



Anthomyiidae Recording Scheme

Newsletter No 14

Autumn 2023

Anthomyiidae Handbook Project

We have to report that work on this project has ceased. Our small Working Group made good progress in gathering information and producing a draft scope for a published Identification Handbook in the style of the RES series. This set a high bar if we were to emulate the recent volumes on Blowflies and Fungus Gnats in the series.

It had become apparent that the magnitude of the task exceeded that envisaged at the outset. This impression was reinforced when we visited the Oxford Museum of Natural History in February this year to view Michael Ackland's archive and collection. There is an impressive array of documents and papers and the specimen collection in the original boxes occupies several cabinets.



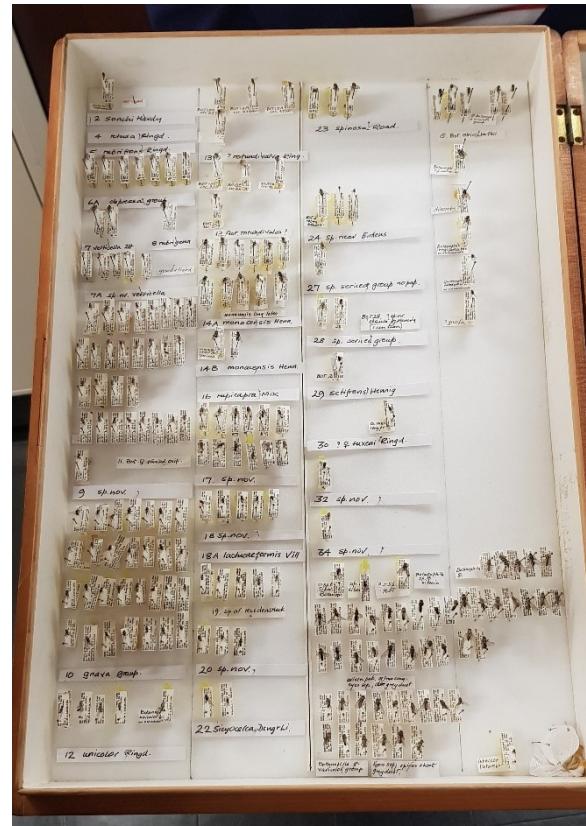
A peek inside one of these boxes containing part of the genus *Botanophila* showed several species marked as new to science. This of course reflects Michael's interest in the world-wide Anthomyiid fauna, and goes well beyond the scope of our British requirements. Nevertheless, we felt that a British handbook could not be produced without a good appreciation of the contents of the archive, not to mention frequent access to the collections to check details.

Given the size of the British Anthomyiidae family and the large range of ecological roles, this remains a large gap in the published literature, so it is to be hoped that

a project for an early-career entomologist to tackle this could sometime materialise at Oxford.

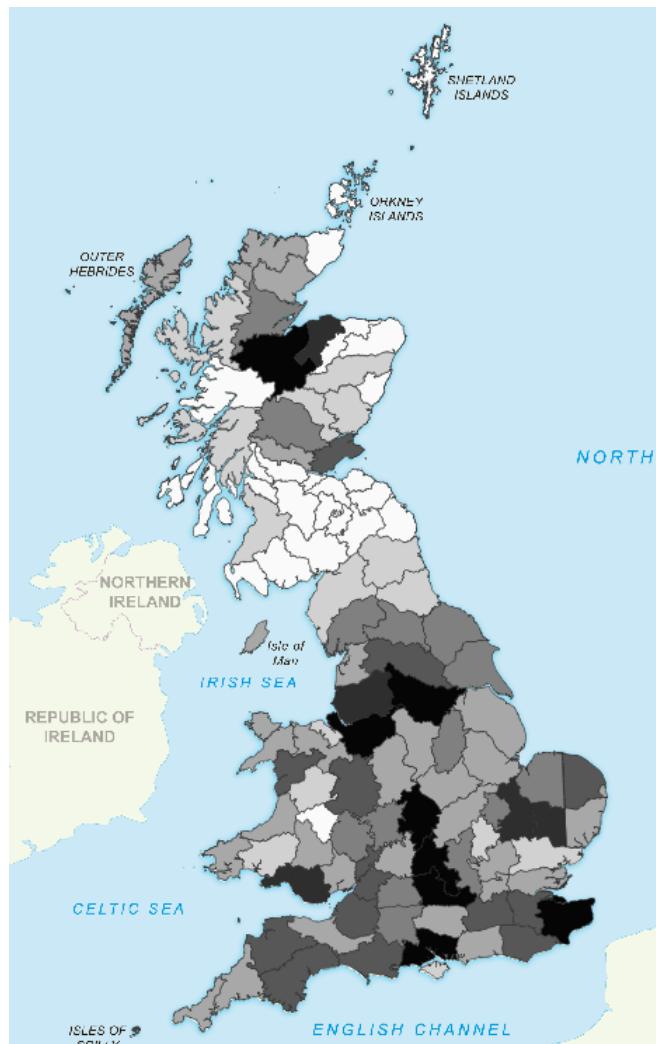
My thanks go to Steve Crellin, Gary Hedges, Siobhan Hillman, Steve Judd, Ali Shuttleworth and Sam Thomas for their help with the project, and the wider interest and encouragement shown by others. Thanks also to Zoe Simmons, Head of Life Collections at OUMNH for hosting our visit and to Gary for taking the pictures.

