



# Anthomyiidae Recording Scheme

Newsletter No 11

Spring 2019

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## Introduction

By the time you read this, the collecting season for Anthomyiidae could be well under way. This edition includes three items held over from the Autumn 2018 edition so that they have become more topical again. They concern genera which are particularly suited to a targeted search because of specific plant or host associations. Records and reports from later in 2018 are only just starting to trickle in, so the rest of the newsletter covers some identification issues that have arisen from the February 2018 workshop and from the verification backlog on IRECORD.

### An *Egle* bonanza

There are currently 12 species of *Egle* on the British list. All except one of these are associated with willow (*Salix* sp.). They are medium to small dark Anthomyiids but the genus is reasonably easy to identify from the protruding edge of the mouth and long proboscis in most species, an adaptation to flower-feeding. The eggs are also laid on the female catkins where the larvae feed in the developing seed and eventually drop to the ground to pupate until the cycle recommences in the following spring.

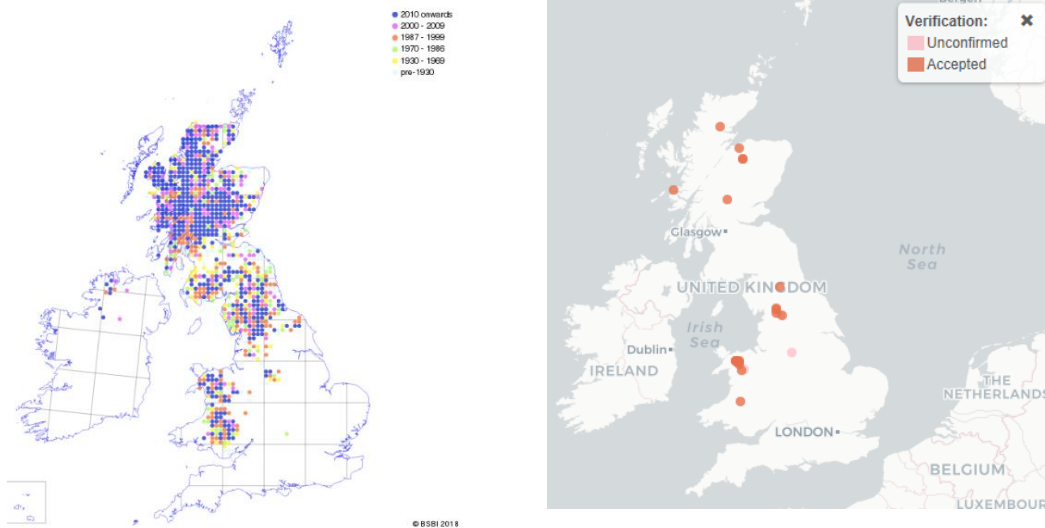
So these are a good subject for a targeted search early in the season when the adults can be swept from willows and can also be found basking in the sun on wooden structures. In a paper submitted for the next *Dipterists Digest* Nigel Jones says that for him “a good day *Egle* hunting heralds the beginning of a new season for Diptera and is something looked forward to with great anticipation”. Normally he captures a few specimens of one or two species, but 9 April 2018 at Venus Pool in Shropshire (SJ5406) was very different with a tally of 60 specimens and 8 species. Investigation of the recording scheme database shows this to be a record for a single site in a single day, though similar assemblages have been found over a period of time in small areas around Oxford and in South Yorkshire. Given these widely separated locations, it seems likely that a similar range of species could be found anywhere in the lowlands with willows in the right weather conditions. Nigel’s article contains some useful tips on collection and identification of the genus.

I had some success myself with a targeted *Egle* search on the dune slacks at Birkdale Green Beach (SD3013) on 15 April 2018. *Egle brevicornis* is a nationally scarce species particularly associated with creeping willow (*Salix repens*) on coastal dune systems. It is relatively large for *Egle* and similar to the common *E. ciliata*, but distinguished from it by the stiletto-like process on the cercal plate and a generally less hairy overall appearance. My *Egle* hunt yielded a total of 22 specimens with 11 *E. brevicornis* and three other common species. *E. brevicornis* has not previously been recorded in Britain north of Anglesey according to the NBN Atlas.

