Anthomyiidae Newsletter No 13

Spring 2022

David Michael Ackland (1927-2021)

You will have read the reminiscences and tributes in the last Bulletin (Issue 92) and they very much reflect my own few years of working with him on the Anthomyiid data. Michael is seen above collecting in some alpine location in France at a date unknown to me, but perhaps someone can supply the details. We had an extensive e-mail correspondence from which I learnt much not only about the entomology but also useful IT resources such as new file transfer sites. He also supplied me with a reference set of specimens in which every British genus was represented. In March 2019 I had the opportunity to visit him at his home in Bridport and see his well-equipped workroom with the shelves of boxes from around the world.

Sadly, the many species new to science in these boxes may have to remain unidentified for a while Michael had also hoped to develop the keys to the British species into an RES handbook (though he also said that it would have been better to base it all on the genitalia). The DF Committee has agreed that it should be a priority to get these keys into a publishable form.

Anthomyiidae Recording

Although we have suspended verification on IRECORD and so been demoted from the status of a Recording Scheme, records are continuing to come in both from dedicated dipterists and from a wider range of digital photographers and leaf-mine enthusiasts. IRECORD has nice facilities for filtering and displaying records and also you can generate a species list for a family in a given period of time and geographical region. The last Newsletter (No 12 in Bulletin 89) summarised the Anthomyiidae data up to early December 2019 when over 17,000 records had accumulated.

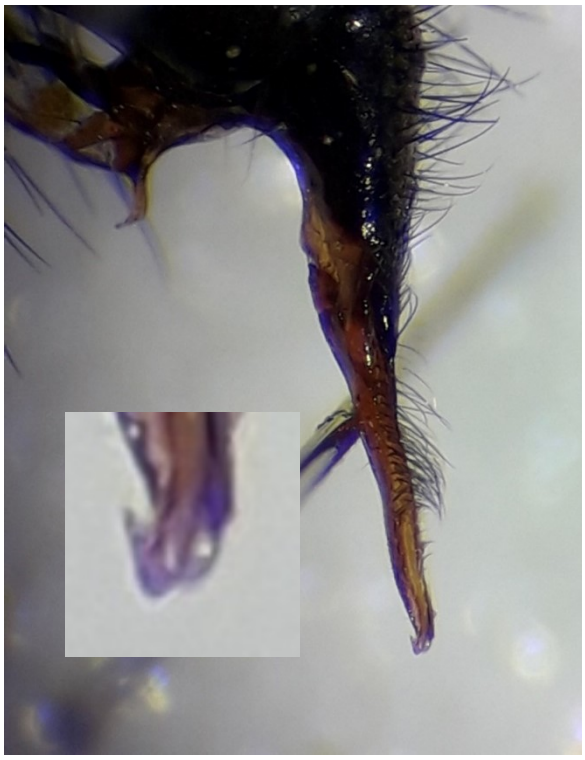
Over the last two years just over 4,700 further records have been entered covering 156 species of which 32 are nationally scarce or rare. Just two of these are discussed below. Meanwhile, please continue to send in records. If you have extensive spreadsheets you may prefer to send them to me at helophilus@hotmail.co.uk and I will upload them to IRECORD on your behalf.

The Anthomyiidae Study Group continues in existence as a list of e-mail addresses for the exchange of interesting observations and queries, and pre-publication copies of these Newsletters. Just e-mail me at the above address if you would like to be added.

Hydrophoria diabata in Scotland

Until last year, there was one record of this species *Hydrophoria diabata* (Pandellé 1899) on IRECORD, from Michael Ackland's own 1965 record from Wytham Woods, the University's ecological laboratory just west of Oxford. Now it has turned up in Scotland twice. On 6 June 2020 Ali Shuttleworth found the species at NT17868348 in the Braefoot Plantation near Dalgety Bay on the north side of the Firth of Forth. The IRECORD comments state that the identification was confirmed by Michael Ackland by email. It was swept among low vegetation in mixed woodland around abandoned WWII buildings in a sunny patch comprising mostly

Dog's Mercury but also nettles and *Dryopteris.* Here is the crucial photograph showing the sharp upturn of the surstylus with a sharp point, differentiating the species from the familiar *H. lancifer.*



