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On 21 January 2020 I shall be attending a lecture at the University of Gloucester by Adam Hart entitled "The Insect Apocalypse" the subject of which will of course be one that matters to all of us. Spreading awareness of the jeopardy that insects are now facing can only be a good thing, as is the excellent number of articles that, despite this situation, readers have submitted for inclusion in this newsletter.

The editorial of **Hoverfly Newsletter No. 66** covered two subjects that are followed up in the current issue. One of these was the diminishing UK participation in the international Syrphidae symposia in recent years, but I am pleased to say that Jon Heal, who attended the most recent one, has addressed this matter below. Also the publication of two new illustrated hoverfly guides, from the Netherlands and Canada, were announced. Both are reviewed by Roger Morris in this newsletter. The Dutch book has already proved its value in my local area, by providing the confirmation that we now have *Xanthogramma stackelbergi* in Gloucestershire (taken at Pope's Hill in June by John Phillips).

Copy for **Hoverfly Newsletter No. 68** (which is expected to be issued with the Autumn 2020 Dipterists Forum Bulletin) should be sent to me: David Iliff, **Green Willows, Station Road, Woodmancote, Cheltenham, Glos, GL52 9HN, (telephone 01242 674398), email:davidiliff@talk21.com**, to reach me by 20 June 2020.

The hoverfly illustrated at the top right of this page is a male *Leucozona laternaria.*

News of the next hoverfly international symposium

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I went to the Greek island of Lesvos in the Aegean Sea for the tenth International Symposium on Syrphidae organised at the University of the Aegean. This was held in the city of Mytilene from 8 to 12 September 2019. The only other person from the UK was Francis Gilbert. Although many British dipterists were at the 2011 Symposium in Glasgow, I often had to point out in Greece that we don't seem to travel well at the present time! However I would encourage more dipterists to consider the next Symposium in 2021. An offer was made by one of the French delegates, and the location is likely to be Marseille in September 2021, although there was a discussion about the possibility of choosing a venue out of the city. Marseille is easy enough to reach, with Eurostar and TGV services making the trip not difficult by train.

It is fascinating to meet so many other people who are also fascinated by hoverflies. There were about 80 this year, mostly from Europe, but with others from further afield, from Brazil, Canada and Russia. The approaches to study often have national characteristics. The Serbians send a strong delegation but have a reputation for creating new species at the sight of a slight change in DNA, so that I did have reservations

about flies that are identical in appearance being named as separate species. The Czech Republic were also well represented.

Besides the lab studies of DNA barcodes there was also plenty of more traditional taxonomy, as well as ecology, evolution, biodiversity assessments and conservation. The introductory lecture was given by Martin Speight from Dublin about insect conservation.

We hope more British dipterists will make it to the next symposium. Although there were such a variety of topics, they were all presented in English, which is the way of international conferences these days.

I am also writing a report of the 2019 meeting in Mytilene for the Dipterists' Bulletin.

Two new hoverfly guides

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This year we have seen two magnificent new guides to hoverflies that may appeal to some readers. Both have some relevance to the British Fauna in the sense that they cover the Palaearctic fauna:

Velgids Zweefvliegen **[Field Guide to Hoverflies]** by Sander Bot & Frank van de Meutter. KNNV Veldgids (Field Guides). A5 Hardback, 388 pages, 1600+ colour photos, colour illustrations, colour distribution maps. In Dutch. (about £31 + p&p)

The promotional advice is that: this is the first field guide to the hoverflies of the Netherlands and Belgium. Identification keys are included. It describes all 382 species that are currently known or might occur in the two countries and is illustrated with over 1600 macro-photos. Species accounts discuss identifying features and relevant ecology, including distribution maps and flight times.

There is no doubt that a lot of hard work has gone into the production of this book and I suspect it will be a welcome addition to the bookshelves of Dutch-speaking entomologists. The species account are accompanied (opposite page) by relevant photographs and arranged with two or three accounts to each double-page byspread. As a non-Dutch speaker, I can only surmise the level of detail, but suspect that it probably compares with our own WILD*Guide*. For the English-speaking entomologist, its value lies in the phenology information and the illustrations, which go some way to resolving questions that we might have about species that we do not know but suspect might be present in the UK.

Production quality is excellent. My only concern is one that I will express about a lot of modern field guides: the illustrations can be rather small and as a result some subtler features may not be as apparent as one might like. Having worked on a British equivalent (albeit not comprehensive) the choices are understandable because the A5 format is quite restrictive of what can be achieved.

For me, one of the most important elements of this book is that the head of each species is depicted to show those characters that may be of particular use in making a firm identification: so, frons characters are depicted where appropriate and face profiles are presented elsewhere. There is much to learn from this arrangement and I expect we will gain a lot from this aspect of the book. Sadly, without a stronger grounding in Dutch I am unlikely to benefit greatly from the text but perhaps the better-educated British Dipterists will fare better than me!

Field Guide to the Flower Flies of Northeastern North America by Jeffrey H. Skevington & Michelle M. Locke *et al*. Princeton Field Guides. A5 hardened, 512pp. (RRP £22.00 +p&p)

The promotional advice is that: 'this is the first comprehensive field guide to hoverflies of northeastern North America. It contains more than 3,000 color photographs and 400 maps, and covers all 416 species of flower flies that occur north of Tennessee and east of the Dakotas, including the high Arctic and Greenland. Each

species account provides information on size, identification, abundance, and flight time, along with notes on behaviour, classification, hybridization, habitats, larvae, and more. The 3000+ colour photos (field and museum shots) include also multiple images per species, with arrows highlighting key field marks; greyscale images showing the actual size of the insect; and there is a range map for each species.

In common with the Dutch guide, one has to start with complimenting the authors on a magnificent piece of worth that is beautifully laid out and illustrated. The scale of the job is on a par with that of the Dutch guide, perhaps more so, as the book itself is some 120+ pages longer.

In common with all field guides that attempt to pack a huge amount into the format, the authors face an insurmountable problem: how to provide sufficient information to aid identification, yet to do so in as economical a manner as possible. For a North American readership this book will be invaluable as it starts to open up a fauna that has otherwise been the preserve of museum curators and specialist devotees. To further aid popularisation, colloquial names have been constructed for each species; none that I saw really grabbed me as a name that might have some resonance and stick.

The authors will doubtless have anticipated my biggest wish – that there should be keys to species! Having attempted to produce a field guide without keys, I well appreciate the problems that the authors faced! The sheer volume of species involved means that a comprehensive guide would be an order of magnitude bigger and is a job that can only be tackled once there is sufficient demand for such a book. This guide is the first step on that path and as such it does a very good job of introducing hoverflies to a new readership.

From the perspective of an occupant of a small island off the coast of Europe, this book probably won't be the first one I reach for when I need to check something relevant to the British fauna; nevertheless it is a welcome addition to my library and should I ever travel to northeast North America I will have a fighting chance of making my way a little inland!

Hoverfly Recording Scheme Update – Spring 2020

Stuart Ball, Roger Morris, Joan Childs, Geoff Wilkinson & Ellie Rotheray

In our last report (June 2019), we asked 'will hoverfly numbers be any better than they were in early June'. At that time, there was a feeling that hoverfly numbers were lower than expected. By October, the results looked more positive, but one can never be certain when looking at raw data. Bearing in mind that there are a lot of data to incorporate at the time of writing, the only consistent comparison can be made with data extracted from the UK Hoverflies Facebook page. These data tell an interesting story, as the numbers of records greatly exceed 2018 (Figure 1a), whereas the numbers of recorders (Figure 1b) only exceeded 2018 from July onwards. Numbers of species (Figure 1c) are far closer to the data for 2017 but vary from month to month.

