Identifying Those Tricky Little Micro-moths

Paul J. Palmer

What Is A Micro-moth?

- This is a tricky question to answer as there no taxonomic difference, as in butterflies and moths. Even that is a bit blurred.
- So far as I can tell, the larger moths are those that were described in South vols 1 and 2 "The Moths of the British Isles", and the rest are the micro-moths.
- In the olden days when we used a light trap there we so many large moths that we were never tempted by the micros that were trampled by the *Noctua pronuba* (Large Yellow Underwing) which came in their hundreds.
- Micros were collected by rearing out series collected off food plants and mines.
- The first (and current) editions of "The Field Guide To The Smaller Lepidoptera" contain no illustrations of adult moths at all.

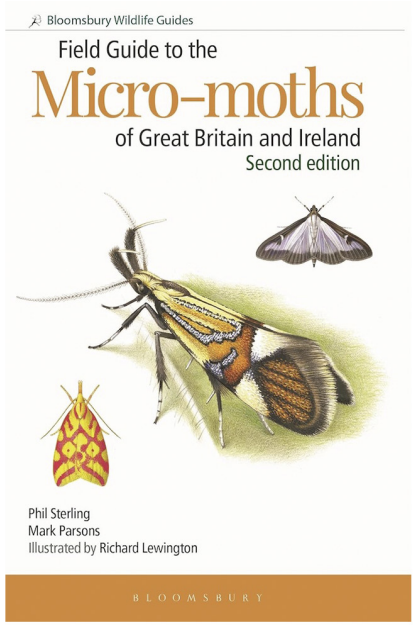
Wot! No Illustrations?

Don't worry, I will use them later in this presentation.

- Without illustrations the emphasis for identification rested on descriptions of the larval behaviour and food plants.
- Adults were set and pinned as a "series".
- Just to emphasise, you had to be really proficient with your plant identification too.
- My old copy of Clapham, Tutin, and Warburgh "The Excursion Flora Of The British Isle" was also without images.
- To those of you only used to modern illustrated field guides this must sound very strange, but the point I make is that a good identification is based on a collection of evidence, not a match to an image.

First Steps

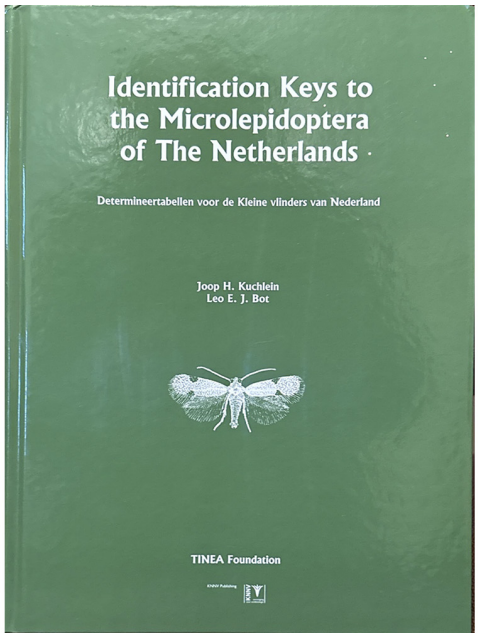
- Light traps catch fewer moths these days, so the micro-moths are more obvious.
- The publication of the excellent illustrated 'Field Guide to the Micro-Moths of Great Britain and Ireland' has helped popularise this group further.
- BUT, the temptation for beginners is to 'pattern match' from a field guide.
- The availability of 'Apps' reinforces this approach.



Field Guide to the Micro-moths

Identification Is A Process

- Treat ID as process and start by writing down everything that you know and can see.
- Examine your specimen closely.
- Use these notes to try and work out the Family.
- There is a good visual key to families in 'Field Guide to the Micro-Moths of Great Britain and Ireland'.
- Lepidoptera keys to species level are few and far between.



A key to the Micro-moths

A Tricky Moth For ID

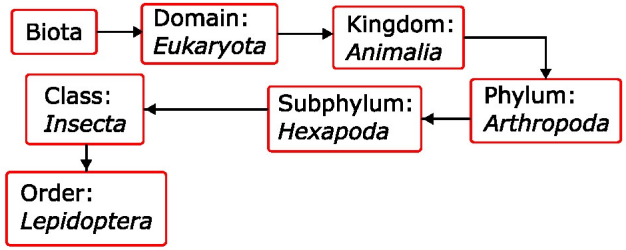
- Making a list of candidate species is a tedious and time-consuming process.
- You should now have a list that includes: size, locality and type of habitat; date; and other obvious features.
- A photograph is also helpful - look at the posture and position of the antennae.

