couple of miles from my house. I was pleased to find mines of ***Lyonetia prunifoliella*** in leaves of Blackthorn (*Prunus spinosa*) This moth was thought to have become extinct many years ago, but in the last few years has reappeared. We have a couple of records of adults at Barnet, Herts (Rachel Terry) and Ealing, Middlesex (Barbara Mulligan), but this is the first evidence of breeding in our area. It is likely to be overlooked. The same short trip also produced ***Phyllonorycter pastorella*** mines in Crack Willow (*Salix fragilis*) leaves and ***Phyllonorycter comparella*** mines in leaves of White Willow (*Populus alba*). Both are rare in Herts, though *pastorella* is established in parts of Middlesex and may be spreading north up the river valleys. Three good moths in three-quarters of an hour … it IS worth going out to look!

TRAINING TRIPS

If there is enough support – and if there is petrol for travel – and if the weather is favourable – and probably various other provisos – I may run a training trip or two at a reasonably central location. If this would interest you please express that interest by e-mailing me.

Happy mothing,

Colin

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Colin W. Plant
Herts & Middlesex Counties Moth Recorder
14 West Road
Bishops Stortford
Hertfordshire
CM23 3QP

E-mail: Colinwplant@gmail.com
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