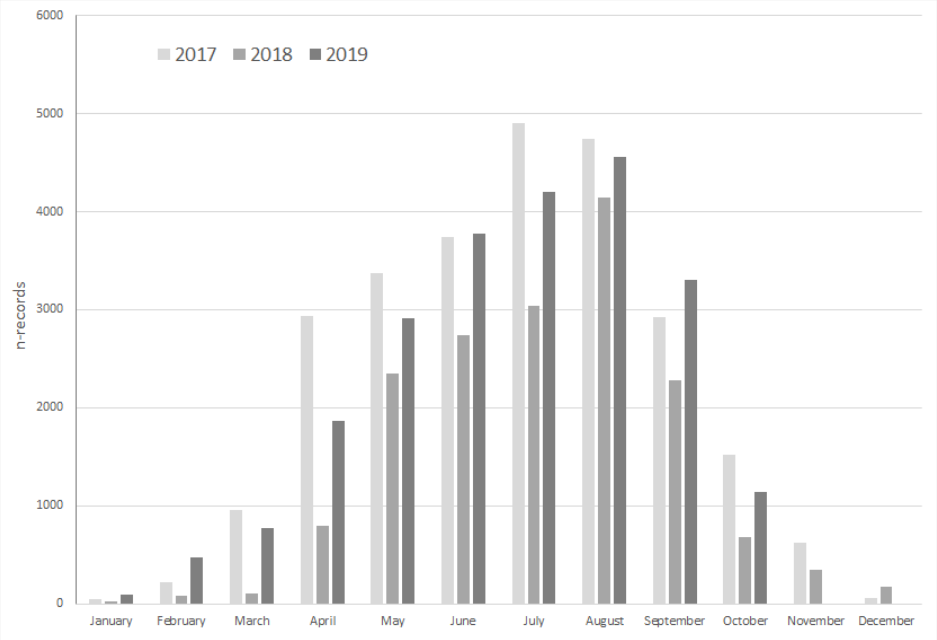

Figure 1a. Numbers of records

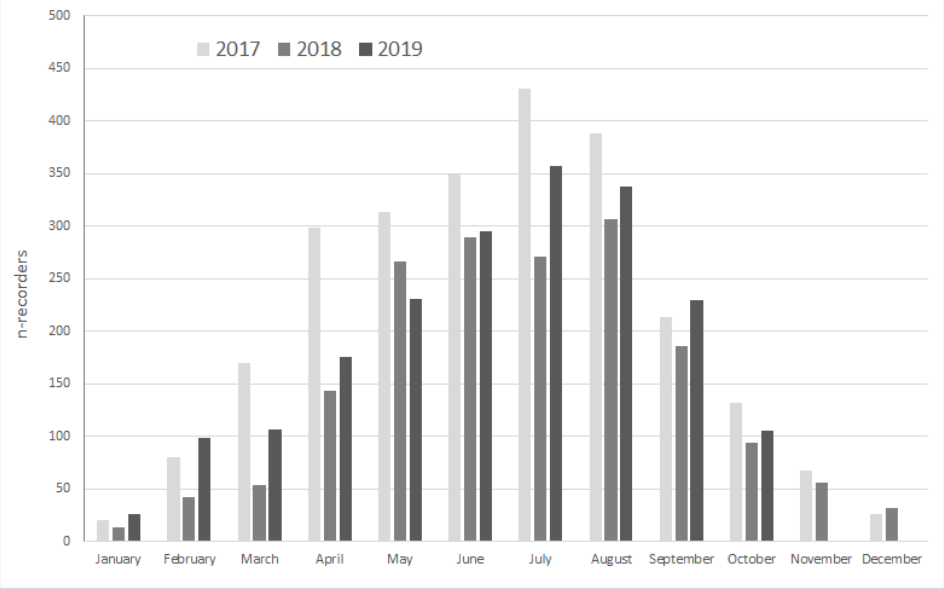

Figure 1b. Numbers of recorders

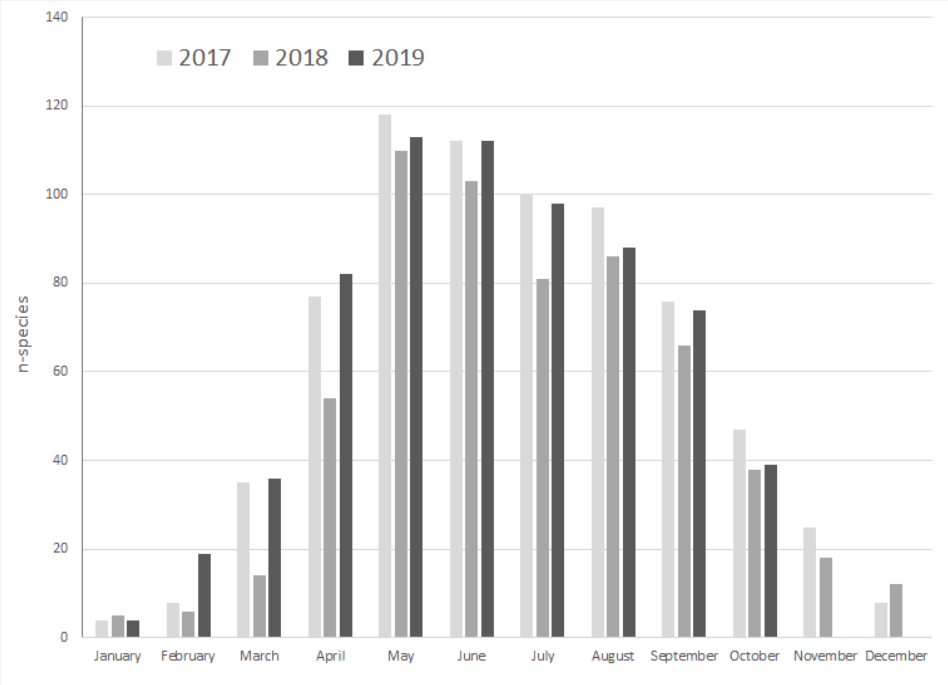

Figure 1c. Numbers of species

Is it possible to draw any conclusions from these graphs? Comparing year on year data is always challenging; the weather is different, the preceding winter was different, the recorders differ (although given enough records, these differences smooth out to some extent). Nevertheless, all three graphs strongly suggest that 2018 differed from both the preceding and following years. It must be remembered, however, that in 2018 the spring was delayed (or closer to the norm of 30 years ago).

Looking at the shapes of the three plots, there seem to be some parallels between 2018 and 2019 but for different reasons: In 2018, June and July were terribly hot and dry, whereas in June 2019 there was above-average rainfall. The end of July turned out to be equally scorching and the monthly average was the 8th warmest since 1910! That seems to show in the data because the numbers of records in July were lower than August despite more recorders in July! The numbers of species recorded each month appear similar to 2017, thus emphasising the anomalies of 2018. Unlike 2018, there were also important regional differences, with southern and eastern England experiencing a heatwave (especially on 25 July) whilst northern and western Britain were much cooler and wetter.