What can we see here?

We will illustrate the ID process by following one moth tricky moth through its journey.

Checking The Basics

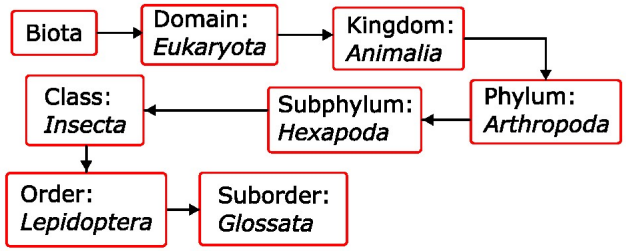
- First check that our specimen is a moth.
- This is not as daft as it sounds as it is not unheard of for a Caddis (Order: Trichoptera) to be queried as a moth.
- In this case the overall appearance is definitely Lepidoptera.



Tree of life (biology)

Checking External Features

- All the short jawed Lepidoptera are micro moths, so it is quite likely that you will come across them, especially those that might be tricky to ID.
- This specimen has a long coiled tongue, rather than short jaws, as have the majority of the Lepidoptera.
- The long coiled tongue means that this moth is a member of the **Glossata**.



Tree of life (biology)

Getting To The Family 1

- The face has a distinctive 'nose' and face. Also the antennae are laying flush along the body:
- This is a member of the **Pyraloidea** super-family.

Note the posture.

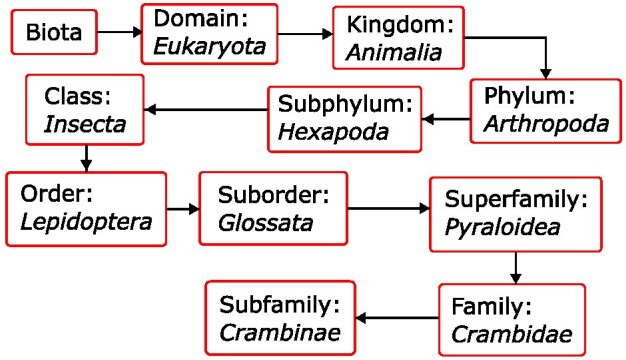
Getting To The Family 2

- The face has a distinctive ‘nose’ and face. Also the antennae are laying flush along the body:
- This is a member of the **Pyraloidea** super-family.
- The *Pyraloidea* are very variable but we can see that the long wings can wrap tightly around the body. Colloquially these are known as ’Grass moths, which are a member of the subfamily **Crambinae**.

Note the posture.

Getting To The Family 3

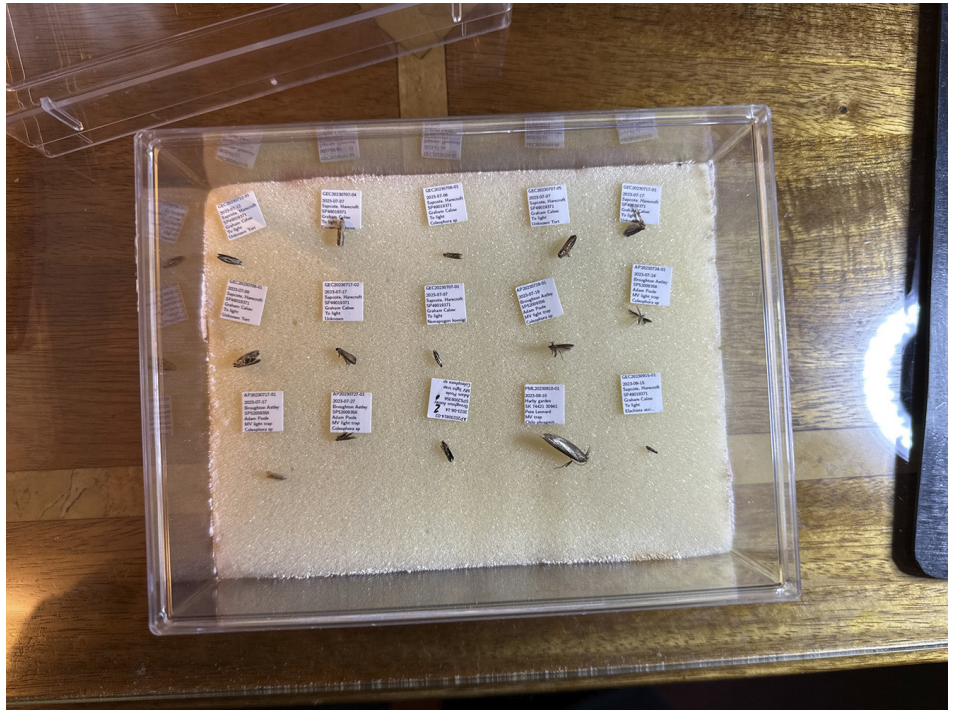
- The face has a distinctive 'nose' and face. Also the antennae are laying flush along the body:
- This is a member of the **Pyraloidea** super-family.
- The *Pyraloidea* are very variable but we can see that the long wings can wrap tightly around the body. Colloquially these are known as 'Grass moths, which are a member of the subfamily **Crambinae**.
- *We have reduced the number of candidate species to about 17.*