### A *Chiastocheta* quest

One of the particularly intriguing Anthomyiid genera is *Chiastocheta*. There are seven European species of five have been recorded in the UK, and like most of the *Egle* species they all both pollinate and feed on a specific plant – in this case *Trollius europaeus*, the globe-flower. Indeed it has been suggested that the form of these flowers has evolved to shelter the adult flies.

*Trollius* is an upland plant of damp pastures, which is declining in Britain and elsewhere in Europe (Suchan *et al.*, 2015). The maps show the BSBI's time-layered records of the plant and the distribution of the 54 records of genus *Chiastocheta* from the NBN Atlas. The North of England records are almost all the 1930s, when *C. trollii* could be collected in great numbers wherever the flower was found (Cheetham, 1933).



This certainly seemed a high priority for a new search. The Lancashire Environment Records Network (LERN) kindly gave me details of modern records of *Trollius*, from which the most accessible location seemed to be Standridge Pasture SSSI in the Forest of Bowland near Slaidburn (SD7353). Rob Zloch and I met there on 6 June: it took a while to locate the flowers on the lower parts of the north-facing slope, as they were already fading, with many reduced to seedheads. It seemed we might be too late, but we spent a couple of hours sweeping for any small black bristly flies we could find. Indeed my catch proved to contain no *Chiastocheta*, but Rob did get a few females – unfortunately these are not identifiable to species. Remembering a comment of Suchan *et al* about how the presence of the flies had been detected, I photographed a seedhead with possible fly eggs attached: Tomasz Suchan kindly confirmed these were indeed eggs of *Chiastocheta*.

We hope to return to the site in mid-May 2019 in the hope of finding some males and thus determining which species are present. Sarah Robinson of Lancashire County Council has told us that two new globeflower populations have been established from Standridge seed, giving scope for investigating the dispersal capability of these flies. We thank her and David Earl of LERN for their help.

#### [A swarm of \*Leucophora\*](#)

The eight British species of *Leucophora* are all associated with the nests of hymenoptera as kleptoparasites. Several of my records have been of individual females of *Leucophora obtusa* loitering on the ground near mining bee nests early in the spring, and males have been rather infrequent. In 2016, Nigel Jones had a rather different experience – he writes as follows:

“On 15 April 2016, at Preston Montford Field Studies Centre, Shropshire, I was assisting with identification for an Open University school on pollinators. The weather was overcast and cool, not rising above 7 degrees Celsius all day: not by any means ideal for finding pollinators, but the school

was limited to two days, so we had to try and find pollinators. Forced out in conditions under which I would normally never try to find flying insects, I searched around, and it was not long before I found some *Leucophora obtusa* males resting on stems and flower-heads of Teasel (Fig. 1). The more I



searched, the more and more *Leucophora* I found. I collected several specimens for identification and they were all *L. obtusa*. There were probably over 100 specimens, all mostly roosting on teasel, but also a few on other upright stiff-stemmed dead plants. This was in a small area about ten metres long by a few metres wide. Nearby was some open ground, known to host nests of mining bees, doubtless the place of origination for the flies, which are well known kleptoparasites of solitary bees. Interestingly, although the flies appeared to be moribund in the cold conditions, but they often flew off when disturbed by close approach, demonstrating that they are capable of flying, without warming sunshine, at temperatures as low as 7 degrees Celsius.

“I hypothesise that these males had all emerged very recently. Males of many insects often emerge up to a few weeks before females of the same species, probably to ensure that females, on their emergence, can mate quickly. On this occasion females had probably not yet emerged and the males were left ‘time stranded’, awaiting the emergence of females once conditions became favourable again. A few days later when conditions were a little warmer, the roosting males appeared to be no longer present.”