Michael Ackland always emphasised that the set of genitalia figures was the most important identification resource and that with experience people would usually go straight to those. We believe that the Workshop Notes remain adequate to support the Recording Scheme.

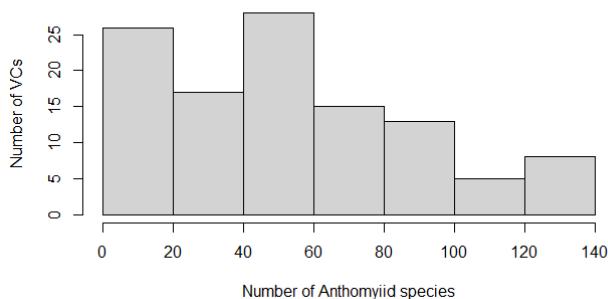


General distribution of Anthomyiidae

Part of our plan for the Handbook was an overview of recorded species distributions, perhaps along the lines of that in the Fungus Gnats handbook. There are now around 37,000 records on IRECORD, more than double the number at the end of 2019. Rather than plotting these numbers across the country, it is more revealing to look at the number of species recorded in each vice-county. This map shows the results on a scale from black for the highest to white for the lowest.



This histogram shows the numbers of vice-counties in each range.



The top ten of the 112 vice-counties are:

63	South-west Yorkshire	134
23	Oxfordshire	133
15	East Kent	130
22	Berkshire	129
38	Warwickshire	129
11	South Hampshire	126
58	Cheshire	123
96	East Inverness-shire	121
41	Glamorganshire	120
59	South Lancashire	120

These numbers show the influence of Michael Ackland's surveys in Oxfordshire and Berkshire. Laurence Clemons supplied his decades of records from Kent, and Warwickshire was covered by Steven Falk's data from the notebook transcription project. Numbers for the five Yorkshire vice-counties have been obtained from Andrew Grayson's list on the Yorkshire Naturalists website, and thanks are due to RECORD local records centre for the full Cheshire list. The last two of these sources are not yet fully reflected on IRECORD and NBN Atlas. Additional vice-county records for rare and scarce species have also been included from the status review of Falk and Pont (2017).

Putting the area of each vice-county into my species-area relation (Brighton 2023) gives expected species numbers for the top three vice-counties of 142, 132 and 137 respectively, an encouragingly close agreement. At the other end of the scale there is one VC with zero records – Selkirkshire in the generally poorly surveyed South of Scotland. Take a detour on your next trip to Scotland to get the first Anthomyiid record there!

Over in Ireland the number of species stands at 95, compared with the 93 listed by Chandler et al (2005). This compares with a species-area relationship prediction of 216, a considerably greater shortfall than for the “larger Diptera” overall.

Thanks to Gary Hedges for producing the map. Credit for the format should go to Rob Ryan (2019) whose British Heteroptera map shows a much greater bias to the south, albeit with 22 species recorded from Selkirkshire.