The Natural History Museum further subdivide this group into tribes, but these do not seem to be in general use.

Confirming the ID

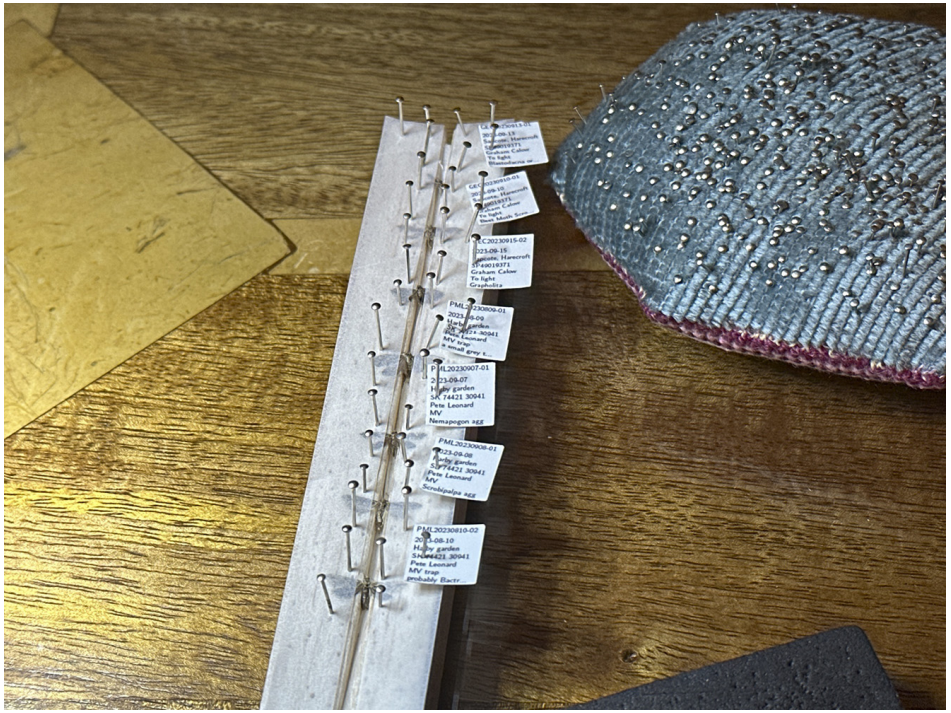
- We have gone as far as we can with external features.
- The way forward is examination of the genitalia - **GenDet**.
- We start by relaxing the dead moth



Relaxing chemicals are water based.

Setting

- The relaxed moth is pinned and spread on a setting board.
- Note how everything is carefully labelled.
- It is then dried for a couple of weeks.
- This process allows us to preserve as much of the specimen as possible.



A group of moths on the setting board.

The Set Specimen

- This specimen was fairly battered when it was received.
- Often the set moth reveals much more detail for ID, especially in obscurely marked moths.
- The wings still look very plain.

The set moth does not reveal any useful features for ID.

Clarification

- The abdomen is removed from the moth and 'cooked' for 30 minutes at 70 degrees in 10% KOH.
- A label is place in the tube using paper and ink that can survive this process.
- A body swap would be a disaster.

Equiment used for clarification

This process is loosely called *clarification* as it dissolves the soft tissues. Different authors use the term to describe rather different processes.

