Wyre Forest Study Group

Worcestershire Entomology Day 2011

Insects and Plants - Saturday 19th November 2011

COMPILED BY MIKE BLOXHAM

The inter-relationships between plants and insects is widely documented in the entomological world, although there is still so much that is yet to be discovered. We were pleased to welcome our speakers for the day who were able to provide us with a wide range of different perspectives on this fascinating topic. About 60 of us were present to enjoy the day in the new Wyre Forest Discovery Centre and a summary of the talks is provided here.

Plant Galls - a fascinating world in miniature
Margaret Redfern

Plant galls illustrate today's theme of 'Insects and Plants' perfectly. The insect (or other galler) is a highly specialised herbivore completely dependent on its host plant, causing a growth that always starts in young plant tissues. First, some background on galls: what is a gall? where does one find them? and, briefly, what is their structure?

The bulk of the talk describes the wide variety of galls, illustrated using photographs of galls from the simpler to the more complex. Most of the examples included are insect galls, but some are caused by gall mites (treating them as surrogate insects); and a few shown are caused by fungi so as not to neglect them altogether.

There are three main groups of galls:

- Witches' brooms, virescences and solid galls caused mainly by fungi and bacteria, plus a few insects and mites. These may appear complex but, in all, the normal organs of the plant can be recognised.
- Open galls, which vary in structure from simple erinea, rolls and folds, to pouches and bud galls quite complex in structure; all have a permanent opening to the outside. Most of these are caused by mites and insects.
- Closed galls with chambers inside; these can also be simple or highly elaborate. They are caused by a wide range of organisms including nematode worms, beetles, moths, sawflies, gall midges, tephritid flies and cynipid wasps. Some of these cause structures that are found nowhere else on the plant.


Fig. 1. Witches' broom on birch *Betula* caused by a fungus *Taphrina betulina* Tom Higginbottom


Fig. 2. Erinea on beech *Fagus sylvatica* caused by a gall mite *Aceria nervisequa* Tom Higginbottom

The birch witches' broom (Fig. 1) is caused by a fungus *Taphrina betulina*. The Tassel Gall on rush is caused by *Livia juncorum* and is an example of a virescence. And a related fungus *Taphrina pruni* causes Pocket Plums on Blackthorn.

Several examples of open galls are included. Erinea on beech leaves (Fig. 2) are caused by gall mites *Aceria nervisequa*, and thickened leaf rolls and folds, are caused on Wych Elm by woolly aphids *Eriosoma ulmi* and on oak by the gall midges *Macrodiplosis pustularis* and *M. roboris*. Pouch galls also have permanent openings and range from simple pustules, e.g. on whitebeam (*Eriophyes arianus*), to more complex pouches, e.g. on lime (*Eriophyes tiliae*) and on beech (*Mikiola fagi*). Bud galls range from big buds caused by gall mites (e.g. on Hazel caused by *Phytoptus avellanae*), to rosettes caused by gall midges (on willow caused by *Rabdophaga rosaria*, and on Yew, *Taxomyia taxi*) and the Cigar Gall (*Lipara lucens*) on *Phragmites*.


Fig. 3. Bean galls on Crack Willow *Salix fragilis* caused by a sawfly *Pontania proxima* Tom Higginbottom

Closed galls contain one or more chambers, with each containing a larva (or several). Some are simple swellings of callous tissue, e.g. sawfly galls on willows, bean galls (Fig. 3, *Pontania proxima*) and pea galls (*Eupontania* species). More complex woody galls in thistles are due to the tephritids *Urophora stylata* and

This article is an extract from the Wyre Forest Study Group annual Review 2011

Fig. 4. Common and Silk Button Spangle Galls on oak *Quercus robur* or *Q. petraea* caused by gall wasps *Neuroterus quercusbaccarum* and *N. numismalis* Michael Chinery

