



Anthomyiidae Recording Scheme

Newsletter No 12

Spring 2020

By the time you read this in print, the collecting season for Anthomyiidae could once again be well under way. The previous Newsletter a year ago (see Bulletin No 86) highlighted three genera, *Egle*, *Chiastocheta* and *Leucophora* which are particularly suitable for targeted recording in the spring, so please look back at that issue if you are not already familiar with them. If you have good relations with local bee recorders, you might encourage them to look out for and catch *Leucophora* females lurking near the burrows of solitary bees. Noting the bee species on any such records would give added value.

This issue reviews the continuing growth of the Recording Scheme database as well as where to find data on Anthomyiidae from other sources. Another good genus for targeted recording later in the season is *Chirosia* with its twelve species currently recorded in Britain, all of whose larvae attack ferns. As with *Pegomya* leaf-miners discussed in Newsletter No 11, the feeding signs of some species are popular amongst recorders, but the association with particular species is not as clear-cut as previously suppose, as discussed in the final item.

Current State of Recording Database

The number of records credited to the Anthomyiidae Recording Scheme on the NBN Atlas was 17,374 in early December 2019. This is a 153% increase on the 6846 which were initially uploaded to IRECORD in autumn 2017. However, the number of Anthomyiidae records on the NBN Atlas amounted to 30,643, a factor 1.76 greater. If you type "Anthomyiidae" into the taxa search on the Atlas, you can reach a number of bar-charts showing the distribution of these records between data providers and vice-counties as well as their temporal distribution by decade and year since 1990. If you click on an individual bar you can get the details of the constituent records. The second biggest contributor to the NBN was the Welsh Invertebrate Database (WID) provided by Natural Resources Wales on 4869 records, followed by two local records centres, Rotherham on 1176 and South-East Wales on 1064. Amongst the vice-counties, East Kent is in the lead with 4432 records, with Glamorgan (1672) and South-West Yorkshire (1372) a distant second and third.

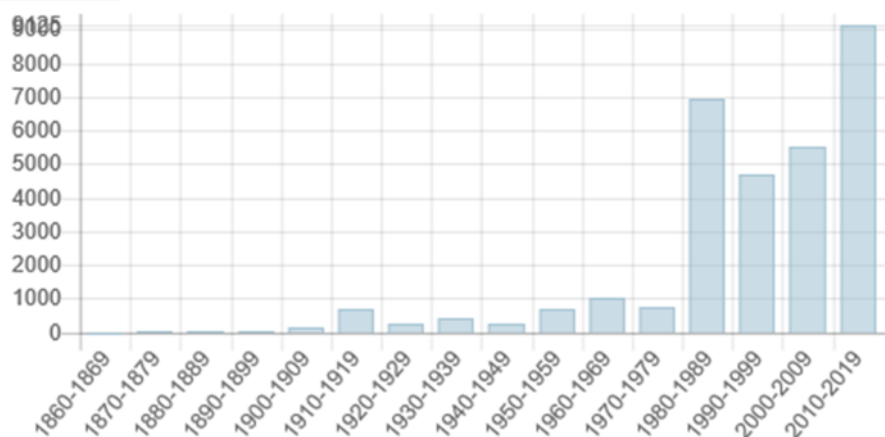
The charts by decade and by year since 1990 (reproduced overleaf) show a sharp increase from the 1980s largely sustained over the next 3 decades with a further boost in the last 3 or 4 years as the Recording Scheme was launched. That first rise must be associated with the start of the Study Group, for which Michael Ackland issued the first Newsletter in this series in December 1995. As yet, few spreadsheet records have been sent in for 2019.