This summer on 22 June Sam Thomas found the species in woodland by a river in the hills near Pitlochry in Perthshire (NN881699), with an equally convincing photograph on IRECORD

Hydrophoria diabata was added to Peter Chandler's British checklist only as recently as 2017 (see *Dipterists Digest* **24**, 210) following the addition of Michael's record to the database. Peter gave a reference to Collin (1953) as the first British record of the species. The current checklist notes that it was synonymised with *lancifer* by a no less eminent a dipterist than Hennig in 1969. Michael's previously unpublished details of the differences between the two species are as follows:

"*Hydrophoria lancifer*: Surstyli shorter, apical half in caudal view wider, lateral setae longer. In lateral view tip of surstylus bluntly upturned. Epandrium shorter in lateral view than *diabata*. Sternite 5 processes in basal half with shorter setulae, which are in more than one row.

"*Hydrophoria diabata*: Surstyli longer, apical half narrower in caudal view, lateral setae shorter. In lateral view tip of surstylus sharply upturned into a sharp point. Epandrium longer in lateral view than lancifer. Sternite 5 processes in basal half with a single row of longer, inwardly inclined setulae.

"There may be differences in the chaetotaxy of the legs or thorax, and differences in colour, but I only have 2 males of diabata in my collection. This is not enough to be able to separate normal variation from any differences between the two species.

"Hydrophoria diabata appears to be present in very small numbers compared to the very common *lancifer*. I have seen specimens of *diabata* from Switzerland, and there are specimens in the Hope Dept. in Oxford (Verrall-Collin Coll.). No doubt more males remain to be discovered in other collections mixed up with *lancifer*. They can generally be recognised by the longer epandrium which is often visible even if the genitalia have not been pulled out when pinned."

Komzáková and Michelsen (2015) added the species to the fauna of the Czech Republic and stated that it was previously known from Austria, France, Germany, Great Britain, Greece, and Switzerland.

References

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Botanophila bicilaris locally abundant in Lancashire and Cheshire

Many of us no doubt embarked on special projects as COVID struck in March 2020. I was fortunate in being 20 minutes' walk from a site I've visited occasionally over the years. It is Houghton Green Pool (SJ6292) in VC59 (South Lancashire), which you may have unwittingly passed by as it is adjacent to the M6/M62 interchange. It is a saucer-shaped depression formed by the excavation of stone for the motorway construction and ten years ago it was a lake several hundred metres in extent. Progressive ground-water abstraction has reduced its level over the recent years, so that in dry summers it almost disappears. There are now successive rings of willow which have germinated on the contours that the water level reached in successive years: even in a wet winter the pool reaches only a small fraction of its former size – the photo overleaf shows it in February 2021.

My plan was to undertake weekly 15-minute sweep-net surveys at 6 locations spaced over the willow scrub area to see if one could obtain replicable and comprehensive data on the diptera fauna of a relatively simple habitat

in an early stage of succession. I did indeed manage to carry this through right to the end of September, amassing 3113 records (ie occurrence at a sample location in a particular week) of 381 diptera species. Details of the statistical analysis of this data will appear in a forthcoming paper in the *Dipterists Digest*.

The list of Anthomyiidae with numbers of records was as follows:

Adia cinerella(1), *Anthomyia liturata*(1), *Anthomyia procellaris*(3), **Botanophila biciliaris*(24), *Botanophila discreta*(14), *Botanophila fugax*(7), *Botanophila jacobaeae*(4), *Botanophila sericea*(23), *Botanophila sonchi*(1), *Botanophila striolata*(6), *Delia coarctata*(1), **Delia diluta*(1), *Delia florilega*(25), *Delia platura*(21), *Delia radicum*(1), *Egle ciliata*(3), *Egle lyneborgi*(6), *Egle minuta*(7), *Egle rhinotmeta*(18), **Egle subarctica*(4), *Hydrophoria lancifer*(5), *Hydrophoria ruralis*(1), *Hylemya urbica*(22), *Hylemyza partita*(1*), Lasiomma seminitidum*(3), *Paradelia intersecta*(4), *Paregle audacula(*6), *Pegomya caesia*(1), **Pegomya* ?*sociella*(1), *Pegomya winthemi*(2), *Pegoplata aestiva*(9), *Pegoplata annulata*(41), *Pegoplata infirma*(17), *Pegoplata nigroscutellata*(5), *Phorbia fumigata*(4), *Zaphne ambigua*(1), *Zaphne divisa*(6).