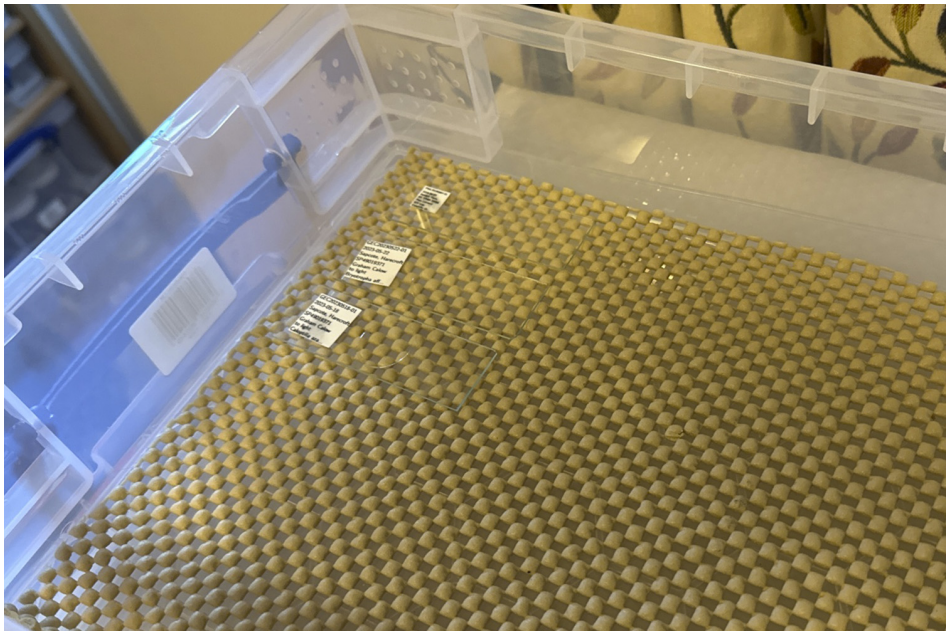
Dissecting

- The genitalia are very small so a range of bought and home-made tools are used to dissect out the parts needed.
- The parts are very fragile, so you only get one chance on a moth this size.
- No pressure when you are doing this for someone else!

The smaller the dissection the more important the work space.

Mounting The Dissection

- The parts are washed in de-ionised water.
- Soaked in a little aqueous mountant.
- Placed on a slide and a coverslip placed on top.
- Finally, a temporary label is glued to the slide.



Slides are left for a few days to cure.

Alcohol based mountants are more difficult to use.

Ringing The Slide

- Aqueous mountant slowly dries out, so needs to be sealed.
- A ring of sealant will make the slide last many years.
- A paintbrush is used to apply the sealant while the brass wheel is spun by hand.
- Acetone can be used to remove the seal if rework is required.

Good quality nail varnish works exceptionally well.

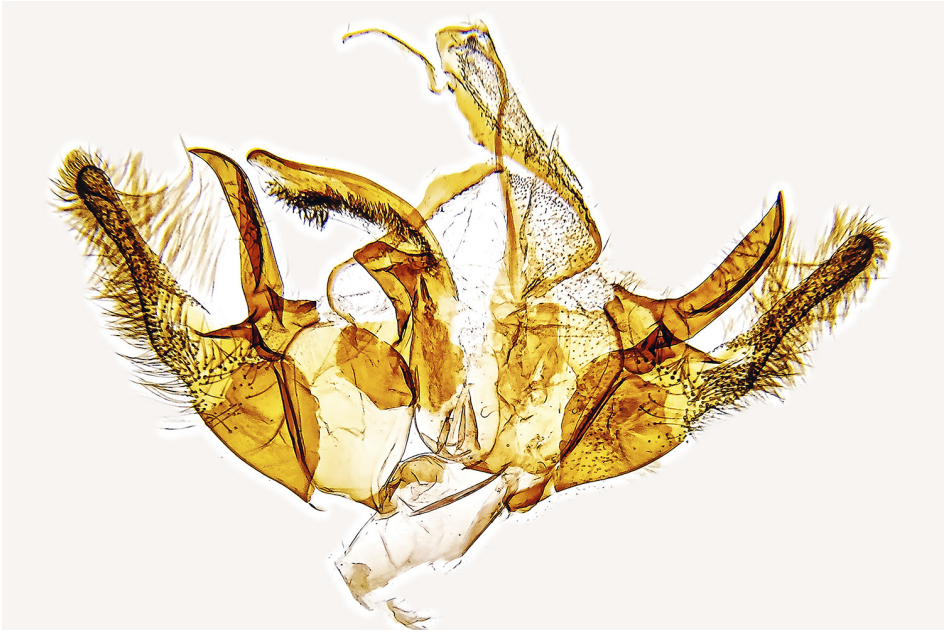
The Finished Dissection 1

- The finished dissection is never perfect.
- The final dissection image is more of an art form rather than a photograph.