U. cardui. The most complex are cynipid galls. Examples range from *Diplolepis* galls on wild roses, including the 'sputnik' gall of *Diplolepis nervosa* and the Bedeguar or Robin's Pincushion (*Diplolepis rosae*), and *Liposthenes glechomae* on Ground Ivy. The most complex gall wasp galls are those on oak with sexual and agamic generations alternating each year: spangle galls (Fig. 4) on leaves (caused by *Neuroterus quercusbaccarum* and *N. numismalis*), the Oak Apple (*Biorhiza pallida*), and non-native heteroecious species with the agamic gall on native oaks and the sexual gall on the introduced Turkey Oak (the Marble Gall *Andricus kollari*, Knopper Gall *A. quercuscalicis* and Hedgehog Gall, Fig. 5., *A. lucidus*).

Fig. 5. Hedgehog gall on oak *Quercus robur* or *Q. petraea* caused by the gall wasp *Andricus lucidus* Michael Chinery

Galls often contain organisms in addition to or instead of the gall causer: parasitoids, inquilines and predators, and they may also be attacked from the outside by birds and small mammals. Often a small community is associated with a gall. Just two communities are shown, the simple one characteristic of the root gall (Fig. 6) of *Biorhiza pallida*, and the much more complex one in the Oak Apple (Fig. 7) of *B. pallida*.

Finally, advantages and disadvantages of gall formation were discussed. Galling has evolved independently

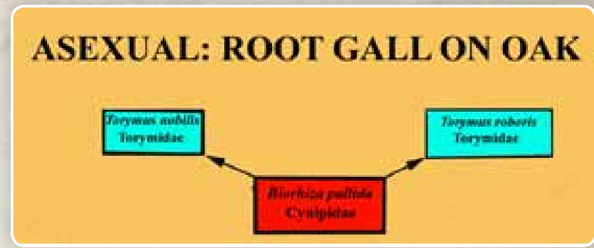


Fig. 6. Simple food web in root gall of the gall wasp *Biorhiza pallida*

in a wide range of unrelated insects (and other organisms), which suggests there are advantages. Once a gall has developed, food and water supplies are assured and the larvae inside are protected from an adverse climate and from many predators and parasitoids. But only about 6% of herbivorous insects worldwide live in galls, suggesting there must be a downside. Gall causers need to show extreme specialisation in order to survive on a host species; they must be closely adapted to the morphology of the plant and synchronised with its development, and so well adapted to it that they can cope with any toxins produced. Adaptation to one species or to a few related plants may mean that a galler cannot quickly turn to an unrelated plant should a catastrophe wipe out the normal host. And gall causers need to be small, to fit inside a leaf, stem or seed of the host, and this limits numbers of eggs produced and therefore the rate of population growth.

Fig. 7. Complex food web in the oak apple of the gall wasp *Biorhiza pallida* (Colour key for the food webs in Figs. 6 and 7: gall causer, red; parasitoids, pale blue; inquilines, green.)

But gall formation is not an evolutionary dead end. Evolutionary studies show that gall-causing can be lost from a group of related gallers, with some species no longer capable of causing a gall. They may have evolved parasitic habits or become inquilinous or even evolved into more generalised free-living herbivores.

Where would we be without Aphids?
Roger Umpelby

We were extremely fortunate that Roger Umpelby was able to give this fascinating lecture. His initial remarks reinforced the general perception that aphids may be all around us but very few people have been moved to study them. There could be many reasons for this. The insects themselves are not often attractive in a general sense and they are easily overlooked unless spotted on garden plants or commercially grown crops, where they can do much damage. They have therefore tended to be mainly of concern to applied entomologists charged with the task of studying and devising control strategies for them.

The Aphids fall in the large insect order Hemiptera (Suborder Homoptera) wherein can be found the large super-family Aphididae (4000 species worldwide, 500 UK species), containing the insects featured in the lecture.

In Britain 30 species are major crop pests and over half of the known plant viruses are transmitted by aphids. Systematic study in every sense is therefore important if the applied entomologist is to make progress in the face of many complexities.