The effects of the 2018 heatwave continue to impact on some species. Low numbers of *Rhingia campestris* in southern and eastern England are still evident, whilst numbers of *Sericomyia silentis* across the country seem to be exceptionally low. *Platycheirus granditarsus* and *Leucozona lucorum* also seem to have suffered disproportionately. Others, such as *Volucella pellucens* and *V. zonaria* seem to have bounced back! The big question is whether any dips are short-lived or long-term impacts? We won't know for several years, but it is possible to develop a convincing conceptual model that links extreme temperature and drought effects to an overall decline in insect numbers in southern and eastern England. An analysis of the 2018 situation has been prepared for *Dipterists Digest* and should appear in the next issue.

There were relatively few major highlights in 2019, but it is heartening to find that *Doros conopseus* continues to be recorded from two well-known sites: Yealand Hall Allotments and Martin Down NNR. *Callicera rufa* made its customary appearances south of the Scottish border, with two reports from the same locality in south Wales and a report of larvae in artificial rot holes in Derbyshire. Clearly, it is quite widespread across the Midlands and Wales and could be found in many more locations so there is a strong case for creating artificial rot holes wherever the opportunity arises; and, maybe lekking males will be found at more locations if suitable pines are investigated. *Callicera spinolae* also continues its march southwards, with the most recent being from Mitcham Common in south London in October. Surprisingly, there were no reports by the Facebook group.

Two species turned up in exceptional numbers in 2019: *Meligramma euchromum* and *Parasyrphus nigritarsis*. It is possible that *M. euchromum* benefitted from the heatwave of 2018, but the reason behind the rise in numbers of *P. nigritarsis* lies in the numbers of people looking for larvae. Now that its larval habits have become known, it has proven to be a lot more common than was once thought.

HRS data used to good effect?

There is a constant stream of requests for access to HRS data. Sometimes they result in papers that have a significant impact. Two recent papers have gained a fair amount of interest:

> Wotton, K.R., Gao, B., Menz, M.H.M., Morris, R.K.A., Ball, S.G., Lim, K.S., Reynolds, D.R., Hu, G. and Chapman, J.W. 2019. Mass Seasonal Migrations of Hoverflies Provide Extensive Pollination and Crop Protection Services. *Current Biology* **29**, 2167-2173 DOI: 10.1016/j.cub.2019.05.036

The authors used insect-monitoring radars to show that up to 4 billion hoverflies travel to/above southern Britain each year in seasonally adaptive directions. Their analysis also found that abundance of migratory hoverflies fluctuated greatly between years but that there was no evidence of a population trend during the 10-year study period.

> Powney, G.D., Carvell, C., Edwards, M., Morris, R.K.A., Roy, H.E., Woodcock, B.A. and Isaac, N.J.B. 2019. Widespread losses of pollinating insects in Britain. *Nature Communications* **10,** 1018.

This paper demonstrates substantial inter-specific variation in pollinator trends, based on occupancy models for 353 wild bee and hoverfly species in Great Britain between 1980 and 2013. It estimates a net loss of over 2.7 million occupied 1 km^2 grid cells across all species and argues that declines in pollinator evenness suggest that losses were concentrated in rare species.

These are important and influential uses of the HRS data and show how vital it is to continue to maintain and grow the network of recorders. At this point, the HRS dataset is the third largest invertebrate dataset after Lepidoptera and dragonflies. Will we catch up and overtake the dragonflies? That is a big challenge, but not impossible! Growth in recorder activity has been phenomenal ever since the development of the UK Hoverflies Facebook page. We do, however, need to keep an eye on the data for species that cannot be identified from photographs. Stuart and Roger have recently submitted a paper that shows how photographic records can affect the assessment of trends. Hopefully it will be accepted and be influential on the development of more refined models. Meanwhile, we continue to encourage recorders to retain specimens (Roger will identify them if sent in the winter).

Meanwhile, Stuart has been looking at the effectiveness of predictive models linked to environmental variables. His results provide plenty of food for thought, but they also highlight the importance of improving coverage in many parts of Britain, especially Scotland and northern England. Part of the problem lies in the degree to which it can be assumed that the most common species have been recorded and thus how many absences are likely to be genuine. So, do please make sure that you aim to generate lists which are as complete as possible, especially when visiting new and out of the way places: the models will only ever be as good as the data permits!

Ideas for future activity

Reports of flower visits in the 'Biological Floras' published in the *Journal of Ecology* often contain scant records of insect visitors, even for plants such as ivy that are well-known lures for autumnal flower visitors. Stuart and Roger recently reviewed HRS data for ivy visitors and have a paper accepted for *Dipterists Digest* that extends the recorded list from 23 species (including two dodgy records) to 82 species. We can now be pretty sure about the species of hoverflies that are likely to be significant pollinators. There are innumerable other plants that could be investigated and published as stand-alone accounts. There is therefore a great opportunity to develop the theme further and try to improve our knowledge of what the main flower visitors are.

If you know of a good stand of an unusual plant and fancy developing a species list of insect visitors, there are plenty of opportunities. Even widespread and abundant species are comparatively poorly reported; for example, there are no insect visitors to Horse Chestnut reported and the well-known occurrence of

Brachyopa insensilis is also omitted! The only real challenge is having the patience to stop and watch, perhaps for several hours at a time! Anyone wanting to check on species that have been covered can find them on the British Ecological Society's *Database for the Biological Flora of the British Isles* which lists 350 species, many of which were described several decades ago. If the plant is not covered then there is even more justification for making the effort so that there is a detailed account available as and when the need arises.

Following on with this theme, a recent article by John Feltwell drew attention to the possible value of sweet chestnut as a nectar and pollen source during times of thermal stress (Sweet Chestnut flowers, a life-saver for insects during the 2017 drought in the Occitanie region of France; *Br. J. Ent. Nat. Hist*., **32**: 211-216). Under normal circumstances most Dipterists probably ignore this potential nectar source but perhaps more attention needs to be paid to this species. Who can come up with a comprehensive list?

Developing targeted monitoring

When the species status review for hoverflies was prepared (Ball, S.G. & Morris, R.K.A., 2014 *A review of the scarce and threatened flies of Great Britain. Part 6: Syrphidae. Species Status 9*), there was very little data available for *Caliprobola speciosa* but equally there was no reason to believe that its situation had changed. Put simply, it seemed that as nobody recorded regularly from the New Forest, there were no records of this charismatic species. Since then, we have been given to understand that people who visit the Forest believe that it has declined. We still have no data though! As a result, we want to develop a programme of regular monitoring of this species and encouraging efforts to locate it away from the honeypot sites. A post on the Facebook page generated a lot of interest and as a result we are looking for somebody to take on the role of coordinating the effort and making sure that the results are analysed.

On a broader level, perhaps it is time to encourage other regular surveys for readily recognized species? Some that come to mind are:

Anasimyia interpuncta, which is mainly known from East Anglia but seemingly occurs also on several grazing marshes on the south coast and in the Thames Estuary and Somerset Levels.

Doros conopseus which has been checked for fairly regularly in north Lancashire and, in recent years, has been regularly reported from Martin Down NNR. But there are other known centres of population.

Lejops vittatus which is found in various grazing levels, mainly on the south coast and Thames Estuary, but also in Somerset and Norfolk.

Microdon devius on its various haunts; there is scope for several local groups to be established, as there are populations in the Chilterns, Norfolk, Kent, Surrey and Sussex as well as North Wales and a very old record from the Wyre Forest.

These are just a taster and maybe offer the first thoughts that might lead to the establishment of local hoverfly groups? The HRS is starting to get to a size where it really needs an element of regional organization, so the development of monitoring groups might be a first start.