Raw image

The Finished Dissection 2

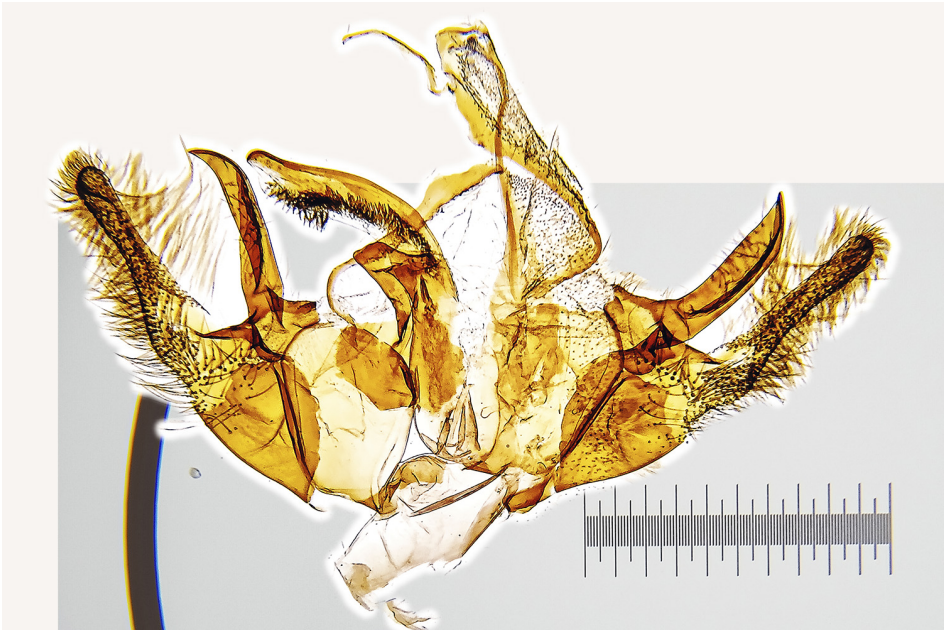
- The finished dissection is never perfect.
- The final dissection image is more of an art form rather than a photograph.
- An artist would eliminate the defects too, but don't obscure critical features.



Cleaned image.

The Finished Dissection 3

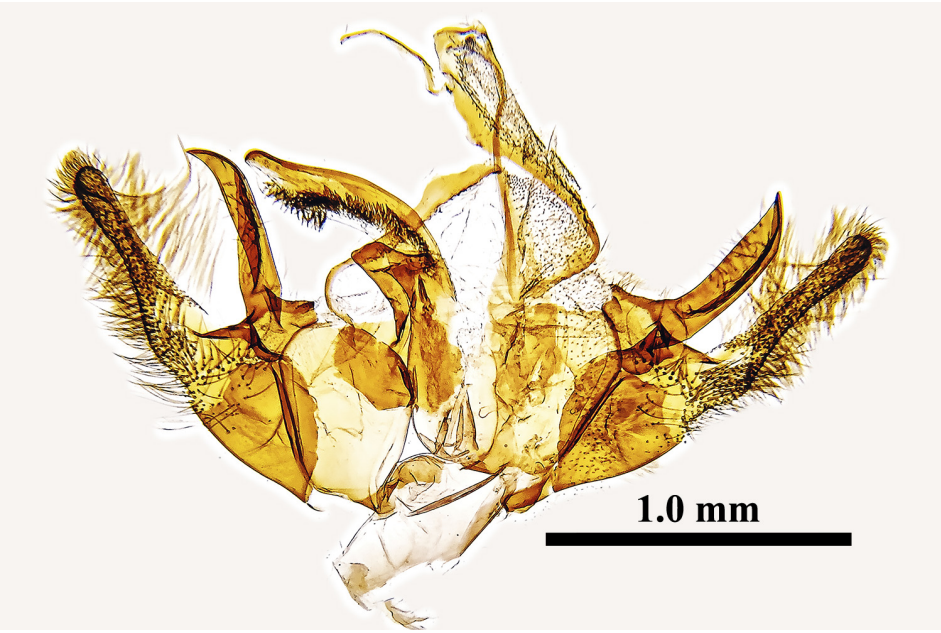
- The finished dissection is never perfect.
- The final dissection image is more of an art form rather than a photograph.
- An artist would eliminate the defects too, but don't obscure critical features.
- The scale is worked out by taking a photograph of a reference slide. . . ..