Study of life cycles has been a major field of activity because complex features of aphid lifestyles confront the worker at every turn. Some can be highly host specific. The insects may be alate or apterous and parthenogenesis is common. Summer populations are usually entirely parthenogenetic females, with sexual females and males only appearing in autumn in most species. Host alternation is not infrequent; heteroecious species normally lay eggs on their winter hosts. Eggs hatch into asexual females in early spring and migration to the summer host takes place later in early summer. Host choice is predetermined at birth.

There has been considerable study of host location strategies. Aphids tend to be weak passive fliers and wind strength and air movements play important general roles in transport to food plants, but hosts are more precisely located by factors such as appreciation of colour, plant aromatics, presence of existing colonies and by physical contact when stylets are used to probe potential hosts.

Of seminal importance is the knowledge that all aphids feed on sap. Listeners would be aware that the characteristics of plant growth normally see the sap flowing under some degree of pressure and this is important for aphid feeding processes. Many aphids tap the phloem where the pressure may be adequate and they can also change feeding positions as necessary. They can prevent wound healing by production of chemicals preventing sap solidification. In considering this penetrative feeding, it has to be borne in mind that a number of aphids carry persistent viruses during their lives – a matter of concern in agriculture.

Aphid attack on plants may be obvious, but is not always so. Most often honeydew and sooty moulds may be noted and leaf/needle discolouration is often visible. Loss of vigour with wilt can often be noticed and severe attack can produce leaf distortion or shoot death. Galls and calluses can appear with some species, and disease can be introduced, either directly in the case of viruses through the feeding process, or indirectly in the case of fungi or bacteria which enter the plant through aphid-feeding wounds.

The general environmental impact is evident in the negative direct effect on nearly all plants hosting aphids. Excessive honeydew is in evidence on occasions (when the public complain having parked cars under certain trees!). A most notable (and little appreciated) characteristic of the aphids is that they are extremely effective in plant/protein conversion.

The foregoing information led naturally to consideration of the reproductive capacity of aphids. Studies have suggested that in good conditions an adult might produce some 20 young per day for three weeks. The young can mature at 11 days. It is therefore possible to see that, in theory, a single individual might have several hundred thousand direct descendants during its lifetime of perhaps only six weeks. Indeed a very effective conversion of plant to protein!


Silver Birch aphid giving birth — Roger Umpelby

The abundance of aphids ensures that they have many natural enemies. Most notably involved in their destruction are hundreds of other insect species. The Braconid parasitoid family (Aphidiidae) is virtually entirely devoted to their demise. Not all insects devour or destroy them; a significant number, especially ants find their honeydew most valuable and some ants will 'farm' favoured aphid species protecting the aphids from attack by other insects.

Ant milking aphid for honeydew Roger Umpelby

The speaker went on to consider some aspects of aphid structure in greater detail and drew our attention to some special features they possess. The presence of longer hind legs on many species was noted - because some species feed with the head down. The projecting siphunculi were capable of emitting an alarm pheromone when the aphid was attacked and waxy secretions that might impede the movements of an attacker. The alate sexual aphids will fly to winter host plants and lay eggs in suitable locations. All these eggs are similarly small black and shiny. The summer generations are parthenogenetic and gregarious on shoot tips, stems and leaves.

We were given actual examples of some aphid species which readily demonstrated the lifestyles previously mentioned. Lettuce Root Aphid (*Pemphigus bursarius*) males and females mate and lay eggs that overwinter on poplar leaf buds. In the spring the newly hatched aphids feeding on the leaf petioles cause galls to develop around the aphids. Asexual breeding continues inside the gall until, at a suitable time in the spring, alate females emerge and find a secondary host (frequently lettuce) where parthenogenetic reproduction takes place and the progeny attacks the roots of the plant. Another gall inducer the Elm Balloon Gall Aphid (*Eriosoma lanuginosum*) also takes advantage of protected development within a gall. Pine and spruce aphids (often familiar to those with garden conifers as pineapple galls) were mentioned.