#### [The \*Botanophila discreta/striolata\* split \(or resplit\)](#)

Further to this issue raised in Newsletter 10, Chris Raper, as manager of the UK Species Inventory at the Natural History Museum, has now included the term *Botanophila discreta/striolata* agg. for records which cannot confidently be assigned to one or the other species. This will apply to older records where the determiner has not responded to a query in IRECORD or a specimen is not readily available for checking. Some recorders have reported specimens which seem to be intermediate when assessed against all the characters detailed in *Dipterists Digest* Vol. 20(2) p 153 and in the 2018 DF Workshop hand-out, so these can also be recorded as the aggregate – comments on the reasons for this will be helpful. I have specimens of both species from Michael Ackland and these photos show the difference in the width of the upper frons.

*Botanophila discreta* Meigen 1826

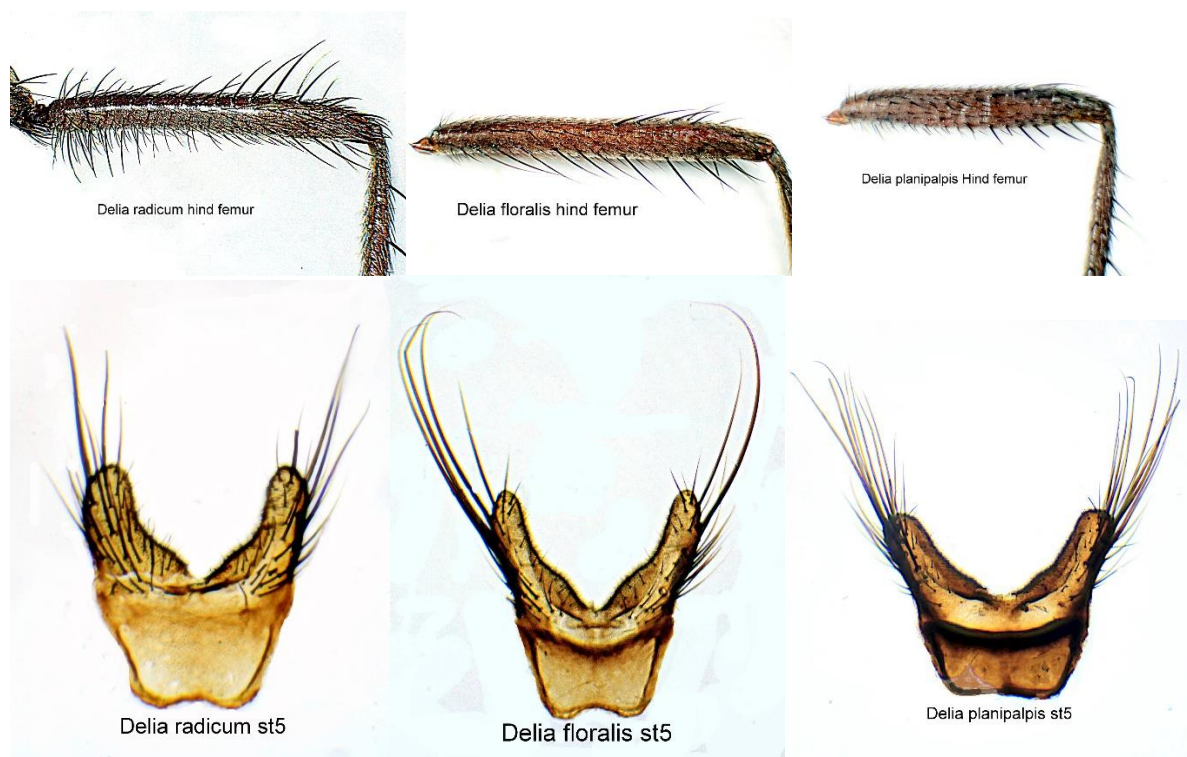
*Botanophila striolata* Fallén, 1824



### Cabbage root-fly identification problems

We have three rather similar species of *Delia* which attack the roots of plants in the cabbage family (Brassicaceae, formerly Cruciferae): *Delia radicum* (Linnaeus, 1758); *D. floralis* (Fallén, 1824); and *D. planipalpis* (Stein, 1898). The first of these is known to gardeners as the cabbage-root fly and was placed 12<sup>th</sup> in the league table of the commonest Anthomyiidae in the last Newsletter, with 118 records on the recording scheme database. The numbers of records for the other two were in single figures.

Michael Ackland's key distinguishes *radicum* from the other two by the presence of a "dense brush" of ventral setulose hairs at the base of the hind femur on the av, v and pv surfaces. It became apparent in the recent DF Workshop that participants were doubtful about this feature, and I also received some records of the other two species from seasoned recorders, which on further consideration were renamed as *radicum*. Michael has provided some comparative photographs to augment the descriptions in the key of the hairs and bristles on the hind femora and of sternite V. In specimens of *radicum* that I have seen there has been some variation in the density of the hairs on the base of the femora but it has always been quite different from the short ciliation, with or without bristles, of the other two species.