UK Hoverflies Larval Group

Geoff Wilkinson, Ellie Rotheray, Nicola Garnham & Joan Childs

The UK Hoverflies Larval Facebook Group was established in July 2015 to promote better recording and study of immature hoverflies. It is open to anyone in the UK and Ireland, whether novice or expert, to encourage one another by posting photos, helping with identification, sharing observations and developing

techniques for finding and rearing the early stages. The group complements the UK Hoverflies Facebook Group which focuses on adults and the Hoverfly Recording Scheme (HRS).

Our group now has over 660 members whilst the UK Hoverflies Facebook Group boasts over 4,500. The numbers reflect a historic bias in favour of the adult insect. This is understandable since the early stages are often harder to find and most identification keys such as Stubbs and Falk (2002) rely on adult characters. The best identification key for early stages can be found in Rotheray (1993) which enables the identification of around 40 species in their larval form. Consequently, most early stages need to be reared to adulthood for identification and the extra delay, effort and uncertain success can be discouraging to many naturalists.

Nevertheless, finding and rearing immature hoverflies provides additional ecological information that cannot be gleaned from adults alone. Learning about larval habits can be critical for determining species status and initiating conservation action as exemplified by the Malloch's Society work on Priority Biodiversity Action Plan (BAP) flies *Blera fallax* and *Hammerschmidtia ferruginea* (Rotheray & MacGowan 2015). For some species it is easier and more appropriate to record larvae than the more elusive or difficult to identify adults. This appears to be the case for *Callicera rufa*, *Parasyryphus nigritarsis*, *Microdon mutabilis* and *M. myrmicae*. Finally, the early stages are fascinating in themselves and our limited information about them provides fantastic scope for original research and observations.

Selected highlights

The following snippets which have been contributed by members of the UK Hoverflies Larval Facebook Group provide some idea of the group's activities. There may be some errors and omissions. Hopefully a more complete and detailed report will be compiled soon.

Callicera rufa. Notable records include a dead larva from a Scots pine rot-hole in April 2017 at Montreathmont Forest, Angus, Scotland; a first county record (Geoff Wilkinson). In England, larvae were found in artificially created rot-holes at Dovestone, Greater Manchester and Longshaw Estate, Derbyshire in September 2017 and August 2019 respectively (Ken Gartside, Joan Childs & Rob Foster). Larvae can be recognised in the field in all stages by their short rear breathing tube and possession of two groups of three to four black hooks on either side of the prothorax (Fig. 1). Larvae can be found throughout the year and searching suitable development sites will likely produce a more accurate picture of their distribution in England as it did in Scotland (see Rotheray & MacGowan 2000, Ball and Morris 2013).

***Epistrophe nitidicollis*.** This species appears to be unique among congeners in possessing fleshy papillae on the lateral margins giving a toothed appearance to the larval outline (Mazanek et al. 2001). The remaining British species have a smooth margin. (Fig 2). We received two records of larvae fitting this description: 3 larvae in cherry leaf curls feeding on *Myzus cerasi* aphids at Warton Crag LNR, Lancashire in June 2019 (Nicola Garnham) and 2 dormant larvae on the ground in a garden near Poole, Dorset in July 2019 (Jim Gardner). These appear to be the first known larval records from the UK.

Eriozona syrphoides. A larva was photographed making its way along someone's trouser leg at Llyn Coed-y-Dinas, Montgomeryshire in October 2016 (Paul Roughly). In August 2017 a larva was found in a giant willow aphid *Tuberolachnus salignus* colony near Lewes, Sussex with a male reared in captivity (Ellie Rotheray) (Fig 3). The report of larvae feeding on giant willow aphids is notable as previous observations only mention an association with spruce aphids (Speight 2018).

Eristalis arbustorum. Larvae were found among *Eristalinus aeneus* in a rock-pool of decaying seaweed at Boddin Point, Angus in July 2018; first rearing record from this habitat (Wilkinson 2019a). The usual larval development site for *E. arbustorum* is nutrient enriched freshwater both temporary and permanent, especially in an agricultural setting (Speight 2018).

Parasyrphus nigritarsis. The adults are tricky to identify and can be overlooked among similar looking syrphids such as *Syrphus*. The larvae, in contrast, are easily identified due to their unique colour pattern and being the only hoverfly to routinely feed on immature leaf beetles on dock, willow and alder (Rotheray,

1993; Childs, 2017) (Fig. 4). Records were received throughout May and June from Wiltshire, Yorkshire, Lancashire, Cumbria, Derbyshire (England), Ayrshire, Highland, Aberdeenshire, Orkney (Scotland) and Antrim (Northern Ireland). All sightings were associated with *Gastrophysa viridula* leaf beetles on broad-leaved dock. The white eggs of the hoverfly contrast strongly with the orange eggs of the beetle and the larvae can be spotted feeding on the egg clusters, pupae and larvae of the leaf beetles. A broader search for larvae will likely reveal this species to be more common and widespread than records based on adults suggest.

Mallota cimbiciformis. Larvae were found in January 2018 in rot-holes of horse-chestnut and sycamore at Pollok Park, Glasgow (Wilkinson 2019b). The 'long-tailed larva' is superficially similar to *Myathropa florea* but has three pairs of short, fleshy lateral projections at the base of the 'tail'; this feature can be seen on the puparium too. With the aid of a hand-lens the larvae are readily identified in the field when sufficiently cleaned of gunk from the rot-hole!

Melanostoma. Very little is known about the larval habits of *Melanostoma*. In captivity they readily accept a wide range of aphids but are scarcely found at aphid colonies in the wild. This is curious, given the abundance of *M. scalare* and *M. mellinum*. Rotheray (1993) speculated they were generalist predators in leaf litter. The group has made some progress in furthering our knowledge by providing over 66 records of 88 *Melanostoma* larvae and puparia. Larvae can be readily identified to genus from a good photograph but an adult is required for species identification. A smaller subset included 19 records of 23 reared *Melanostoma scalare*. Only three *M. scalare* larval records were from aphid colonies (on hogweed and broad-leaved dock) with the majority of the rest found in winter leaf litter between October and April. Observations confirmed that larvae were active throughout the winter feeding on cohabiting Diptera larvae such as Lauxaniids and Lonchopterids as first reported in Wilkinson & Rotheray (2017). There were two records of *M. mellinum*: from *Cavariella* aphids on hogweed and from cabbage inhabited by aphids and lepidopteran larvae; in captivity *M. mellinum* were observed readily capturing and eating lepidopteran larvae (Nicola Garnham).

Microdon mutabilis. The larvae are predators of ant larvae mostly in nests of *Formica lemani* found under stones in sparsely vegetated, well drained soils. The closely related *M. myrmicae* lives in the nests of the ant *Myrmica scabrinodis* found in tussocks in wet situations. At present *M. mutabilis* is only reliably distinguished from *M. myrmicae* by features of the early stages and differences in larval prey (Schonrogge et al. 2002). Larvae and puparia were reported in 2018 and 2019 between December and April from Eilean Dubh, Isle of Mull (Geoff Wilkinson) and various sites in the limestone regions of Cumbria and Lancashire such as Arnside Knot, Gaitbarrow, Hutton Roof, Trowbarrow and Yealand Allotment (Nicola Garnham, Mo Richards). (Fig 5).