Examples of aphid parasites include numerous *Aphidius* species and a *Praon* species (Apidiidae). Hoverfly larvae, lacewing and ladybird adults and larvae, anthocorids, and some predatory midge larvae are among the many invertebrate predators of aphids. Pictures of mosaic virus effects were shown.

Aphids inside opened Elephant Balloon Gall on elm Roger Umpelby

Finally the speaker asked us to consider the consequences if aphids were absent. There might be more healthy plants in the wild and under cultivation and we might be able produce a lot more food from the existing cultivated areas. We would probably use fewer pesticides and smaller amounts of these substances generally. However, biodiversity might well suffer because the aphids had their own particular value in the food chains of so many other animal species.

A Fresh Look at Micro Moths and Plants
Tony Simpson

Tony Simpson again gave the meeting the benefit of his considerable experience gained from study of Lepidoptera at all stages of their life cycles. He continues to be a most valuable mentor for aspiring lepidopterists and here he demonstrated further how lives of moths and plants are intimately connected and a dedicated study of both can produce rewards on many fronts.

A significant number of moths have only one food plant and will not touch any other species - even if it is a close relative of the host species. Such a species is *Lampronia capitella* which likes wild Red Currant but will not touch Black Currant (see photograph).

Lampronia capitella on Red Currant Tony Simpson

Others have a certain amount of food plant flexibility. *Yponomeuta cagnagella* is usually associated with Spindle, but can also be found on evergreen *Euonymus*. A feature of some species dedicated to one or two food plants can be their obvious presence in partial defoliation where larvae are abundant. This defoliation can be accompanied by general web – spinning with larvae feeding gregariously. This is the case with the last named species and the lifestyle is also seen (sometimes with spectacular results) with *Yponomeuta rorrella* on *Salix* species. We saw pictures of imago, larva and web. This species can be extremely abundant and has increased its range in recent times. Many species can take advantage of several food plants. Knowledge of egg characteristics can be valuable to the worker when a general search of vegetation is in progress. We saw ova of Blue-bordered Carpet on Blackthorn.

The entomologist has to be especially aware of seasons and it is possible that many species considered uncommon might be found to be frequent if workers were alert for them at the right time. Blossom Underwing is a moth of March and April. It has characteristic larvae and is also a web spinner on oak. We learnt also that some food plants may be more easily attacked early in the year because the defences (chemical etc.) are not yet fully developed. Another web-spinner on a variety of food plants is *Diurnea fagella* - the larva is a slow feeder from May until October (the speaker found one during the study group visit to Rock Coppice on October 8th 2011). We saw pictures of the larva and also the very variable imago.

Feeding webs which bring together edges of leaves can be seen in *Acleris kochiella*. The larvae of this variable micro moth are found only on *Ulmus* (elm). A scarce early flying moth with similar habits, the Light Orange Underwing *Archieris notha* may be found on Aspen. We saw the spinning and characteristic larva. The uncommon *Nothris congressariella* may be found in spun leaves of Balm-leaved Figwort. Sometimes stems are spun together, as in the case with the larvae of a much more widely distributed micro moth (*Agonopterix assimilella*) on Broom.

In recent times many more entomologists have become accustomed to examination of mines on vegetation. This is a valuable skill, helping workers to study the invertebrate populations on sites. It certainly works for some Diptera (true flies) and the lepidopterist has to be assiduous in study to learn how to attribute mines to the correct insects - in fact breeding out is a very useful activity to put the mind at rest in some cases. Tony Simpson showed a sequence of different mines,

Cameraria ohridella mines in Horse Chestnut Tony Simpson

beginning with the vacated mine of *Lyonetia clerkella* in cherry and an occupied mine of *Stigmella tiliae* in Small-leaved Lime. We saw mines of *Stigmella ulmivora* and *Stigmella viscariella* in elm. *Ectoedemia arcuatella* mines were seen on Wild Strawberry.