### Leaf-mining *Pegomya* species

*Pegomya* is our largest Anthomyiid genus, with 48 species on the British checklist, though only *P. bicolor* appears in the top twenty by number of records on the recording scheme database: it is at 14<sup>th</sup> place with 104 records. When I started the verification of Anthomyiidae on IRECORD, I found that recording of this and a few other species on the basis of leaf-mines has been quite popular, dominating the numbers of records from adult specimens. This is of course the mainstay of the Agromyzidae Recording Scheme recently started very successfully by Barry Warrington (see Newsletter in the Spring 2018 DF Bulletin). Many can be identified from the leaf-mine alone, while others may require examination of the larva or puparium, or breeding out of the adult. While there is a classic 1957 book in German by Hering, it is likely that most recorders will have used the on-line resources at <http://ukflymines.co.uk/> or at <http://www.leafmines.co.uk/>, which covers non-diptera as well. These sources also cover the Anthomyiid leaf-miners.



Given the relative paucity of adult *Pegomya* records, leaf-mines are potentially a valuable source of extra data on distribution and phenology. Unfortunately the most frequent host plants, the docks and sorrels (*Rumex*, family Polygonaceae) are attacked by four species *P. bicolor*, *P. haemorrhoum*, *P. solennis* and *P. vanduzeei* and there seems to be no clear way of distinguishing the resulting blotch leaf-mines (see left).

The beet flies attack members of the Chenopodiaceae family which includes goosefoots (*Chenopodium*), oraches (*Atriplex*) and the common beet (*Beta vulgaris*), which has many forms including wild sea beet, garden beetroot and chard and agricultural sugar beet and mangolds. They are regarded as a significant agricultural pest. Dipterists Forum member Siobhan Hillman is currently engaged in a PhD on this subject at the University of East Anglia and writes as follows:

“The sugar beet leaf miners have a complicated taxonomic history, with little known about their biology and ecology. Past literature often refers to the sugar beet leaf miner as a single species, or a complex of two species (*Pegomya hyoscyami* and *P. betae*), but the most reliable and up to date research of the sugar beet leaf miner complex refers to them as a complex of four species; *P. hyoscyami*, *P. betae*, *P. cunicularia* and *P. exilis* (Michelsen, 1980). There are relatively few records of these species from the UK despite these leaf miners being sporadic pests of sugar beet. This is most likely due to the fact Anthomyiids are a challenging group to identify from morphological features and very little is known about these species.