Cheilosia. *C. grossa* and *C. albipila* have been routinely found in the stems and roots of thistles, particularly marsh thistle throughout July to August. These two species can be identified in the field as described in Ball and Morris (2013). Splitting a multi-stemmed plant with a knife will often reveal a brown stained feeding tunnel and the larva within. Also from marsh thistle were several rearing records of *C. fraterna* and *C. proxima*. Non-thistle *Cheilosia* included *C. albitarsis* in the root of creeping buttercup in September 2016 from Angus, numerous *C. longula* from the disintegrated bodies of bolete fungi from Speyside, Scotland in September 2018, and several records of *C. variabilis* larvae found in the roots of common figwort throughout July to September at sites in Angus and Aberdeenshire.

***Volucella*.** The group received several reports of *Volucella* associated with social wasp nests where the larvae are scavengers and predators of immature wasps. There were 10 records of *Volucella pellucens/zonaria* and 7 records of *V. inanis*. The only confirmed *V. zonaria* was of 2 larvae found near a vacated wasp nest at Cuerden Hall, Lancashire in January 2019 which were reared to adulthood (Kevin Lee) (Fig. 6). Most records came from residential properties where larvae appeared on the carpet during autumn/winter looking for pupation sites after vacating wasp nests in the attic. Additional sightings came from active wasp nests that had been dug out by badgers.

Leaf Litter. During the autumn and winter many members turn their attention to finding larvae in woodland leaf litter. Most aphid-eating species winter as mature dormant larvae and pupate the following spring (a few may delay pupation for several years). Sycamore can be particularly rich especially as it often hosts a late summer bloom of *Drepanosiphum platanoides* aphids. *Syrphus* is the most frequently reported group and a few recorders reared adults to confirm the identities of *S. ribesii*, *S. torvus* and *S. vitripennis*. Other frequent species though less abundant included: *Epistrophe grossulariae*, *Melanostoma scalare*, *Parasyrphus punctulatus* and *Dasysyrphus albostriatus*. Also recorded were smaller numbers of *D. tricinctus*, *D. venustus* ss., *Melangyna cincta*, *Meliscaeva auricollis*, *M. cinctella*, *Platycheirus scutatus* sl., *Baccha elongata*, *Epistrophe eligans* and *Leucozona glaucia*. A record of *Scaeva* sp. from deciduous leaf litter from January 2019 is interesting but, unfortunately, without examination of the larva cannot be ascribed to a species. Of the non-vagrant species *S. pyrastri* is said to overwinter as a puparium whereas the conifer-associated *S. selentica* does so as a larva (Speight 2018).

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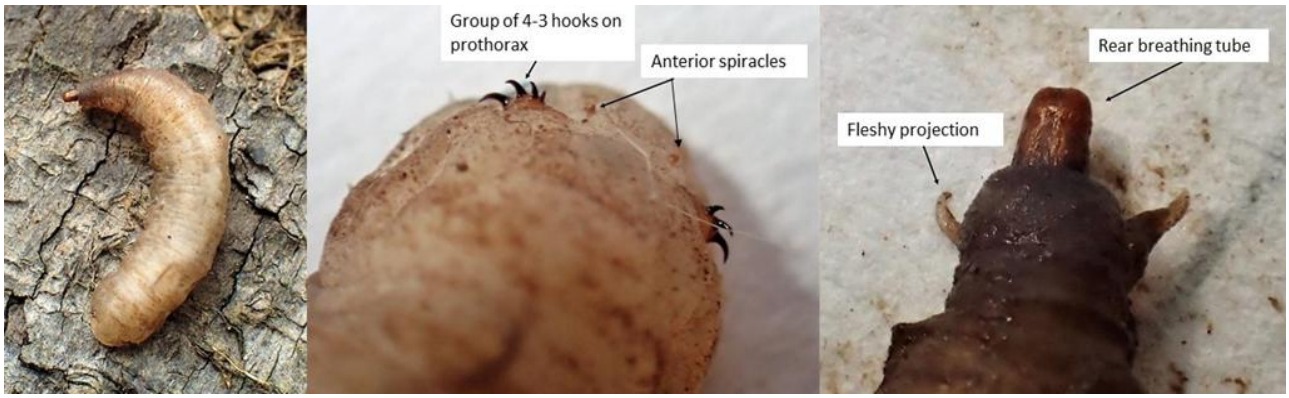

Figure 1. *Callicera rufa* larva. Geoff Wilkinson

Figure 2. *Epistrophe nitidicollis*. 1) active larva 2) dormant larva with *E. eligans* bottom 3) rear breathing tube. Nicola Garnham.

Figure 3. *Eriozona syrphoides*. Larva, puparium and adult male. Ellen Rotheray.

Figure 4. *Microdon mutabilis*. Larvae and puparia in ant nest of *Formica lamani* under stones. Nicola Garnham/Geoff Wilkinson

Figure 5. *Parasyrphus nigritarsis*. 1) Eggs 2) hatched 1st stage larva and eggshells 3) 1st larva 4) 3rd stage larva feeding on larval leaf beetle on broad-leaved dock. Geoff Wilkinson

Figure 6. *V. zonaria* larva, puparia and adult (Kevin Lee)

Something to look out for in May/June - Hoverfly *Parasyrphus nigritarsis* – eggs and larvae

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Last spring, I had a tip-off that the hoverfly *Parasyrphus nigritarsis* had been discovered occurring locally in North Derbyshire. Not that anyone had knowingly seen the hoverfly itself, which is very elusive. The trick for discovering its presence, apparently, was to look for single white eggs on laid on top of the clusters of the yellow eggs of green dock-beetles (*Gasrophysa viridula*) laid on the undersides of dock leaves. I knew of a local site, so infested by dock beetle that the dock leaves were chewed almost to lacework with holes. I checked it out and found dock beetle egg-clusters aplenty. After a little searching, I found, on them, not only the eggs of *Parasyrphus nigritarsis* but larvae in their early stages - probably just a week old - feeding not just on beetle eggs but on the newly hatched beetle larvae.

Parasyrphus nigritarsis egg (white) and larva on dock beetle egg cluster (yellow),

Parasyrphus nigritarsis larva feeding on on dock beetle larvae
Photos: Rob Foster

I decided to make an attempt at breeding out the larvae and collected a few. They were doing all right; feeding voraciously on dock beetle larvae and even pupae - very active and growing fast.

Parasyrphus nigritarsis larva

mature lava feeding on dock beetle pupae

Photos: Rob Foster

Then I had a few casualties due to my inexperience and neglect. Only one survived; this too suddenly stopped eating and was hardly moving at all. I feared the worst, expecting another fatality, until I realised it had gone into a semi-hibernatory diapaused state. I found it somewhere cool but frost free to spend the winter: just keeping it on a paper tissue in a jam jar with the cap pierced with holes together with a few moistened balls of paper to keep the humidity up and stop it drying out.

It remained, without moving at all for nearly 8 months, until it finally pupated in mid-April.

Diapaused Larva 24-3-2019

Pupa 17-4-2019

Photos: Rob Foster

The adult hoverfly emerged a few weeks later. I was intrigued to know how it would look, as I had never knowingly seen it in the wild. I realise now, however, that it is quite possible that I might have without recognising it. It looks very much like very common Syrphus hoverfly species and would easily pass unnoticed amongst them, distinguished only by its black tarsi.

Emerged adult (female) hoverfly 28-4-2019 Dorsal view- doing a bit of wing cleaning

Photos: Rob Foster

I released it close to where I had found its egg: a home-coming of sorts.