Adding a scale.

The Finished Dissection 4

- The finished dissection is never perfect.
- The final dissection image is more of an art form rather than a photograph.
- An artist would eliminate the defects too, but don't obscure critical features.
- The scale is worked out by taking a photograph of a reference slide. . . ..
- Overlaying the photographed scale allows us to draw a nice reference line.



The developed image.

Review Everything We Know About The Specimen

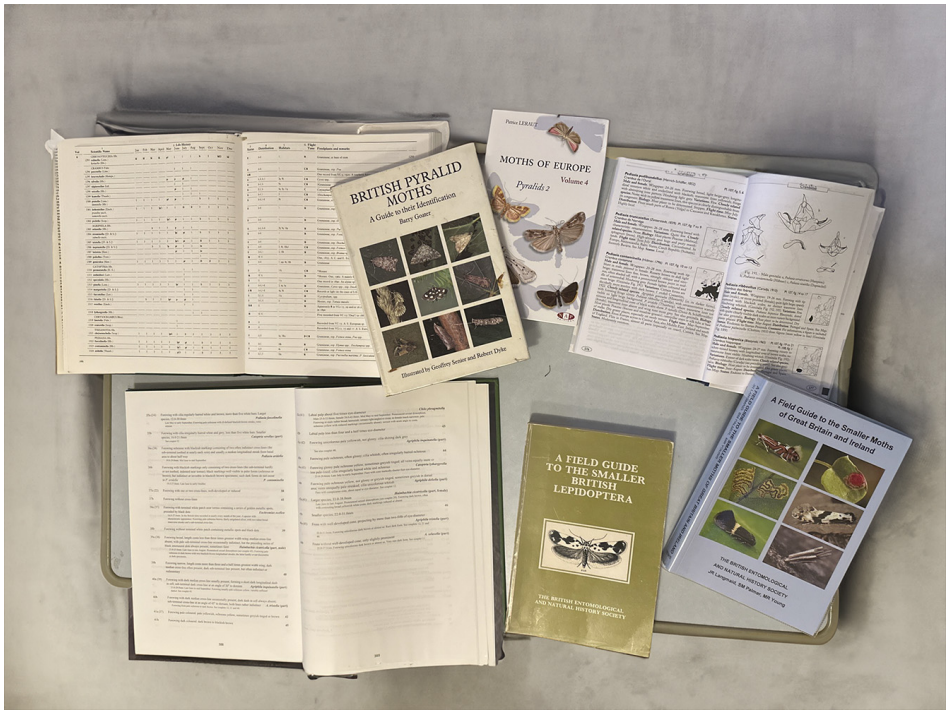
- Date: 2021-07-25, VC55; Recorder: Pete Leonard; Size: FL 12 mm.
- Could this be *Pediasia contaminella* which is rare in VC55?
- This specimen lacks the cross lines the dark point in the discal region typical of *Pediasia contaminella*.
- But *Pediasia contaminella* said to have a distinctive upwards resting posture.

The set moth does not reveal any useful features for ID.

Specimens seen in Sussex by PJP were all well marked and instantly recognisable in both posture and appearance.