“As part of my PhD we are aiming to identify the exact number of species within this leaf-mining complex, with reference to the morphological features and comparative DNA analyses between any potential species. We will also be investigating life history traits and the effect these leaf-miners have on their host plants. Within the UK there is little information on the exact distribution range of these *Pegomya* species which may be due to the fact that the host plant range of these leaf miners is currently undetermined, as there are relatively poor historic records of host plant species associated with them. We will therefore be investigating the host plant association of these leaf miners, as well



as the current distribution of these species within the UK. Additionally to this, we will be identifying any associated parasitoids associated with these Anthomyiid flies, and how they might vary between regions and between species.”

Siobhan has asked for material for this analysis from across the UK. I thought I had struck gold when I saw these leaf mines in a goosefoot-like plant on Birkdale beach (SD2913) on 31 May this year and swept large numbers of a bristly grey and orange fly; but they turned out to be the Sciomyzid *Pherbellia dubia*!

Siobhan is also interested in the entire genus and so samples of any *Pegomya* species would be much appreciated: please contact her at [Siobhan.Hillman@uea.ac.uk](mailto:Siobhan.Hillman@uea.ac.uk)

I am asking recorders of leaf-mines in the dock and beet plant groups to put them on IRECORD simply as *Pegomya* with details of the host plant, and the life stage specified as “other” so that they can be filtered out and analysed in due course.

There are a few other *Pegomya* species which have been recorded to species from leaf-mines: on burdocks (*Arctium* sp.) there is a single *Pegomya* leaf-miner, *P. laticornis* and the mines are readily distinguished from those of other diptera and non-diptera; the same situation prevails with thistles (*Cirsium* sp.) and *P. steini*, but caution is required as the Agromyzids *Phytomyza cirsii* and *Ph. autumnalis/spinaciae* can cause similar mines, especially if rather compacted; finally, the leaf-mines of *P. flavifrons* on the Caryophyllaceae such asampions and chickweeds are not clearly differentiated from those of the Agromyzid *Amauromyza flavifrons*, but the families can be

separated by examination of the larval mouthparts. Also the larva of *P. flavifrons* is distinguished by the strange habit of retaining the frass within its body.

I am indebted to Barry Warrington, Julian Small and Rob Edmunds for their advice on identification from leaf-mines and the associated larvae.

...and finally, a remarkable coincidence

In May, Andrew Graham sent me an e-mail about a recent find of two scarce Anthomyiids: *Botanophila sanctimarci* and *Pegomya rugulosa*. These were both first records for Wales (SJ25, VC50) of these nationally scarce species. *B. sanctimarci* is strongly associated with wild garlic, and so another good subject for a targeted search in late April or early May.

A day or two later, I was astounded to find *Pegomya rugulosa* myself in a batch of specimens from a wooded clough on the Smithills estate (SD61, VC59), the extensive upland area near Bolton recently taken over by the Woodland Trust. While *B. sanctimarci* is a southern species, *P. rugulosa* is a predominantly Scottish one with only a few previous English records. It is a robust fly with distinctive processes on the male sternite V, as seen in the photos below. It belongs to the *Pegomya* subgenus *Phoraea* which is associated with fungi. We can only speculate that this was a particularly good year for a species which has previously largely escaped detection south of the border: the Scottish records are mainly from late May to mid-June, so a southwards migration seems unlikely.



These photos are both from Janet Graham's flickr site

<https://www.flickr.com/photos/149164524@N06/28125466068/in/photostream/>

where many other wonderful pictures of diptera and other insects are to be found.

### References

Cheetham, C. A. 1933, *Triogma sulcata* Schum. and other Yorkshire diptera, *The Naturalist*, July 1: 156.

Michelsen, V. 1980, A revision of the beet leaf-miner complex, *Pegomya hyoscyami* s. lat. (Diptera: Anthomyiidae), *Entomologica Scandinavica*, 11: 297-309.

Suchan, T. et al 2015, Asymmetrical nature of the Trollius–Chiastocheta interaction: insights into the evolution of nursery pollination systems, *Ecology and Evolution*, 5(21): 4766–4777.

**Phil Brighton**