Although this list includes 17 of the top twenty species nationally (Ackland *et al*, 2017), there were also many surprises. The asterisks indicate four species included in the recent Natural England species status review (Falk and Pont 2017). One of these, *Botanophila biciliaris* was the third most frequently encountered, just behind *Pegoplata annulata* and *Delia florilega.* Falk and Pont (2017) classed this as "provisionally data deficient" based on four widely scattered locations, three in Scotland and one in Surrey between 1964 and 1994. The NBN Atlas has two more recent records, from Mike Pugh in the West Midlands in 2012 and from Nigel Jones in Shropshire in 2017. The habitat for the earliest record by Parmenter in Mitcham in 1964 is unknown, but all the others are from waterside locations.

The species has been recorded from several central European countries (Komzáková and Rozkošný, 2009), Finland (Michelsen, 2014) and Denmark (Skipper *et al.*, 2020). In a survey of the Anthomyiidae of six peat bogs in the Czech Republic (Komzáková *et al.*, 2011), it was one of the scarcer species, being found only at one site at just an altitude of just over 1000m. This distribution is reflected in this GBIF map with the intriguing addition of one record in Alaska.

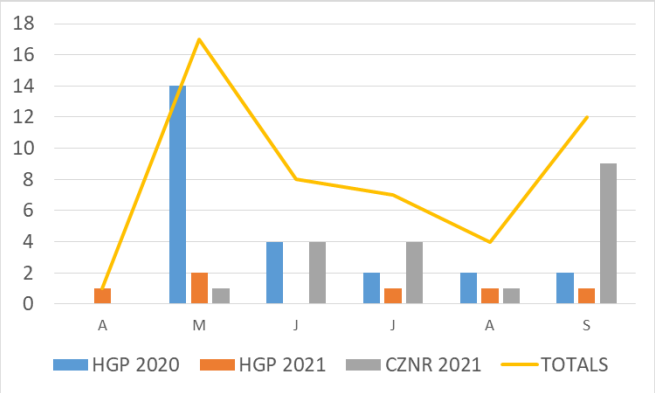
The larval life history of *B. biciliaris* is not known, but curiously the phylogenetic analysis by Leuchtmann and Michelsen (2015) places it next to the globeflower (*Trollius*) parasite genus *Chiastocheta* Pokorny 1889. *Trollius* is a genus in the buttercup family Ranunculaceae, which was well-represented at the site by both *Ranunculus repens* and *R. sceleratus*. Incidentally, Leuchtmann and Michelsen (2015) also list *B. discreta* and *B. striolata* as associated with *Ranunculus* species.

In 2021, I continued with the same survey pattern at Houghton Green Pool, but only once a fortnight to allow more time for recording elsewhere. I have not yet analysed the overall results, but *Botanophila biciliaris* was again present, albeit with only 6 records, a 50% decrease on the previous year after allowing for the halved sampling effort. I also made fortnightly visits to Chester Zoo Nature Reserve in VC58 (SJ4070) where I

took sweep-net samples at 12 locations. The centrepiece of this reserve is a meadow of about 4 hectares in extent, converted from a pasture about 5 years ago by scraping the topsoil and reseeding with native wild flowers. 4 of my sample locations were located in the meadow. Another 4 were in an adjoining marshy strip of land about 80m wide and extending alongside a canal. The other 4 locations were in varied habitats at the periphery of these two main zones, including an area planted with a wide range of native trees, hedgerows and ponds. Remarkably *Botanophila biciliaris* was abundant here as well, a total of 19 records with 10 in the meadow, 4 in the wetland area and 5 in the peripheral sampling locations.

The overall result is that I have obtained 49 records in 2020-1 for a species with only 6 previous records nationally. They are split between two locations 30 km apart. The habitats in the two locations have developed only in the last five years or so, and apart from being relatively open with still water features they are not particularly alike. Buttercups are certainly a common feature.