Cheilosia ranunculi bred from Bulbous Buttercup

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I have been recording the occurrence of the closely similar hoverflies - *Cheilosia albitarsis* and *C. ranunculi* in my part of the Derbyshire Peak District for a number of years in the hope of elucidating whether *C. albitarsis* is associated with the larval food-plant Creeping Buttercup *Ranunculus repens* and *C. ranunculi* is associated with Bulbous Buttercup *Ranunculus bulbosus*. According to *British Hoverflies* (Stubbs and Falk) at the time the 2nd edition[1] was published (2002), this was suspected but not resolved. *Cheilosia ranunculi* had only just been separated off from the *C. albitarsis* s.l. complex on the basis of several characteristics, especially the shape of the front feet (tarsi 5) of the males. In the UK, this species was initially described by Gibbs[2] as *Cheilosia albitarsis* "form A". It was named as *Cheilosia ranunculi* - a species nova in its own right by Doczkal[3] on the basis of European specimens collected from "Southern England to Northern Spain and Eastward to Bulgaria". From re-examinations of past collections of *Cheilosia albitarsis* agg, in the UK, it was established that *C. ranunculi* was of more local occurrence and rarer than *C. albitarsis* s.s. and was more likely to be found on dryer better drained sites. It was concluded[1] - "The host plant is almost certainly a buttercup, but it seems questionable whether two such closely related hoverflies feed on creeping buttercup; bulbous buttercup would seem to be a potential candidate on dryish sites." Doczkal[3] confirmed "The host plant of *C. ranunculi* is still unknown. From its preferred sites in S.W. Germany I presume it will be found to be *R. Bulbosus* L." Doczkal[4] reported observing female hoverflies, tentatively identified as *Cheilosia* c.f.*ranunculi*, egg-laying on Bulbous Buttercup in 2001. Apart from this, I am not aware that any attempt has been made subsequently to confirm this conclusion.

Cheilosia ranunculi male on Bulbous Buttercup flower
Photo Rob Foster

Bulbous Buttercups are distinguished from other buttercups, as you would expect, by the fact that they arise from a bulb-like corm. However, even without digging them up they are readily identifiable since the sepals of their flowers curl downwards, away from the cup of petals, whereas the sepals of other buttercups curl upwards clasping the cup (apart from the Hairy Buttercup *Ranunculus sardous*, but this is distinctively hairy and unlikely to be encountered in the Peak District). Whenever I had found *C. ranunculi* locally, I had also been able to find Bulbous Buttercups. But, since almost inevitably, the very common Creeping Buttercups and Meadow Buttercups were also present, no conclusions could be drawn. Bulbous Buttercup tends to flower earlier than other buttercups and to have a short flowering period. Last year, in the early spring, I found a field in which, judging from sepals, the flowering buttercups were almost exclusively Bulbous Buttercups. Furthermore, I collected seven Cheilosia males from the field and all of them proved to be *C. ranunculi;* none were the normally very common *C. albitarsis*. Although no reliable way has been found to distinguish female *C. albitarsis/ranunculi*, it seemed reasonable to assume that if I collected females from this field they would also be *C. ranunculi*. I collected about half a dozen each of males and females and introduced them to each other in a netting cage together with flowering Bulbous Buttercup plants (identified by their sepals) dug up from the field and planted in a pot.

The hope was that I could get the hoverflies to lay eggs from which I could rear larvae. It got off to a bad start. They seemed to ignore each other; getting them to mate seems as difficult as pairing pandas. There was also the question in my mind as to how long after mating I would need to wait, keeping the females alive, before I might expect any egg-laying.

Fortunately the nectar and pollen of the flowers on the buttercups proved an adequate food source. Eventually after about a week, to my relief, I noticed females heading purposefully from the flowers of the Bulbous Buttercups down the stems with their ovipositors extended (as described by Doczkal[4]). Subsequent examination of the base of the stems revealed a number of eggs laid singly or in loose groups, mostly inside the rim of dead leaf bases above the underground bulb/corm. Eventually the hoverflies died naturally. I then placed the pot in a sealed fleece bag and placed it outside. The buttercups and their charge of hoverfly eggs/larvae were then left to develop until the late autumn, with little attention except the occasional watering. The development of larvae of *Cheilosia ranunculi* appears not to have been described, but is presumably along the lines of the closely similar *C. albitarsis*. Larvae of *Cheilosia albitarsis* are known[5] to

hatch from their eggs, penetrate into the stems/roots of creeping buttercups, then go into diapause without much further development until the autumn when the fleshy roots are most charged with starch etc. The larvae then feed on the roots though the winter and pupate in the soil. It is reasonable to assume that the larvae of the closely similar *Cheilosia ranunculi* would do much the same thing, though consuming the bulb of the Bulbous Buttercup rather than the roots.

Egg-laying by *Cheilosia ranunculi/albitarsis* on Bulbous Buttercups

Photo Rob Foster

Photo Rob Foster

Cheilosia ranunculi males and presumed females introduced to potted Bulbous Buttercups in a net cage. Egg-laying at base of buttercup plants by females was seen after about a week.

Photo Rob Foster

Photo Rob Foster

Eggs were mostly laid inside collar of dead leaf stalks at base of buttercups.

Having over-wintered the pot of Bulbous Buttercups in a frost free shed, in the early spring, I removed the soil and carefully sorted through it searching for pupae. It was notable that hardly any bulbs were found and that those that were found proved to be hollowed out with worm-holes, suggesting that most of them had been consumed by the larvae. About 20 pupae were found; they were clearly hoverfly pupae. The larval integument, which forms the outer surface of the pupae, indicated that the larvae must be similar in form to those of *C. albitarsis* agg. larvae extracted from buttercup roots described by Rotheray[6]. In particular: "the [larval] body ends in a flat disc with the PRP [posterior respiratory process] in its centre: prp with four pairs of apical projections and anal opening transverse". As can be seen in the photo, the PRP appears octagonal in end-view, cut in half by a slot: formed by a circlet of 8 blunt spurs (4 on each side). At a length of @7mm the pupae seemed smaller than might be expected given the size of the adult *Cheilosia ranunculi/albitarsis* flies. Perhaps there was insufficient food in the bulbs for this number of larvae. I transferred the pupae into the folded tissue and placed them in jars with perforated lids, together with balls of damp tissue to maintain humidity. These were then stored in a cool shed awaiting emergence.

Cheilosia ranunculi pupae bred from Bulbous Buttercup

Photo Rob Foster

Photo John Leach

I was aware that only if I bred identifiable male *C. ranunculi* would I be able to demonstrate a connection between this species and Bulbous Buttercup. Eventually about 20 flies emerged. Amongst these were 7 males, all of which were clearly *C. ranunculi* - as demonstrated (see photos) by the slightly tapering rather than spade-shaped front feet, the broader-than-long 3rd segment of their antennae, the entirely white hairs along the edge of tergite 2 of the abdomen and specifically the lack of a clump of black hairs in their anterior (front) corners. The clinching difference is the slim surstyli of the male genitalia (see photo) which are quite different from those of *C. albitarsis* (see Steven Falk's illustration from *British Hoverflies* (Stubbs and Falk)[1]). Local hoverfly expert, Derek Whiteley, checked them over to confirm the identification.

Cheilosia ranunculi males raised from eggs laid on bulbous buttercups

The photos below were taken of specimens obtained from the breeding experiment and the characteristics shown were exhibited by all the bred males.