Using The Dissection For ID

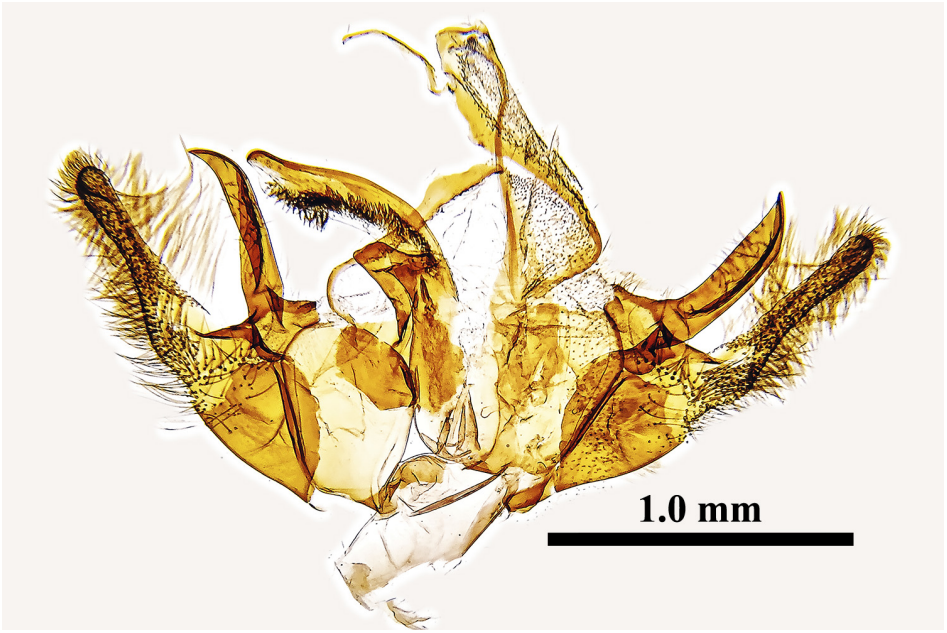
- Check the dissection against multiple sources as this specimen is not typical.
- https://mothdissection.co.uk
- https://lepiforum.org
- Ask someone who is familiar with the species.



Books often contain useful comments about variations.

Checking The ID

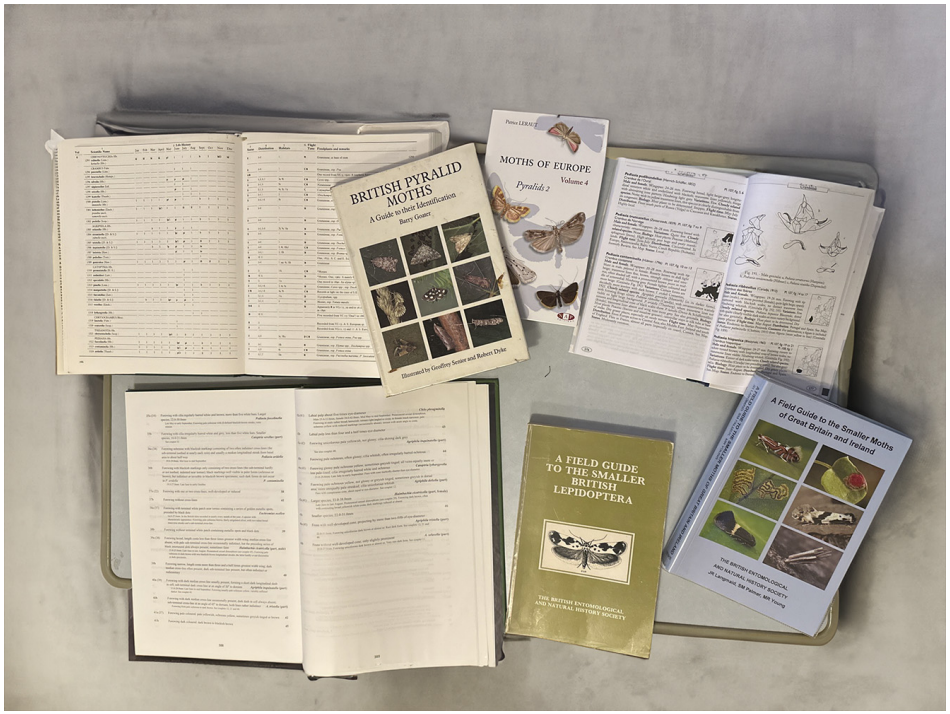
- The dissection matches *Pediasia contaminella* and is distinct from other members of the genus.
- We need to eliminate related species not on the UK list as the specimen is not typical.
- In this case we find no other candidates other than: *Pediasia contaminella.*



The horned processes and aedeagus are typical for *Pediasia contaminella.*

Summary

- Identification of a tricky specimen is a tedious process.
- Most of the time it turns out to be an unusual form of a common species as moths are very variable in size and wing pattern.
- Environmental stress can cause size and colour variations.
- Confirming the ID of something unusual requires the collation of a lot of evidence.



We still need to check books and published papers.

But sometimes you get lucky and it is a new record for the county!