A chart of the monthly number of records shows a long season with peaks in May and September. Interestingly the May peak is dominated by the 2020 results at Houghton Green Pool while in 2021 there was a late surge of both males and females in September at Chester Zoo.



Amongst *Botanophila* species, *B. ciliaris* is one of the few with an anteroventral bristle on the middle tibia. It is a medium-sized species distinguished by the backward curve of the surstyli, reminiscent of *Hylemya variata* though without plumose antennae. The surstyli with their small projections near the tip in rear view are quite different from any other British *Botanophila.* The species is not covered by the female *Botanophila*/*Delia* key in Ackland *et al* (2017) but my samples included females keying out to couplet 16 for *D. linearis*/*nigrescens* though clearly not either of those.

So it is unlikely that this species would be overlooked by recorders of Anthomyiidae. It seems to be a species with a good dispersive capability which has increased over the last half-century and favours early-succession sites. But whether this has been a steady progression under the radar or a recent population explosion in North-west England remains to be seen. If you do record this species, please include a good description of the habitat in the comments section of IRECORD.

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Swarming in *Paradelia intersecta*

By Martin Drake, martindrake2@gmail.com

My observations that I report here surely cannot be original but a quick search through the Anthomyiidae Newsletters and elsewhere revealed few observations on swarming in this family. In the autumn of 2020 and 2021 I watched several species of flies swarming high up or close to trees in my rural Devon garden. These included the muscids *Hydrotaea armipes* (Fallén), *H. cyrtoneurina* (Zetterstedt), *Hebecnema umbratica* (Meigen) and *H. vespertina* (Fallén), but the fly most frequently seen swarming was *Paradelia intersecta*. This is moderately common species, particularly in the

Table 1. Dates, weather and position of swarms of *Paradelia intersecta*.

Date	Time	Temp. °C	Weather	Position of swarm
30 Oct 2020	10:00	14	overcast, windy	not noted
1 Nov 2020		14		by tall *Salix'alba'*, at 4-6m
4 Nov 2020	14:30	11.1	bright, sunny	by small horse-chestnut *Aesculus hippocastanum*, to one side and slightly below branches, in sunlight, at 1.5m
8 Nov 2020	8:50 and 10:25	12.8	misty, still	by tall *Salix 'alba'*, usually just below now leafless branches, at 4-6m
8 Nov 2020	9:30	12.6	misty, still	by small sallow *Salix cinerea* at 2-3m
11 Nov 2020	8:50	not recorded	warm, overcast, windy	by apple *Malus*, at 1-1.5m
14 Nov 2021	12:15	11.8	¾ cloud, slight wind	by tall birch *Betula* at 2-3m, about 8 flies
14 Nov 2021	13.35	12.0	¾ cloud, slight wind	by ornamental cherry *Prunus cerasifera*, at 1.5-2m, about 12 flies

south and west of Britain (Ackland *et al.*, 2017).

I checked the identity of a representative of each swarm caught using a sweep-net, and released those that were obviously one of previously collected species (examined under a microscope – not in the field). All these individuals were males. It was difficult to estimate the number of flies in any group, particularly against a dull grey autumn sky, so this useful information was not often collected. I have summarised the conditions when these swarms were seen (Table 1).

While there was some variation in the flies' behaviour, a generalised description of the swarming behaviour is given here, based on these separate swarms. Swarms varied in size from about five to perhaps 30 flies. They were found between 1-4m above ground, and only occasionally higher. The flies occupied a sausage-shaped volume about 30-80cm across and up to 4m long for large swarms, positioned just 20-50cm away from the outermost twigs of the tree, so that flies were close to twigs on which they landed but still had a large arena. The volume occupied seemed proportional to the number of flies. The whole swarm sometimes shifted position slightly but the flies showed a strong affinity for just a few twigs on which they landed, and this appeared to fix the position of the swarm.