Photo John Leach

Photo John Leach

Cheilosia ranunculi shares with *C. albitarsis* characteristic tarsi with segments 2-4 pale, contrasting with black segments 1 and 5. However, in *Cheilosia ranunculi* the black front feet (tarsi 5) are not parallel-sided, but converge towards their apices. Amongst other distinguishing features; the antennae of *C. ranunculi* are broader than long and tend to be dark brown rather than black -

Photo John Leach

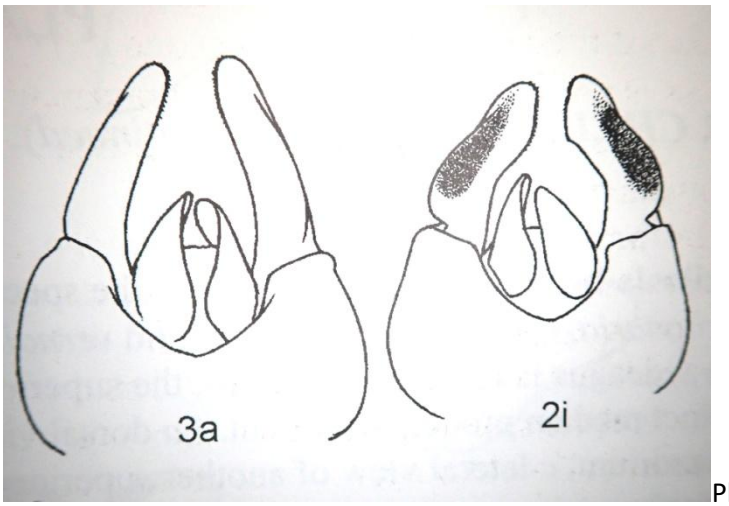

Illustration Steven Falk

Left: Dorsal view of epandrium of genitalia showing slim surstyli consistent with *C. ranunculi.*

Right: Illustration by Steven Falk in “British Hoverflies” Stubbs and Falk (2002)

Dorsal view of epandrium: 3a Genitalia *Cheilosia ranunculi:* 2i Genitalia *Cheilosia albitarsis*

It seems reasonable to assume that the females that emerged are also *C. ranunculi*. I must admit from a cursory inspection they appear much like *C. albitarsis* females and lack the distinctive features of the *C. ranunculi* males. The front foot shape seems intermediate in shape between those of the males of the two species. However, it seems to me that they are slightly smaller and that their abdomens are more pointed and less broadly oval than *C. albitarsis* females; The lunules surrounding their antennae bases lack the groove which Docskal[3] speculated signified *C. albitarsis* s.s. females and are quite similar to the lunules of what he speculated were female *C. ranunculi* taken from S.W. Germany (see illustration from his paper). The thoracic dorsum was predominantly pale-haired (also a feature of females from S.W. Germany) in contrast to the normally predominantly black-haired female *C. albitarsis*. Perhaps closer scrutiny will reveal more differences. They seem to me to be a valuable resource for an expert. I will keep them as voucher samples,

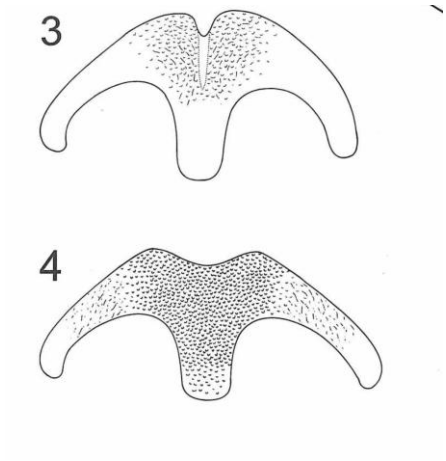

Photo John Leach

Left: Fig.3 Lunule of *C. albitarsis* with central groove: Fig. 4 Lunule of *C. ranunculi* lacking groove

Illustrations from Description of *Cheilosia ranunculi* spec, nov. by Dieter Doczkal (Volucella: 5 2000)

Right: Lunule of a female from the breeding experiment presumed to be *C. ranunculi* showing the lack of a central groove.

Repeating the exercise with other buttercup species, such as Meadow Buttercups, which also occur in drier meadows, would be informative. Similarly, repeating the exercise with Bulbous Buttercup using *C. albitarsis* males and presumed females might show that *C. ranunculi* does not have exclusive use of the plant as a larval food source. Besides this, the larvae of *C. ranunculi* have not been seen, photographed or described. It would also be interesting to find out whether their life cycle is the same as those of *C, albitarsis*; whether they similarly go into diapause until the late autumn/winter; whether they create rot-holes and feed on bacteria or whether they directly consume the bulb. I had hoped to raise a second generation but my hoverfly husbandry was not up to keeping the adult hoverflies alive long enough for egg laying. However, I haven't given up; I will try again with fresh hoverflies; there is plenty still to be done!

References:
[1]Stubbs, A.E., and Falk, S.J. 2002. British Hoverflies. British Entomological and Natural History Society, Reading.

[2]Gibbs, D. 2000. Are there two species confused under *Cheilosia albitarsis* s.l. Hoverfly Newsletter 30: 4-5.

[3]Doczkal, D. 2000. Description of *Cheilosia ranunculi* Spec. Nov. from Europe. Volucella 5: 63-78.

[4]Doczkal, D. 2002.Further presumed host plant relationships of *Cheilosia* Meigen obtained from observing egg-laying females. Volucella 6: 163-166.

[5]Rotheray, G.E. and Gilbert, F. 2011. The Natural History of Hoverflies. Forrest Text, Cardigan, 224 pp.

[6]Rotheray, G.E. 1991. Larval stages of 17 rare and poorly known British hoverflies. Journal of Natural History25: 4, 945-969.

Acknowledgements:
Thanks are expressed to Derek Whiteley for confirming the identification of the bred male *Cheilosia ranunculi* specimens. John Leach is thanked for taking the excellent macrophotographs of the pupae and bred hoverflies used in the article. Deiter Doczkal and Steven Falk are thanked for their kind permission to reproduce figures illustrating features of the adult hoverflies from their papers and books respectively. They and Graham Rotheray are thanked for looking over the article and their helpful suggestions.

Cheilosia caerulescens in Northamptonshire

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On 20th April 2019, I was just finishing examining my garden moth trap at the above address SP811815, when I noticed a Cheilosia hoverfly perched on the book I had been using. I potted the specimen and later examined it. Initially I keyed it out to a member of the Pagana Group in Stubbs and Falk[1] but it failed within the group's key. I had noticed some wing shading, particularly over the cross-veins and remembered that this was a feature of *Cheilosia caerulescens*. I turned to van Veen[2] and it easily keyed out to a female of this species. As far as I am aware, this is the first record of this species in Northants or vice-county 32. I have not recorded another since.

I do have houseleeks Sempervivum spp. in my garden and immediately checked them for signs of leaf damage but could find none. Nor have I found any damage subsequently so that it appears that the fly was a one-off rather than being established in the area.

Habitus of female *Cheilosia caerulescens* showing projecting lower face

Shaded cross-veins of wing.

References:

[1]Stubbs, A. E. and Falk, S.J. 2002. *British Hoverflies: An Illustrated Identification Guide.* 469pp. British Entomological and Natural History Society, Reading.

[2]van Veen, M.P. 2004. *Hoverflies of Northwest Europe: Identification Keys to the Syrphidae.* 254pp. KNNV Publishing.