The League Table

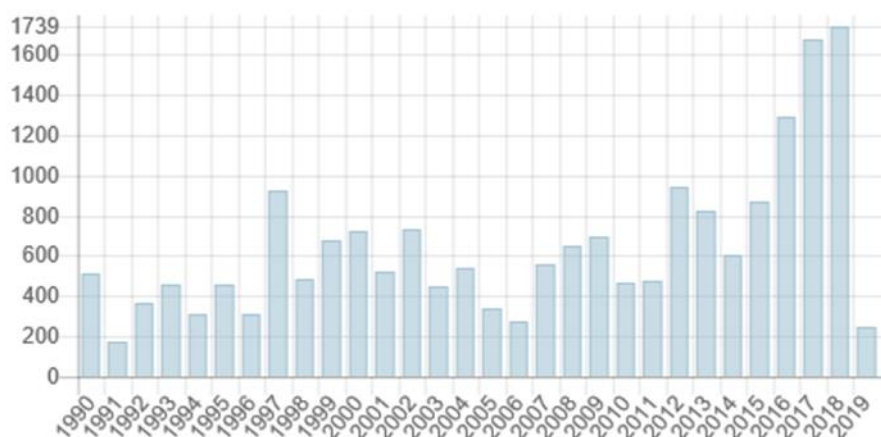
Despite this increase in on-line data, the coverage is still very patchy over the country. Distribution maps tend to show the distribution of dipterists rather than diptera. Aggregating the data over larger regions as in Newsletter No 10 provides a more balanced picture: to provide an update on that would require downloading all the individual records from NBN, not the work of a moment. For now, just the overall league table of the top 10 Anthomyiidae is presented on page 2.

NBN Anthomyiidae Records (accessed in early December 2019)

By decade



Since 1990



Anthomyiidae Recording Scheme League Table (Dec 2019)

Species	Total	Number of records in ARS at end 2019	Increase on end 2017	Number of records on NBN	Ratio of NBN to ARS number
<i>Delia platura</i>	316	1431	353%	2209	1.54
<i>Hylemya vagans</i>	260	1218	368%	1867	1.53
<i>Botanophila fugax</i>	224	962	329%	1309	1.36
<i>Pegoplata infirma</i>	248	737	197%	1540	2.09
<i>Pegoplata aestiva</i>	225	690	207%	2308	3.34
<i>Hylemya variata</i>	199	688	246%	1790	2.60
<i>Anthomyia liturata</i>	177	619	250%	855	1.38
<i>Anthomyia procellaris</i>	149	551	270%	691	1.25
<i>Delia florilega</i>	147	471	220%	1219	2.59
<i>Delia radicum</i>	118	378	220%	882	2.33

Despite the 153% increase in records, the top ten ranking shows only two changes. *Botanophila fugax* has gone up from 3rd to 5th place. *Hylemyza partita* has dropped out as a result of swapping places with *Delia radicum*, the cabbage-root fly. All of the top ten show a greater percentage

increase than the overall increase in records: they now provide 45% of the number of records, up from 30% previously. This is only to be expected as the initial data collection by Michael Ackland was oriented at defining the whole range of the British fauna, with much data from collections in which the numbers of the commonest species are inevitably limited by space.

Laurence Clemons has been recording Anthomyiidae over the length and breadth of Kent since 1982, and in an early report (*Entomologist's Record* **110**(1998)290-293) he found that his ten most frequent species constituted over 50% of his 1400 records of 100 species. Eight of his top ten species appear in the current ARS top ten. With continued recording up to last year, his tally had extended to 4088 records and 122 species. His top ten are now the same as those of the ARS dataset and constitute 58% of his total.

These data provide another excellent illustration of the effectiveness of the Fisher statistical theory of relative abundances described in the article "The Fifth Dimension" in the main body of Bulletin No 89. With $N=4088$ and $S=122$, α is found to be 23.65. For the 1998 figure of 1400 records, this predicts that 97 species would have been found compared to the actual 100. The number of singleton records has now reached 20 compared to a predicted 23.5. Doubling the number of records would be expected to yield a further 16 species.

I will make just two points about the total NBN figures in the League Table. First, the 10 species listed provide 48% of the total records, a slightly larger proportion than in the ARS database currently. Secondly, *Pegoplata aestiva* stands out as much better represented, toppling *Delia platura* from the No 1 position. The NBN bar-chart for the species shows that almost half the records come from Wales via the Welsh Invertebrate Data base (WID). The proportion of *P. aestiva* in the WID reaches 23.5% compared with only 4.0% in the ARS – an intriguing disparity.