The flight pattern of individual flies consisted of brief fairly steady motion but almost never true hovering, followed by more rapid darting away, before resuming the steady flight. These two phases lasted only fractions of a second so that, without looking carefully, the flight appeared to be a chaotic zigzagging. The flight path was usually about 30-50cm long although sometimes up to about 100cm. When in flight, the flies rarely got closer than about 5cm to each other, although would often briefly fly on parallel paths before moving apart. When they converged closely, they started a very brief 'dogfight' before separating. The overall effect of the zigzag flight and rapid 'repulsions' was of a chaotic affair but which seemed to involve considerable interaction between flies.

Unlike some swarming flies which remain aloft for a very long time, *Paradelia* showed an alternating swarm-then-rest pattern. The flies took off more or less in synchrony, swarmed for perhaps 30-60 seconds then settled together, although in a rather undisciplined manner so that some flies remained 'swarming' by themselves while others settled well before the majority. After about another 30-60 seconds, they took off again. When the flies settled on the outermost twigs (leafless by mid-November), often two or three alighted within 1-2cm of each other, which suggested deliberate behaviour in view of the huge number of similar twigs available. So their behaviour in flight could be interpreted as more aggressive than when they settled. Their behaviour when they settled could be interpreted as either each fly independently selecting a preferred set of just a few leaves or twigs or, since they often sat close together, they contrived to remain in close visual contact with each other. More likely is a combination of

these, with the initial selection being based on features obscure to a human, then communal behaviour reinforcing their return to the preferred site.

The swarm 'marker' appeared to comprise a vertical surface - a moderately tall twiggy tree - next to open ground - lawn. No *Paradelia* swarms were found where branches formed a more enclosed air-space. Few swarms were found altogether so the population of the garden was highly aggregated despite numerous apparently suitable sites. This strongly suggests that the flies collectively sought their preferred location rather than merely responded to physical cues.

Once the pattern of flight of a species had been recognised, it was possible to distinguish *Paradelia* from the muscids *Hydrotaea* and *Hebecnema* whose flight was less chaotic and included very brief periods of hovering, the swarms lasted for longer between settling, and were positioned further from the tips of branches. In the case of *Hydrotaea cyrtoneurina*, swarming took place in a large but sparsely populated swarm over open lawn. A single male of the anthomyiid *Hydrophoria ruralis* (Meigen) was collected from the lowest part of a swarm but it was not clear whether the higher-flying individuals were this species too or whether this individual was a passer-by among other flies far too high for my net. I am inclined to think that this very common species does not swarm. A small swarm of *Delia platura* (Meigen) was seen on 31 October 2020 beside the roof gutter of the house where I caught a specimen from an upstairs window (8:15 a.m., 14.5°C).

Anthomyiids have been recorded swarming before. Michael Ackland (1997) wrote that *Egle* swarm at sallow blossom in spring on warm days, sometimes at a great height, and later (1998) he reported *Delia cardui* (Meigen) flying rather rapidly around fruit trees. On another occasion a single male of this species was flying rapidly and erratically around a hazel bush on which it landed, selecting the same branch on several evenings, and later several males competed for position of dominating this branch, which was preferred to any other possible perching sites on the bush. These observations are similar to mine and also for the muscid *Hebecnema nigricolor* (Fallén) (Drake 2022). Reid (1940) described flight behaviour of *Delia platura* (as *Hylemya cilicrura* (Rondani)) in North America and his observations suggest swarming similar to that described here.

These few observations suggest that swarming calyptrates have complex behaviour showing considerable interaction between individuals, including synchronised swarming and settling, homing on the same tiny area of twigs, and apparently changing their behaviour from aggressive when in flight to communal when settling. Swarming behaviour is assumed to be linked to mate attraction but to prove this would require considerable effort and diligence.

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Wing-waving display in *Fucellia*

On 1 July, Pete Boardman sent me a video of some curious behaviour in *Fucellia* seaweed flies near Conwy in North Wales. I circulated this to the Anthomyiidae Study Group and lively speculation and debate ensued. It turned out that this phenomenon had been the subject of a study by Memmott and Briffa (2015) at Plymouth University. It still seems curious to find such behaviour in a species without wing markings and with relatively small eyes.

In August, we received another such video from Alan Watson Featherstone, this time at |a Scottish beach. It can be viewed on YouTube at

https://youtu.be/ISvJZLCm3Qw

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