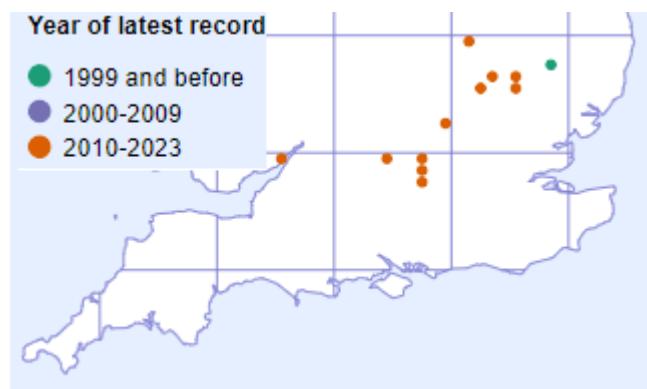
The *Anthomyia pluvialis* complex

I was very glad of the opportunity to talk to Ivan Perry at the Dipterists Day in London last November. He revealed that re-examination of his collection of the *pluvialis* section of the genus *Anthomyia* had uncovered two specimens of *A. plurinotata* from West Suffolk in

1997, over decade before our previous earliest British record (Brighton 2018). The side-pinning had obscured the distinctive pattern of two spots on the thoracic dorsum rather three in other British species (photos by Will George and Tim Cox):



This feature has produced a few more records from digital photographers on IRECORD in recently, whereas the much more frequent pictures of *procellaris* look-alikes have to be assigned to *Anthomyia* sp. (as in the delightful photo on the right by Graham Almond). There are now 17 records in an interesting swathe across Southern England.



Ivan had been re-examining his specimens because he had found two odd-looking *Anthomyia* males in his garden near Cambridge during last summer's heatwave. He identified them as *A. quinquemaculata* following Michelsen (1980a), who provided keys and descriptions for the males and females of the four similar species: *bazini*, *pluvialis*, *procellaris* and *quinquemaculata* (apart from female *bazini*). *A. quinquemaculata* has been recorded from around the Mediterranean, so it possibly arrived with the influx of hot air from the south.

Intriguingly, an unidentified *Anthomyia* species similar to *imbrida* is listed by Chandler et al (2005) from Northern Ireland. Genitalia drawings of this are included in the Anthomyiidae workshop handout.

The Anthomyiid sugar-beet leaf miners

Congratulations to Siobhan Hillman on completing her PhD about another troublesome species complex. Following damaging outbreaks of leaf-miners on the sugar-beet crop in 2015 and 2016, she was funded to study their population genetics and ecology at the

University of East Anglia (Hillman, 2022). Michelsen (1980b) described a complex of four *Pegomya* species: *betae*, *cunicularia*, *exilis* and *hyoscyami*. Siobhan has used DNA analyses to study a range of adult specimens from various collections and larvae, or the traces of larvae, from leaves collected from both cultivated and wild plants across a wide range of locations. Phylogenetic analysis was also used to look at the relation of the beet flies to a wider range of *Pegomya* species. She also developed a rearing technique and studied parasitoids and hyperparasitoids that emerged.

Overall a complex picture is presented with the possibility of cryptic species being involved.



References

- Brighton, P. 2018. A new first British record of *Anthomyia plurinotata* Brullé (Diptera, Anthomyiidae). *Dipterists Digest* (2nd Series) **25**, 145-146.
- Brighton, P. 2023. A provisional species-area relationship for the British Diptera. *Dipterists Digest* (2nd Series) **30**, 1-13.
- Chandler, P., O'Connor, J.P., Nash, R. & Ackland, M. 2005. The Irish Anthomyiidae (Diptera). *Dipterists Digest* (2nd Series) **12**, 107-127.
- Falk, S.J. and Pont, A.C. 2017. A provisional assessment of the status of Calypterate flies in the UK. *Natural England Commissioned Reports* **234**, 265pp.
- Hillman, S. 2022. *Population Genetics and Ecology of the Sugar Beet Leaf Miners*. Doctoral thesis, University of East Anglia. 212pp.
- Michelsen, V. 1980a. The *Anthomyia pluvialis* complex in Europe (Diptera, Anthomyiidae). *Systematic Entomology* **5**, 281-290.
- Michelsen, V. 1980b. A revision of the beet leaf-miner complex, *Pegomya hyoscyami* s. lat. (Diptera: Anthomyiidae). *Insect Systematics & Evolution* **11**, 297-309.
- Ryan, R. 2019. The general geographical distribution of the Hemiptera-Heteroptera in the British Isles. *British Journal of Entomology and Natural History* **32**, 47-50.

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