Whilst a number of mines were characteristic and could be recognised immediately from one side of a leaf, it was often valuable to examine both sides because diagnostic features were often also present there. Mines of *Phyllonorycter nicellii* from the upper side and underside of a Hazel leaf were shown, as were mines of *P. kleemanella* in Alder.

A number of mining species behave in a more complex way by developing initially in a conventional leaf mine and then undergoing changes when the larva vacates the mine to construct neat rolls or cones from the leaf. These are bound with silk and within them development is completed. These 'cones' can be diagnostic for species. The meeting saw the mine of *Caloptilia cuculipennella* in Wild Privet, the feeding 'cone' of a larva and an old 'cone' with the emerged pupal case protruding.

We returned to visit another set of distinctive mines. The larva of *Bucculatrix ulmella* feeding on oak produces a twisting mine close to the midrib and 'windows' are often conspicuous.

Larvae of *Coleophora serratella* mine and also produce a small hole in an elm leaf; the section thus excised being used to construct a mobile case within which the larva feeds during the latter stages of development. The speaker showed pictures of these stages and also the case of *Coleophora alnifoliae* feeding on Alder. A much scarcer insect *Coleophora genistae* feeds on the leaves of Petty Whin (*Genista anglica*). We saw the plant and also the feeding case.

A small group of moths with special attributes concluded the lecture. We saw a larva of *Endothenia gentianeana* in a seed head of Teasel - a spiny retreat for this moth!

It was also appropriate to conclude with some species on the move - always of interest to entomologists. Small Ranunculus, has been steadily increasing its territory northwards and we saw its larva on Prickly Lettuce. Most notorious of all and a possible cause for some general concern was *Cameraria ohridella* (see photograph). Tony Simpson spoke about the explosive spread of this species showing several pictures of the variable but unmistakeable mines on Horse Chestnut. Other moths now doing well are often associated with horticultural plantings. We saw mines of *Phyllonorycter leucographella* in *Pyracanthus* and mines of *P. platani* in Plane. Another introduction - the Light Brown Apple Moth (*Epiphyas postvittana*) is now widespread; It has multiple food plants and the imago can appear in a bewildering variety of forms.

Tony Simpson rounded off his lecture with some general comments on mines, reminding the audience that even at the time of this event, they could go into the forest and see 'green islands' on leaves. It appears that mining larvae of some species - especially on oak and beech - can work in such a way that they isolate leaf sections and prevent withdrawal of chlorophyll during autumn. He concluded by showing a mine of *Stigmella tityrella* on beech in one such 'green island'.

The Effects of Urbanisation on Bees and Hoverflies.
Adam Bates

Dr. Adam Bates has had considerable recent experience in studying insect presence on inner city sites - most notably the Birmingham Eastside complex. It was therefore logical that he should form part of a team that undertook another specialized study of pollinating insects and their presence on a variety of smaller sites in urban, suburban and rural sites across Birmingham.

The emphasis was placed on pollinating insects because there is worrying international evidence that a number of factors appear to be reducing their numbers. Amongst these, urbanization is assumed to play an increasingly important part and the study sets out examine the effect of differing levels and intensity of urbanization across the City of Birmingham on pollinators.

The authors point out that studies on the effects of urbanization in this context are valuable. Whilst related surveys on rural/agricultural land are seen as of primary importance because of consequences for commercial food production, the status of the pollinators in urbanized areas is also significant. Knowledge of the species richness and basic population strength of urban pollinators may have considerable bearing both in assessing the overall strength of the resource of these insects and also the potential that the city might act as a reservoir for reinforcement of general populations in certain circumstances. Conservation of urban pollinators may indeed be very important not only within the city, but in this wider context.

The Sample Sites
After considerable debate and study of local maps, official classifications and ecological designations relevant to selection, 34 sample sites with a basic degree of similarity (churchyards and cemeteries) were selected along a gradient of urbanization. It was considered that these had the not inconsiderable advantage of being the most convenient and accessible areas for this particular type of survey.

The local context of each sub-site was also assessed with regard to a selected set of variables. The area of built landscape and garden in the immediate proximity of each chosen subsite (expressed as a percentage) was recorded.