Meliscaeva auricollis with yellow facial knob

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On 19th June at Yardley Chase, Northants SP841556, I took a hoverfly, which I thought was *Meliscaeva auricollis.* On examining under the microscope I noticed that the face was completely yellow, including the facial knob. Both Stubbs and Falk[1] and van Veen [2] state that this should be black. I re-examined the specimen using both keys to check if I had mistakenly identified it but came to the same determination on the balance of other features. In particular, I noted that the hind edges of the wing were lined with minute black flecks, a feature confined to Meliscaeva and Episyrphus as noted in Stubbs and Falk[3]. (Van Veen treats Meliscaeva as Episyrphus). The alula was broad and triangular and the lunule yellow, contrasting with the black area above it. The attached photos show the habitus, hind edge of the wing and the face of the specimen.

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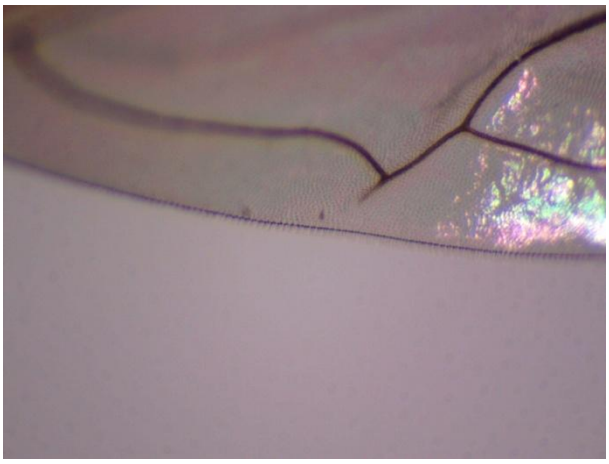
Habitus of *Meliscaeva auricollis*



Hind edge showing minute black flecks

Face showing yellow knob

This is not the only example of this. On 14th July 2019 Kev Rowley also found a similarly yellow-faced example at Lilbourne Meadows Nature Reserve, Northants SP558760. Both specimens have been retained as vouchers.

References:

[1]Stubbs, A. E. and Falk, S. J. 2002. *British Hoverflies: An Illustrated Identification Guide.* P101. British Entomological and Natural History Society, Reading

[2]van Veen, M. P., 2004. *Hoverflies of Northwest Europe: Identification Keys to the Syrphidae.* P95. KNNV Publishing

[3]Stubbs, A. E. and Falk, S. J. 2002. *British Hoverflies: An Illustrated Identification Guide.* P219. British Entomological and Natural History Society, Reading

When to hover, when to chase

Jon Heal

Male *Eristalis nemorum* are often photographed hovering in their distinctive way above a feeding female. I have read several suggestions for this behaviour but my own explanation requires comparison with other *Eristalis* species. First of all, *Eristalis* pairs are rarely seen mating, and from my experience of breeding them in the past, females probably only mate once. Coupling takes place in flight. Only the fittest males - "fittest" in more than one sense - are able to mate. I have never seen evidence that *Eristalis* males hold territories. Nor do males guard females after mating. After they separate physically, they separate for good. However the time for which *Eristalis* pairs couple, usually over 10 minutes in my observations, may prevent other males from interfering when the female is receptive. The male's problem is to find a receptive female of his own species. That probably means one recently emerged and not yet mated. Most insects it sees are not what it is looking for.

July 2019 had many warm days that allowed me to study the behaviour of *Eristalis tenax*. On most days in July, there was direct sunshine on one part of my back garden by 7.30am, marking the arrival of the earliest males. Early in the morning males bask a little in the sunshine, but they rarely visited flowers until later. Their first behaviour was a searching flight, leaf to leaf, and very like the flight of a *Vespula*. I assume the search is for a freshly emerged female. Later in the morning males are more often seen perching on leaves and darting out at passing insects.

The behaviour that seems to indicate a receptive female is a slow flight that allows the male to follow, slightly behind and below the female's flight. If she pauses to feed, the male hovers alongside or may perch nearby. I observed this in my garden a few times, especially on the 11th and 12th July, and always in the morning. Later in the day, males and females fed together on patches of flowers in my garden, especially a shaded clump of marjoram, with hardly any interactions. By late August nearly all *E. tenax* I saw were foraging with few signs of mating behaviour - at least when I was paying attention! Late September onwards was very wet, and there were few *Eristalis* of any species until I had some female *E. tenax* flying indoors searching for hibernation spaces. I had several visitors flying around in the house in the period 9th to 20th October. Their slow buzzing indoor flight inside the house reminded me of their slow summer flight that allowed a male to follow, and possibly mate. I did not see males attempt to mate with a feeding female.
Occasionally they get things wrong. On 25th July a male was repulsed by a *Vespula* worker when it tried to couple.

I suggest the *E. nemorum* behaviour is related. Female *E. nemorum* tend to prefer flat-topped flowers, often purple ones, where males locate them. The male's opportunity to mate is when the female leaves the flower, so they hover above until she moves. Sometimes other similarly sized insects elicit the same behaviour, but mostly they do not. Of course the female may already have mated, and so does not respond. The "bouncing" down of the male, that many of us have seen, seems a ploy to disturb the female off the flower to allow the male to pursue. When two males are both hovering above the female, I have rarely seen any interaction. The chance to compete only comes when she leaves the flower. Mostly the pursuit is going to be unsuccessful in any case.

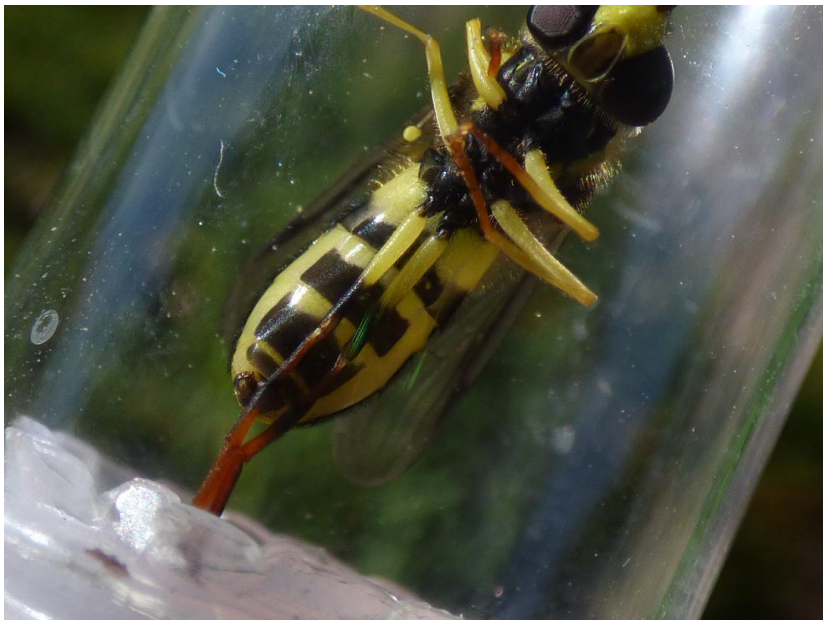
The hovering response of a male *Eristalis nemorum* to a feeding female

Occasionally the response is triggered by wrong species!

(Photos: David Iliff)

Xanthogramma stackelbergi new to Gloucestershire

Xanthogramma stackelbergi was added to the British list in 2012. On 22 June 2019 John Phillips found the first example to have been identified in Gloucestershire at Pope's Hill SO6814. Photographs of his specimen (a male) appear below.



Xanthogramma stackelbergi (male) at Pope's Hill (Gloucestershire). (Photos: John Phillips)