Other data sources

The updated guide to the British Anthomyiidae produced for the Dipterists Forum Workshop in February 2018 contained a listing of all the species with the numbers of ARS records in 10 regions spanning the British Mainland. 90 of the 246 species were "starred" indicating that they were assigned a national scarcity or rarity designation in the Natural England status review of Calyptrates (NE Contract Report No. 234). If you do manage to collect a specimen of one of these species, you may want to consider a write-up for the *Dipterists Digest*. If so, you should be aware that even for these species, the coverage in the ARS database is not necessarily complete, as not all the data sources cited in NECR 234 are yet included: the report was based on information compiled from diverse sources over a period of 20 years or so up to 2012.

There are other significant stores of Anthomyiid records not yet available on the NBN.

The incidence of diptera species in the five vice-counties within the historic boundaries of Yorkshire is given in a checklist which can be found on the website of Yorkshire Naturalists Union. This currently lists 167 Anthomyiidae species compared to the mere 74 in the region of 11 vice-counties including Yorkshire, as listed in Newsletter no 10. Thus Yorkshire becomes one of the three best-recorded regions alongside south-east England and the Scottish Highlands, as far as number of species is concerned. You can contact Andrew Grayson (andrewgrayson1962@live.co.uk) for further details.

There may also be data worth having in your local records centre if there is a history of active dipterising. For instance, I noted back in 2014 (Bulletin No 77) that the Cheshire LRC contained 2375 Anthomyiid records, among over 50,000 non-syrphid diptera records. These have yet to be verified and published via the NBN, but there is an online facility which reveals the status of individual species (<http://www.record-lrc.co.uk/SpeciesSearch/Searching.aspx>).

Finally a comprehensive inventory of the diptera of the Western Isles of Scotland was one of the last publications of the late Peter Skidmore in *Dipterists Digest* **15** (2008) 99-194: this article provides full listings of locations and dates cross-referenced to the species list. The Outer Hebrides Biological

Recording Group (www.ohbr.org.uk) would like to make this data accessible online, but the transcription would be a big job and help may be needed, as indeed is true of the other treasure troves mentioned above.

I would be glad to learn of any other local data sources that you may know of.

New names now available on the UK Species Index

Newsletter 10 mentioned a problem with some species lacking a home in the UK Species Index (UKSI) which defines the taxon names that available in both IRECORD and the NBN Atlas. This arose from species new to Britain and other nomenclature changes in recent years. This has now been resolved, and the data for the species affected have been successfully loaded on IRECORD, and should appear on the NBN Atlas after the next regular transfer of data.

Two of the commoner species were affected. *Pegoplatia juvenilis* (Schnabl in Schnabl & Dziedzicki, 1911) subsp. *nitidicauda* is now again a species in its own right: *P. annulata* (Pandellé, 1899). This is a larger species with plumose antenna, so you might easily be misled as to its genus if you are used to getting lots of *P. infirma* (as most of us do). *P. juvenilis* is a North American species.

The restoration of *Botanophila discreta* (Meigen, 1826) as a species distinct from *B. striolata* (Fallén, 1824) – see Newsletter No 11 - has caused some complications. As the latter name was already on the UKSI, all existing records were transferred to a new “taxon concept” *B. striolata/discreta* agg. of which *B. striolata* and *B. discreta* remain synonyms. To record a definite decision between the two species the name needs to be entered on a spreadsheet as “*B. striolata* s.str.” or “*B. discreta* s.str.” (without a space in “s.str.”). All 5 options appear on the drop-down lists in IRECORD.

Recording fern-fly signs

The 12 British species of *Chirosia* are one of the more distinctive Anthomyiidae genera, because of a strong posteroventral seta on the hind tibia and usually a blackish appearance, sometimes rather shiny. They all breed in ferns and sweeping these in woods or expanses of bracken usually yields adults in spring and early summer.