General physical factors such as altitude and exposure were recorded as were characteristics of the vegetation (flowering species richness and abundance) on each sub-site.

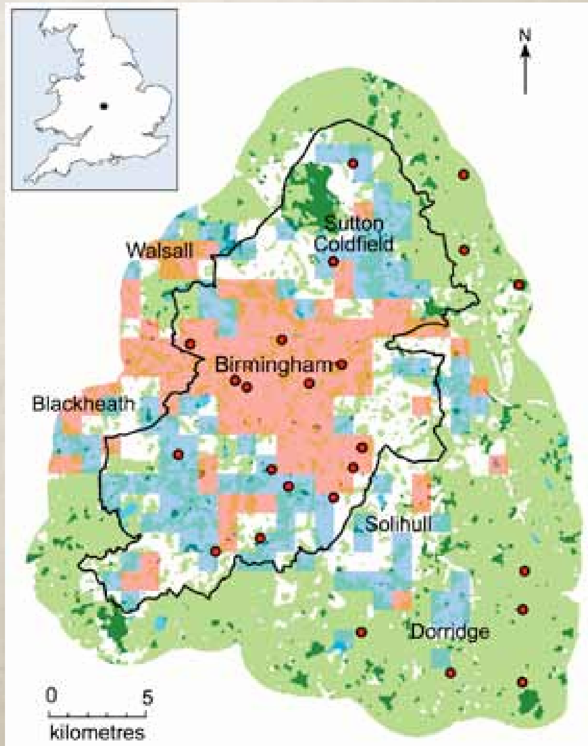


Fig.1. Distribution of the 24 sites

Field Methodology

The insects were sampled using water-filled pan traps (blue yellow and white to attract the insects) and were set out for continuous 48 hour periods on five separate occasions during periods of specified weather conditions. The methodology was supplemented by netting and hand-search of selected areas of vegetation on a standardized basis on given dates. Some larger pollinators (honey bees and bumble bees) were quite readily counted in these surveys.

The experimental design was affected by a number of factors, such as disturbance by animals. Human disturbance was, as might be expected, a problem and the original 34 sites were eventually reduced to 24, ten being lost because of unacceptable interference levels (see Fig. 1).

Results

Pollinating insect counts

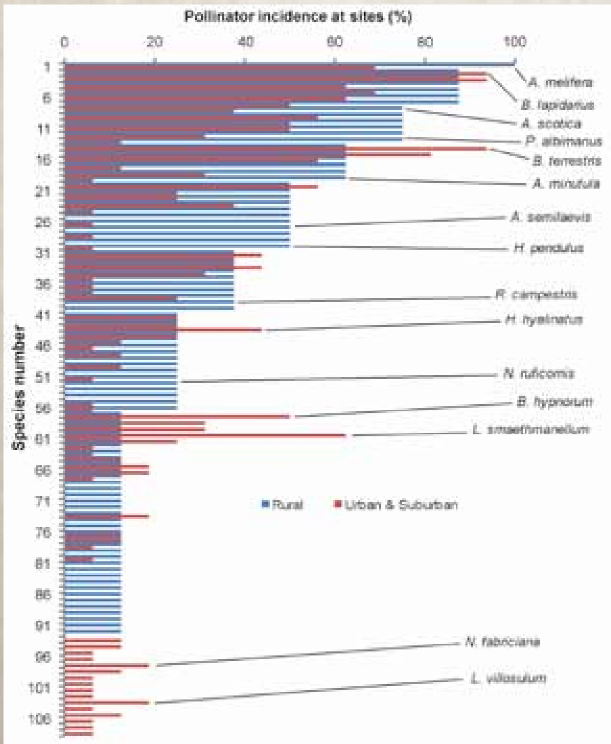
The study accumulated 1249 individual bees (58 species) and 714 individual hoverflies (50 species).

Analysis

Multivariate analysis was applied to the results so that the influence of diverse factors could be considered and the significance of findings could emerge.

(The reader is reminded at this juncture that an adequate description of the statistical procedures involved in reaching conclusions could not be given by our speaker in the time available and what follows is an abbreviated summary of findings. M.Bloxham)

Fig.2.



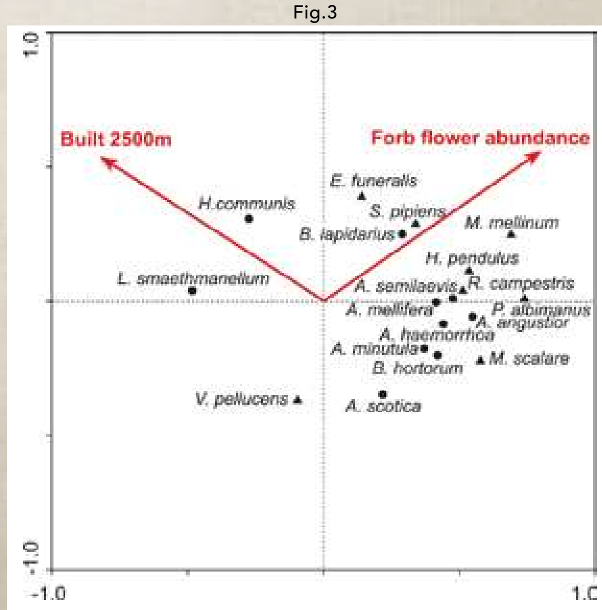
The raft of procedures used did not decisively allow conclusions at a number of levels; however some findings, especially with regard to species presence, were pretty clear. Analysis of altitude data showed a negative relationship with pollinator richness and exposure data was negatively associated with total pollinator abundance and total richness. There was a negative response to urbanization intensity by pollinators as a whole - both in terms of numbers and diversity. It was not easy to detect any decisive difference between 'urban' and suburban' sites on the continuum, but it did seem that sites more 'rural' in nature were favoured (see Fig. 2).

Pollinator assemblages studied varied along the urbanization gradient with some positively associated with urban and suburban settings but the majority demonstrating negative association. Certain site factors-most notably quality of habitat (in particular floristic diversity) had a positive effect on general assemblage quality (see Fig. 3).

It was apparent that highly specialized and rare species were infrequent – high levels of human activity were probably responsible for this. These levels did however suit the few urban specialists such as those nesting in loose mortar!

Certain pollinators seemed less affected by urbanization - notably more mobile strong flying species such as the Honey Bee (*Apis mellifera*) and the Red-tailed Bumble

Fig.3



Bee (*Bombus lapidarius*). Others such as the very common hoverfly *Helophilus pendulus* required at least some damp habitat present on, or adjoining a site and would probably be absent if this was not available.

The influence of the site habitat types on the pollinator populations was significant in a number of different ways. High suburban garden percentages in site vicinity were not reflected in higher pollinator presence in samples. This may well have indicated that local garden plantings followed a typical trend, with horticulturally modified introductions not necessarily attractive to native pollinating insects.

Conclusions

Local habitat quality appears to be a key determinant in supporting pollinator assemblages of bees and hoverflies. Fewer individuals and lower diversity were also characteristics of urban and suburban sites - 'rural' sites being usually preferable. The development history of many urban sites has been very different. It is also very probable that other factors were involved in determining the strength of pollinator assemblages and that a wider range of habitat types in urbanization require in-depth study to provide a more complete picture of pollinator status in conurbations.

Plant and Insect Inter-relationships in Focus

John Bingham

John Bingham's excursions into the Forest in recent times have seen the accumulation of increasingly large amounts of invertebrate data. Readers will have noted his regular contributions to the WFSG Review – especially the important one on longhorn beetles (2009). His ongoing study of larger Coleoptera is currently most valuable, because in the past we knew Kevin McGee was also likely to record and photograph, but recent times have seen him engaged elsewhere.