When I embarked on the verification of Anthomyiidae data in IRECORD, I discovered that three *Chirosia* species have been the object of interest from recorders of galls and leaf-mines. Two of these are on bracken (*Pteridium aquilinum*): *Chirosia grossicauda* Strobl, 1899 is held responsible for galls in which the frond-tip is rolled over with a white larva (Redfern *et al.* (2002), p397); while *Chirosia histicina* (Rondani, 1866) is associated with the mining out of the tip of a frond, as seen in these typical photographs posted on IRECORD.



Chirosia betuleti (Ringdahl, 1935) is stated by Redfern *et al.* (2002, p. 288) to cause characteristic galls on other types of fern, such as lady-ferns (*Athyrium*) and male-ferns (*Dryopteris*). The tips of the frond are “rolled upwards into a loose, conspicuous mop-head involving many pinnae; inside a white maggot mines along [the] rachis causing it to coil”. I can confirm from experience that these are very noticeable in the field once you are sensitised to them. As far as the fern identification is concerned you need only to be able to distinguish bracken from the others.



Ackland and Bratton (2013) cast doubt on this specific attribution on the basis of the capture of one adult male of *Chirosia similata* (Tiensuu, 1939) around this type of gall. The patch of ferns had been seen developing the galls in previous years, but efforts to rear the larvae failed. In 2010, this was a first record of the fly for Wales, but 2 more have been recorded, on Anglesey and in Merionethshire, by Andrew and Janet Graham.

I can also report here for the first time the only record of *C. similata* from Scotland. I caught a male in the vicinity of some “betuleti” galls at the foot of Ben Ledi, during the Dipterists Forum 2019 summer field meeting. The galls were widespread in the area though that was the only adult fly I found of either alleged gall-former.

Michael Ackland recently sent me the article on *C. flavipennis* (Fallén, 1824) by the late Graham Griffiths in the catalogue of the Nearctic Diptera in connection with an identification query. The yellow wings and plumose aristae of this species (unusual as the hairs are not confined to a plane) make this species particularly distinctive. Griffiths reported the breeding of five males from leaf-mines similar to those of *C. histricina*. They came from bracken fronds collected in Surrey in late September. After the first winter only braconid parasites emerged and Griffiths had to wait until May of the following year for the flies themselves. Griffiths stated that the late date of the larval feeding accounted for an older claim in the literature that *C. histricina* was bivoltine.

Both of these associations would be additions to the otherwise very comprehensive account of *Chirosia* species on the UK fly-mines and European plant parasite websites (www.ukflymines.co.uk and <https://bladmineerders.nl>). Both these websites are extensively illustrated with pictures of larvae as well as of the leaf-mines, and contain very lengthy reference lists. The other *Chirosia* species are associated with mines further down the stems of fern, though there are also suggestions that *C. cinerosa* (Zetterstedt, 1845) can form *histricina*-type mines.

Do not let these uncertainties in attribution deter you from recording these galls and leaf-mines. *C. grossicauda* remains unchallenged as responsible for rolled leaf-tip galls. *C. betuleti* should still be used for the “mop-head” galls. However, we have asked leaf-mine recorders to use simply the genus name *Chirosia* for the leaf-mines formerly attributed solely to *C. histricina*. In IRECORD, the “Stage” field should be set to “pre-adult” or “other” according to whether a larva was present or not. The “Comments” field should be used to indicate the type of gall observed and the host plant, at least whether bracken or another fern.

Although the maps displayed on the NBN Atlas do not take account of the life-stage, inclusion of these fields will enable the gall and leaf-mine records in down-loaded data to be separated from those for the adult flies to look for correlations in distribution and phenology. If you catch the relevant flies in the vicinity of these galls or leaf-mines, just note that in the comments of a record with the Stage field set to “adult”.

References

- Ackland, D. M. & Bratton, J. H. 2013. Some new records of Anthomyiidae (Diptera) from Scotland and Wales, and a summary of *Chirosia* host ferns. *Dipterists Digest* **20**, 153-155.
- Redfern, M., Shirley, P. & Bloxham, M. 2002. British plant galls: identification of galls on plants and fungi. *Field Studies* **10**, 207-531.

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