John was also heavily involved in advising on forest management both for the benefit of wild flowers and also the habitat structure for insects. He is regularly monitoring a number of plant species known to have value both as hosts for feeding invertebrate larvae and also as sources of nectar. He is delighted to see that there is already evidence that recent management activity has been positive in this respect.

One most important development seems to be that work is improving the quantity and quality of nectar sources for insects in general. Above all there has to be some continuity of these resources. We saw a number of insects visiting spring flowers. Coltsfoot hosted the large parasite fly *Tachina ursina*. Sallows were visited by *Eristalis* species and Bugle offered opportunities for early flyers like *Anthophora plumipes* (Hairy-footed Flower Bee). The later spring flowers such as Wild Garlic received visits from *Bombylius major* (the Large Bee Fly - see photograph). Pearl-bordered Fritillary was active over Bluebells and *Nomada flava* (probably alert for passing *Andrena* bees) was seen on Forget-me-not. Early flowering hawthorn saw a good record with a visit by *Molorchus minor* (an uncommon longhorn beetle). This introduced species may be increasing its range on conifers and is one of a set of beetles which might be usefully monitored in Wyre. Good showings of Bell Heather attracted Small Pearl-bordered Fritillary and the heathland specialist bee *Andrena lapponica* was noted visiting Bilberry.

Perhaps some of the most valuable nectar sources are those available over longer periods of time. John has studied Wood Spurge in some detail. It flowers from April to September and may attract visits from a wide range of insects. Amongst those noted were spider-hunting Pompilid wasps (males especially visit for nectar), the longhorn beetle *Rhagium mordax* and the bumble bee parasitoid *Conops vesicularis* together with several bumble bee species. Pearl-bordered Fritillary (enjoying an excellent year) was also in evidence. John has noted that Wood Spurge is widespread in the Wyre Forest but is quite thinly scattered. He suggested that the plant might host the larvae of Drab Looper moth, yet to be discovered locally on Wood Spurge. Sensitive management might encourage proliferation of the plant - providing better opportunities to answer questions such as this.

High summer sees the importance of a familiar set of plants as nectar sources. A variety of clovers, comfrey and thistles (especially Creeping Thistle) can be relied on to attract a wide range of insects. Bramble flowers are of special importance, having attracted several different longhorn beetles during the years of

Large Bee Fly *Bombylius major* John Bingham

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John's observations. Here we saw the very common *Grammoptera ruficornis*. Umbellifers such as Hogweed are also well worth watching. The observer will see the flowers used for courtship and mating (*Rhagonycha fulva*) and may also see the Common Cardinal beetle *Pyrochroa serraticornis* (see photograph) or even the elusive Bee Chafer *Trichius fasciatus*. The latter is said to be nationally infrequent but not rare. This is yet to be found in the Wyre Forest, although it occurs in Mortimer Forest. The abundant oaks are worthy of routine examination because they may not only provide evidence of elusive butterflies (Purple Hairstreak larvae) but provide the observer with a range of insects highly adapted to certain lifestyles on host plants. John's picture of the Acorn Weevil (*Curculio nucum*) was a case in point. Fungal fluxes and sap runs on such trees are of interest throughout the year. They may be visited by beautiful flies such as *Sargus bipunctatus* (see photograph). This is also to be seen where animal dung is found – as are 'Dor' beetles (*Geotrupes* sp.)

The speaker had highlighted the need for sensitive and adequate forest management especially open spaces. It is beneficial to the entire wildlife community not only in providing a wider range of habitat types in areas where monoculture has been too prevalent, but also in facilitating the assessment of biodiversity in the area as a whole.

TO CONCLUDE THE DAY Brett Westwood thanked the speakers (see photograph below) for their quality presentations, and congratulated the Wyre Forest Study Group committee for arranging such a stimulating day. Rosemary Winnall thanked Brett for chairing the event with his normal professional flair, and Mike Bloxham for carefully documenting the proceedings. The Entomology Day had been a great success and we look forward to the next in November 2012. As someone said at the end - "I'm going away buzzing!"